THE EVALUATION OF STUDENT PERCEPTIONS OF ARTICULATION AND CTE CLASSES ON STUDENTS WITH AND WITHOUT SPECIAL NEEDS

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THE EVALUATION OF STUDENT PERCEPTIONS OF ARTICULATION AND CTE CLASSES ON STUDENTS WITH AND WITHOUT SPECIAL NEEDS

Jane S. Robinson

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VITA

Jane S. Robinson, daughter of Buren Lamar and Marvie Lemerle (Cato) Sellers, was born May 25, 1956, in LaFayette, Alabama. She earned a Bachelor of Science degree in Education from Auburn University (1977). Upon graduation, Jane was employed as a special education teacher in the Auburn City Schools in Auburn, Alabama. She entered the master's program at Auburn University and earned a Master of Education degree in Special Education in 1979. During her teaching career of seventeen years, Jane taught students with disabilities (in the exceptionality areas of learning disabilities, mental retardation, and emotional disturbances) at the elementary, middle, high school and post secondary levels. She began the doctoral program in 2002. Presently, she is a Related Vocational Coordinator for the Troup County School System in LaGrange, Georgia. She married Dr. Cecil Eugene Robinson, Jr., son of Dr. Cecil Eugene and Helen (Blankenship) Robinson, on August 28, 1977. Jane has three children, Heather (Robinson) Spitz, Cecil Eugene Robinson, III, and Kimberly (Robinson) Babin. She is the proud grandmother of Brianna Elizabeth Spitz and Randall Mark Spitz, III.

DISSERTATION ABSTRACT

THE EVALUATION OF STUDENT PERCEPTIONS OF ARTICULATION AND CTE CLASSES ON STUDENTS WITH AND WITHOUT SPECIAL NEEDS

Jane S. Robinson

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The ultimate test of schools is the success achieved by graduates. Research has documented that young adults with disabilities are often unemployed, underemployed, isolated, and in trouble with the criminal justice system (Meisel, Henderson, Cohen, & Leone, 1998). The increased emphasis on student outcomes and enhancing transition from school to work, especially for students with disabilities, has become a recognized priority for educators since the implementation of the Individuals with Disabilities Education Act (IDEA) (P.L. 101-476) in 1990, the 1997 Amendments (P.L. 105-17) and its reauthorization in 2004 by President G.W. Bush. In addition to IDEA, the Carl D. Perkins Career and Technical Education Improvement Act of 2005 addressed the needs of students with disabilities and defined career-technical education as organized educational programs offering sequences of courses directly related to preparing

individuals for paid or unpaid employment in current or emerging occupations requiring other than a baccalaureate or advanced degree (U.S. Dept Ed). Developing a highly skilled workforce to keep America competitive in the global economy and providing lifelong learning for the workforce is essential.

Educators have investigated strategies that would close the gap between academics and employment. Meaningful educational options have been developed that facilitate the successful transition from school to work. This paper addresses one such strategy, the use of articulation between secondary and postsecondary institutions.

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I. INTRODUCTION

The effectiveness and impact of a seamless transition from secondary schools to post secondary educational opportunities has received national attention since research has documented that students with disabilities lag behind their peers when compared on school (graduation rates) and post school (post secondary attendance, and employment rates) achievement indicators (Blackorby & Wagner, 1996). The number of students with disabilities entering post secondary education is increasing (Eckes & Ochoa, 2005). Between 1991 and 1996, freshmen who reported having a disability increased by more than 10% (Thomas, 2000). Transitioning from high school to higher education is difficult for all students, but especially challenging for students with disabilities (Madaus, 2005). The question is what dimensions of students' secondary experiences contribute to successful transitions to post secondary options. The research available is limited and outdated, but it appears that there is a missing link when students transition from high school to post-secondary education. In today's workforce it is essential that students obtain additional training or education beyond high school in order to increase their employment options. For students with disabilities transitioning successfully to postsecondary programs is crucial, and current strategies designed to assist in this transition process need to be evaluated.

Currently, attention is focused on how high school programs can foster successful transition to post school education, employment and independent living. A study from eight states that evaluated students with disabilities documented that 51% of the students exiting in 1994/95 required alternative education services to complete their basic secondary education and 80% required further case management to achieve their employment, continuing education, and independent living goals (Benz, Lindstrom, & Yovanoff, 2000). Student's secondary educational experiences have offered limited success to successful transition to post secondary educational programs, employment, or independent living.

Factors associated with secondary and post secondary outcomes have been studied. These factors involve the experiences of students' secondary education that have contributed to success in high school and improved postsecondary outcomes. Questions regarding whether secondary and transition programs increase positive secondary and postsecondary outcomes are critical to educators. Are these services beneficial to students? Do students who receive these services find them helpful and meaningful? Researchers suggest that certain programmatic factors contribute to better post secondary employment and educational outcomes for students with disabilities (Benz, Yovanoff, & Doren, 1997; Blackorby & Wagner, 1996; Halpern, Yovanoff, Doren, & Benz, 1995; Wagner, Blackorby, Cameto, & Newman, 1993; Wehmeyer & Schwartz, 1997).

Programmatic factors that impact postsecondary employment and education outcomes for students with disabilities include: (a) participation in vocational classes, (b) participation in paid work experience, (c) competence in functional academics, (d) participation in transition planning, (e) graduation from high school, and (f) absence of

continued instructional needs in academic, vocational, and personal-social areas after leaving school (Benz, et al., 2000). Participation in career technical classes that provide occupationally specific instruction during the last two years of high school is essential in enticing students to stay and complete their secondary education.

Participating in paid work experience in the community during the last two years of high school is also beneficial to students with disabilities completing high school and transitioning into post secondary options (Benz, et. al., 1997). Research has also highlighted the importance of students being competent in functional academics, community living, personal-social skills, vocational skills, and self-determination skills (Blackorby & Wagner, 1996; Halpern, 1993; Thoma & Getzel, 2005). It has also been shown that students who participate in transitional planning and assist in developing their plan of action for high school and beyond have a better chance of successfully transitioning from secondary to post secondary options (Eckes & Ochoa, 2005). Students who graduate from high school and do not require additional or continued instructional needs in functional academics, vocational, or personal-social areas are more likely to experience successful transitions to postsecondary options.

Research has also identified organizational factors that have been credited with assisting smoother transitions and better outcomes for students with disabilities (Benz, et al., 2000). The use of written interagency agreements between schools and adult agencies to provide structure for the collaboration of transitional support has a strong impact on the successful transition of students from high school to post secondary options (Hasazi, Furney, & DeStefano, 1999). Providing key positions funded jointly by schools and adult

agencies to deliver direct services to students in transition has also been identified as essential to supporting successful transition of students with disabilities (Kohler, 1993).

Purpose of the Study

One purpose of this study is to examine a strategy, articulation, utilized by the technical colleges in the state of Georgia to promote the transition of students from secondary education to post-secondary education. Articulation is the coordination of courses and associated credits that can be earned at both the secondary educational level and at the post-secondary educational level. Through the use of articulation agreements established between regional technical colleges and local secondary school systems, students are encouraged to transition from secondary programs at the high school level into post-secondary programs at the technical college. Articulation of courses reduces duplication of coursework and assists students to complete training programs at the post-secondary level and move into the workforce. The theory behind the articulation agreements is that the articulation of courses between the high school and technical college will blend the educational experience, allowing students to be exposed to instruction that is in alignment with courses offered at the post-secondary institution. The goal of articulation is to assist students in making a smooth transition from high school to postsecondary education.

Another purpose of this study is to evaluate the effects of an intervention, the articulation workshop, piloted by West Georgia Tech Prep Consortium. Although articulation agreements have been in place and utilization of articulation has reduced duplication of coursework required to complete programs of study at the post-secondary

level, there is still limited student participation. In an effort to increase student participation in articulation of courses, a workshop on articulation was utilized by the consortium. The goal of the workshop was to provide students with information regarding articulation and promote the use of articulation of courses between the secondary and post-secondary educational level.

Research Questions

Specifically, the study will investigate the following questions:

1. Are there differences between students with and without disabilities in their understanding of how articulation works prior to the articulation workshop?
2. Do student demographics impact students' perception of the importance of career technical programs after participating in the articulation workshop?
3. Do student's perception of articulation change after participating in the articulation workshop?
4. What did participants in the articulation workshop know about articulation one year after the workshop?

Significance of the Study

This study provided an overall assessment of current students' perceptions of the benefits of articulation and its perceived benefits to the students' future goals. In addition, the data provided by the survey was utilized in the evaluation of the workshop, examining the effectiveness of the workshop and the knowledge provided to the students regarding articulation. A comparison of the relationship between pre/post surveys of the

participants of the articulation workshop allowed a measure of the workshop's effectiveness. This study contributes empirical information to the national concern regarding the importance of effective secondary transition practices by examining student and program factors that provide support for a seamless transition to post-secondary programs. Finally, by exploring students' perceptions of the relevance of these services, improvement in service delivery can be addressed.

The results of this study will provide guidance to the West Georgia Technical College Consortium in the planning and implementation of future intervention efforts to increase student knowledge regarding articulation and its benefits. This study will provide documentation to ensure that students acquire quality and effective knowledge regarding the benefits of articulation of courses from secondary education to post-secondary educational programs.

Limitations of Study

Several limitations of the current study should be considered when interpreting the results reported. First, the students who participate in the surveys come from high schools within the west Georgia area. This condition limits the ability to generalize from this sample to a larger population. Therefore, the findings of this study may not generalize to other areas of the country. Second, the survey used in this study is based on self-report measures. These measures depend on the participant's ability and willingness to accurately and honestly respond to questions. Therefore, some possibility exists that the participants' reporting will not be a true reflection of knowledge regarding articulation and its benefits. Finally, this study's experimental group is limited to only

one type of class that would articulate, mathematics. This condition limits the ability to generalize from this sample to other classes that would articulate to the technical college.

Definition of Terms

504 Plan A 504 plan is a legal document falling under the provisions of the Rehabilitation Act of 1973. It is designed to plan a program of instructional services to assist students with disabilities who are in a regular education setting. A 504 plan is not an Individualized Education Program (IEP) as is required for special education students. However, a student moving from a special education to a regular education placement could be placed under a 504 plan.

Articulation: A coordinated and non-duplicated sequence of courses and associated credits that can be earned at both the secondary educational level and also at the post-secondary educational level. May include the opportunity for secondary students to participate in dual or concurrent enrollment programs or other ways to acquire postsecondary credits.

Articulation Agreements: Agreements established between secondary and postsecondary institutions of learning as a method for facilitating the transition of students from secondary programs into postsecondary options.

Career Technical Education (CTE): Organized educational activities that offer a sequence of courses that provide academic and technical training necessary for developing technical skill proficiency, earning a credential, certificate or degree. CTE emphasizes competency based applied learning.

Career Technical Student Organizations (CTSO): Career Technical Student Organizations are clubs sponsored by CTE programs. These student organizations offer structured opportunities for students to develop and demonstrate skills learned in the CTE program area.

Disability: A disability is a physical and/or mental impairment that includes the categories of autism, deaf-blindness, developmental delay, emotional disturbance, hearing impairment, mental retardation, multiple disabilities, orthopedic impairments, other health impairments, specific learning disabilities, speech and language impairments, traumatic brain injury, and visual impairments.

Students with Disabilities: Students with disabilities are persons (ages 3-21) who have been identified as having a disability and need special education because of that disability.

Tech Prep: Established in 1990s after P.L. 105-332 Carl D. Perkins Vocational and Applied Technology Education Act of 1998 (Perkins II) was passed. Tech Prep was developed to address the needs of high school students between the 25th and 75th percentile. Over time Tech Prep expanded to include all students and emphasized linkages between programs and institutions.

Tech Prep Consortium: Organization at the local level that develops articulation agreements and coordinates linkages between programs and institutions at the secondary and postsecondary level.

Transition: Transition is the process of moving a student with a disability from the primary role of a student to the adult role of a citizen in the community.

II. REVIEW OF LITERATURE

The emphasis for educators today is on accountability and outcomes. Educators are being held accountable not only for what a student should be learning while in school, but also whether the graduating student is prepared for the transition to employment, training or postsecondary education. With such an emphasis being placed on preparing the student to transition into society, it is important to provide information regarding strategies that will facilitate this process.

There are many practices in education that are reputable and acknowledged as being effective in bringing about positive outcomes for students. Foremost is the practice of collaboration, a commitment to communicate and build alliances between school systems, local governments, career technical training programs at community colleges and representatives from industry. Since the decisions and choices that youth, teens, and young adults make early in life will impact their future job opportunities and the future of our society, it is imperative that they understand the opportunities available through career technical training. Fortunately, articulation and alignment of courses from the high school to career technical colleges and community colleges is already in place and should assist students achieve positive outcomes; however, these options are not fully utilized. Furthermore, low retention rates must be addressed in both secondary and post-secondary

programs. As a solution to these issues more hands-on industrial learning in classrooms is being provided, especially in the career technical education courses.

The effectiveness of this increased hands-on learning provided in CTE classes is limited due to the fact that students are often unaware of how these skills mastered in CTE classes will pertain to jobs in the industrial/manufacturing environment. Also, students are unaware of how articulation of these CTE courses will reduce duplication of learning at the post-secondary level. Students need to be aware of this opportunity and its impact on their future employment options. It is important to refocus the effort of stakeholders to communicate and encourage participation in programs currently in place that provide a smoother transition from secondary to post-secondary programs and into the workforce. This effort is essential to preparing youth for tomorrow's workforce and will be addressed in this paper.

This chapter contains a review of the literature relative to this topic and is divided into four major sections. The first section provides a historical perspective of the special education and vocational education laws that have evolved over time. These laws have an impact on current practices regarding services provided to students with disabilities. The second section discusses the postsecondary outcomes of students with disabilities and the research that has been collected to evaluate these outcomes. The third section highlights the career technical education program, focusing on its development through the years. This section emphasizes the role that career technical education can play in transition and its overall effect on students with disabilities. In the fourth section, the basic concept of articulation is provided with an explanation of the various models available. Accepted

definitions of articulation are explained and expanded. The fourth section also highlights accepted "best practices" that benefit and assist students' transition from secondary programs into employment or postsecondary training.

Legislation Related to Secondary Programming for Students with Disabilities

Special Education Laws

In 1975, P.L. 94-142, the Education for All Handicapped Children Act of 1975, established that free appropriate public education would be available to all individuals with disabilities age 3 to 21. Since that time reauthorizations have resulted in many changes that impact the delivery of special education services. The Education of the Handicapped Act Amendments of 1986 (EHA) stipulated discretionary programs be utilized to establish and provide services that would facilitate school-to-work transition. These programs would be provided through (1) research and demonstration projects, (2) parent training and information centers, and (3) early intervention and early childhood special education programs. Funding for demonstration projects and research was provided through EHA. These laws laid the foundation for free appropriate public education and transition programs to assist individuals with disabilities transition through life. In 1990, the Individuals with Disabilities Education Act of 1990 (P.L. 101-476) recognized the importance of transition. This act required that the Individual Education Plans (IEPs) for students with disabilities include a statement of needed transition services for students age 16 and older. This law included a coordination of activities

focused on an outcome-oriented process that would assist the student successfully transition to postsecondary environments.

With the more recent mandates specified in IDEA 97 (P. L. 105-17) an increased emphasis has been placed on student outcomes and transition into the adult world. Before IDEA 97, special education often focused on "school issues"; that is, special educators assisted students in learning what was expected of them in the academic arena. One of the primary purposes of IDEA 97 was to "… ensure that all children with disabilities have available to them a free appropriate public education (FAPE) that emphasizes special education and related services designed to meet their unique needs and prepare them for employment and independent living" (Sec. 300.1(a)). Requirements for transition planning (IDEA 97, Part B) included a statement of transition services identifying student needs beginning at age 14 under the applicable components of the student's Individual Education Plan (IEP). Transition planning included identifying the student's course of study, such as participation in advanced-placement courses or a vocational education program (Sec. 300.347 (b)(1)(i)). IDEA mandated that no later than age 16 a statement of interagency responsibilities or any needed linkages should be included in the IEP (Sec.300.347 (b)(2)). The definition of transition services changed with the reauthorization of IDEA in 2004. The term "transition services" was defined as a coordinated set of activities for a child with a disability that:

- is designed to be within a results-oriented process, that is focused on improving the academic and functional achievement of the child with a disability to facilitate the child's movement from school to post-school

activities, including postsecondary education; vocational education; integrated employment (including supported employment); continuing and adult education; adult services; independent living or community participation; and [602(34)(A)]

- is based on the individual child's needs, taking into account the child's strengths, preferences and interests. [602(34)(B)]

The reauthorization of IDEA in 2004 continued to emphasize the importance of transition goals by requiring that the Individual Education Plan contain the following information when the student turns 16; this was a change from the requirements of IDEA 97, Part B where transition services were provided at age 14:

- appropriate measurable postsecondary goals based upon age-appropriate transition assessments related to training, education, employment and independent living skills, where appropriate;
- transition services needed to assist the child in reaching those goals, including courses of study; and
- beginning not later than one year before the child reaches the age of majority under state law, a statement that the child has been informed of the child's rights under this title, if any, that will transfer to the child on reaching the age of majority under Section 615(m). [614(d)(1)(A)VIII] This element of the law was also included in IDEA 97.

Career and Technical Laws

Special Education laws are not the only laws to shape the education of students with disabilities. As early as the Smith-Hughes Act of 1917 (PL 64-347), the federal government mandated support for vocational education. The strong influence of the federal government helped determine the scope and direction of secondary, and, even to some extent, postsecondary vocational and technical training. The primary focus of the Smith-Hughes Act was economic, recognizing the need to prepare young people for jobs as a result of the industrial revolution. Vocational education implemented through the Smith-Hughes Act emphasized job-specific skills to the exclusion of the traditional academic curriculum and was reauthorized from the 1920s through the 1950s, during which time new vocational-specific areas were added. The act contained no specific provision for students with disabilities and there was no assurance that they would have access to the vocational education provided by this law.

In 1963 the Vocational Education Act (PL88-210) was passed. This act signified a major change in federal policy and direction for career and technical education. Originally there was an exclusive focus on job preparation; however, this bill began to address a much broader social component, providing job skills to all students including students with disabilities. The Carl D. Perkins Vocational Educational Act of 1984 (PL 98-524) recognized the economic demands for a trained workforce with marketable skills and the importance of making vocational programs accessible to all students including students with disabilities.

The most recent reauthorization of the 1984 Perkins legislation, The Carl D. Perkins Career and Technical Education Improvement Act of 2005 (PL 105-332) (Perkins III), has made a dramatic shift to address school reforms and federal mandates. Perkins III places the strongest emphasis on three core curriculum issues: (a) *integration* of academic and career and technical education; (b) *articulation* of secondary and postsecondary programs; and (c) *connections* between school and the world of work. This reauthorization addresses improving student performance and achievement. For the first time emphasis was placed on academics, as well as occupational skills (Rojewski, 2002).

Career and technical education programs in the United States exist because of the Perkins federal legislation (Rojewski, 2002). This act is the backbone of career and technical education. The goal of the Carl D. Perkins Career and Technical Education Improvement Act of 2005 (PL 105-332) is developing a highly skilled workforce needed to keep America competitive in the global economy in conjunction with other Federal education and training programs, including workforce investment programs. Providing lifelong learning opportunities for all students that will prepare them for the workforce of today and tomorrow is an essential element of the Perkins Act.

As in the past, Perkins III continues to address the needs of special populations by considering the extent to which Career and Technical Education (CTE) programs prepare students, including special populations, for subsequent employment in high skill, high wage, occupations, or participation in postsecondary education *[Section 114(c)(3)(B)(v)(III)]*. The law also mandated that special populations receive additional support from CTE programs to help the students meet the standards required for graduation from high

school. By developing or strengthening basic academic skills required for graduation the students are also developing skills beneficial for transition into postsecondary educational training or employment opportunities. The emphasis seen in the Carl Perkins Act is:

- how secondary level programs will prepare CTE students, including special populations, to graduate from high school with a diploma *[Section 122(c)(1)(D)]*
- how programs will prepare CTE students, including special populations, both academically and technically, for opportunities in postsecondary education or entry into high skill, high wage, or high demand occupations in emerging or established occupations, and how participating students will be made aware of such opportunities. *[Section 122(c)(1)(E)]*

Services provided through the Career and Technical Education classes will assist students in developing skills essential for transition into the work force. It is imperative that educators utilize resources wisely and maximize the collaboration between secondary CTE classes and postsecondary options. This collaboration is evidenced through articulation or "career pathway" which means a coordinated and non-duplicative sequence of courses (which may include work-based learning experiences) and associated credits that:

- Identifies both secondary and postsecondary education elements;
- Includes challenging academic and CTE content that adequately prepares students to pursue the postsecondary education element of the career pathway;

- May include the opportunity for secondary students to participate in dual or concurrent enrollment programs or other ways to acquire postsecondary credits;
- Culminates in technical skill proficiency, an industry-recognized credential, a certificate, a degree, or completion of a recognized apprenticeship program. *[Section 3(9)]*

Articulation connects educational experiences with applied learning. The Carl Perkins Act identifies articulation agreements between secondary and postsecondary institutions as a method for facilitating the transition of students from secondary programs into postsecondary options. These articulation agreements can be established with 2-year technical programs and postsecondary education programs. The establishment of articulation agreements between secondary and postsecondary vocational and technical education programs is designed to provide opportunities for students participating in CTE programs, such as Tech-Prep. This link between the secondary and postsecondary CTE programs may include the relevant elements of at least one career pathway, the development and support for articulation agreements between secondary and postsecondary institutions, or supporting Tech-Prep programs and consortia.

In addition to the emphasis of articulation to assist with the transition of all students, Carl Perkins also emphasizes the importance of providing support to vocational service organizations, especially with respect to the efforts of increasing the participation of students from special populations. Table A outlines key vocational education and

special education legislation that supports training opportunities and transition services for students with disabilities.

Table 1

Key Vocational Education and Special Education Legislation to Support Training Opportunities and Transition Services for Students with Disabilities

LEGISLATION	**SIGNIFICANCE**
Vocational Education Act of 1963 (PL 88-210)	Established vocational education opportunities for those with academic, socioeconomic, and other disabilities. Included 10% of funds for the development of experimental programs to better serve students with disabilities.
Vocational Education Amendments of 1968 (PL 90-576)	Re-emphasized the thrust of the 1963 Vocational Education Act and set aside 20% of funds for students with disadvantages and 10% of funds for students with disabilities.
Education of All Handicapped Children Act of 1975 (PL 94-142)	Established a national effort in providing free appropriate public education (FAPE) for all children with disabilities aged 3-21. Included an individualized educational program (IEP), least restrictive environment, and due process with procedural safeguards for all students with a disability.

(table continues)

Table 1 (continued)

LEGISLATION	SIGNIFICANCE
Education Handicapped Act Amendments of 1983 (PL 98-199)	Established section 602, "Secondary Education and Transitional Services for Handicapped Youth," which addressed transition from school to postsecondary education, employment, and adult living. Funds were made available for demonstration projects.
Carl D. Perkins Vocational Education Act of 1984 (PL 98-524)	Assured equal access to high-quality vocational programs to special population students, including those with disabilities; disadvantaged, nontraditional students; and adults needing training or retraining.
Carl D. Perkins Vocational and Applied Technology Education Act of 1990 (PL 101-392)	Eliminated special populations' set-aside funding and allowed more flexibility to state and local agencies to better serve special population students. Required LEAs to provide information to students prior to eighth-grade concerning career choices and opportunities via career counseling efforts.
Individuals with Disabilities Education Act of 1990 (PL 101-476)	Established mandated transitional services to include a coordinated set of activities with an outcome oriented process. All students age 16 years and older (aged 14 years where appropriate) to have a written transition plan (ITP) as a component of the IEP.

(table continues)

Table 1 (continued)

LEGISLATION	SIGNIFICANCE
IDEA Amendments of 1997 (PL 105-17)	Continued and expanded the transition mandates of IDEA 1990 to include ITPs with a focus on a child's course of study, starting at age 14, to be updated annually and, at age 16, to focus on statements of transitional services and specific outcomes. Age of majority declaration was included as part of the IEP process.
Carl D. Perkins Vocational Technology Education Act of 1998 (PL 105-332)	Established guidelines and increased statement of accountability to make certain equal access for special population students. Access was to include recruitment, enrollment, and placement activities. Expanded special population definition concerning single parents.

SOURCE: Sarkees-Wircenski, M., and Scott, J.L. (1995). Vocational special needs (2nd ed.). Homewood, IL: American Technical Publishers, Inc. Printed with permission from the authors.

Free appropriate public education, including training provided in CTE classes, is assured for all students under IDEA, NCLB, and Perkins III. These laws work together to shape the secondary and post-secondary programs essential for the preparation of youth with disabilities for transition into the world after high school. It is important that all students are cognizant of the opportunities provided through these laws and access available programs as they prepare to transition into the adult world.

Postsecondary Outcomes of Students with Disabilities

Student Outcomes, School to Where?

Beginning in the 1980s, Congress authorized money to collect outcome data on students with disabilities. This effort is known as the National Longitudinal Transition Study (NLTS-1). Data were collected on students who were enrolled in secondary schools between 1987 and 1993. The NLTS describes the experiences and outcomes of youth with disabilities nationally during secondary and early adulthood. The NLTS-1 included more than 8,000 youth with disabilities from 300 school districts across the nation (U.S. Department of Education). Telephone interviews, surveys, and analysis of school records were utilized to develop a comprehensive understanding of the many aspects of the lives of young people with disabilities. The following factors were identified as negative influences on students with disabilities: high absenteeism, failing grades, and not being enrolled in either college or postsecondary vocational programs after high school. Students with disabilities were less likely to find competitive jobs that paid equitable wages when compared to peers because of the negative influences identified by the NLTS-1.

Recently, Congress authorized money for a second national longitudinal study, NLTS-2. The purpose of this study is to document the experiences of students age 13 to 16 in 2000 as they moved from secondary school into adult roles. This project is in the initial phases of data collection. Other researchers have collected outcome data too. A select review of these studies and the NLTS-1 results is provided next.

Student outcomes. Wagner, Blackorby, Cameto, Hebbeler, and Newman (1993) examined a variety of outcomes, including postsecondary school enrollment, employment, and independent living one year after graduation. The majority of special education students participated in competitive employment at some point (56%) and approximately one-fourth enrolled in post-secondary education. The major findings from the study suggested that employment rates were higher among males, whites, and high school graduates. Transition experiences of students evaluated varied by impairment group. Wagner's study indicated that participation in vocational education improved student outcomes (Wagner et al., 1993).

Blackorby and Wagner (1996) examined a variety of outcomes and compared those outcomes to youth without disabilities. Using data from the National Longitudinal Survey of Youth and the NLTS-1, the research results indicated that white youth and those who aged-out of high school (non-graduates and non-drop outs) were less likely to live independently. In addition, general enrollment rates in post-secondary education were higher for youths without disabilities, 68% of youth without disabilities enrolled in post-secondary programs compared to 27% of youth with disabilities.

Benz, Yobanoff and Doren (1997) examined factors that influenced competitive employment. The results of their study suggested that females with disabilities were five times less likely to be competitively employed one year after graduation than other groups. Higher rates of competitive employment were associated with skills in (1) reading, (2) writing, (3) math, (4) social skills and (5) job search skills. Findings also

suggested that students who did not require additional or continuing vocational instruction one year out of high school were more likely to be employed.

Doren and Benz (1998) examined factors that influenced employment outcomes. The major findings of this study included the impact of work experience while in high school and self-esteem. Factors such as having two or more job experiences while in high school and networking to obtain employment were more significant predictors of employment upon graduation. Students who had two or more jobs while in high school were more likely to be employed upon graduation than those who did not. As well, low-self esteem at the time of high school graduation and low-household annual income were associated with lower rates of competitive employment for young women with disabilities, but not among young men with disabilities.

The New York State Education Department (1999) studied post school indicators by surveying their graduates. This study examined the experiences of former special education students, including the effects of special education program components, such as transition planning, on outcomes. The survey revealed that a majority of former special education students (62%) were working or attending post-secondary education. Former special education students were less likely to enter post-secondary education programs than students from the general population (27 % vs. 56%). This difference was true even when they received the same type of high school diploma. Former special education students who reported that planning for transition helped them showed better outcomes on four factors (1) completion of high school diplomas; (2) transition to post-secondary

education, employment or day program alternatives; (3) connection to adult services; and (4) preparedness for community living, working and post-secondary education.

Horn, Berktold, and Bobbitt (1999) analyzed the surveys collected from the National Education Longitudinal Study (NELS), National Postsecondary Student Aid Study (NPSAS), Beginning Postsecondary Longitudinal Study (BPS), and Baccalaureate and Beyond Longitudinal Study (BB), examining the post-secondary school choices and outcomes of students with and without disabilities. Using the National Educational Longitudinal Study, Horn, Berktold and Bobbitt (1999) found that of those who completed high school in 1994, 63% enrolled in some form of postsecondary education and 42% enrolled in four-year institutions. The type of disability influenced enrollment rates; those with orthopedic impairments showed the highest enrollment rate (74%), and the lowest enrollment rate was for students with learning disabilities (58%). Data from the National Postsecondary Student Aid Study suggested that students with disabilities were less likely to be enrolled in four year institutions, but more likely to be enrolled in two year colleges. Data from the Beginning Postsecondary Longitudinal Study revealed that a majority of students with disabilities were still enrolled in school earning a degree or vocational certificate (53%). Of these students, 16% earned a bachelor's degree, 6% earned an associate's degree, and 19% earned a vocational certificate. The data from the Baccalaureate and Beyond Longitudinal Study suggested that students with disabilities were more likely to be unemployed than those without disabilities.

These studies present a picture of a challenging future for individuals with disabilities. Underemployed, low self-esteem, less likely to live independently, and low

income rates were described as characteristics typical of students with disabilities who had graduated from high school. Although these students were in need of marketable skills and additional training, they were less likely to be enrolled in a post-secondary program. These factors are still impacting students with disabilities and need to be acknowledged as issues that must be addressed before positive change can be made in the current educational system. The first step toward change is the acknowledgement of a problem and clearly these studies indicate that skills sets are not taught to students that will allow them to move toward independence and participation in the mainstream of society.

Variables affecting outcomes. Using the NLTS-1 data, D'Amico (1984) studied the differences in competitive employment for students with disabilities by their participation in vocational education. The results of the study indicated that while vocational participation varied by impairment, there was a strong correlation between participation in vocational education and eventual employment. Students who were deaf or who had learning disabilities were most likely to participate in vocational education (69% and 53% respectively), while students with multiple impairments (26%) were least likely to participate. Results suggested that participation in vocational education during the last year of secondary school was associated with higher employment rates.

Although Halpern, Yobanoff, Doren and Benz (1995) did not look at participation in vocational classes, their study examined factors that influenced post-secondary education by examining special education students' last year of high school. The majority of the students in their study participated in some form of post-secondary education one-

year after graduation. Approximately 50% attended community college. High scores on functional achievement inventories, completing instruction in certain relevant areas, participation in transition planning, parent and student satisfaction with instruction received, and parent perception that the student no longer needed help in certain critical skill areas were significant predictors of postsecondary education participation. These factors outweighed the effect of demographic factors in predicting post-secondary education enrollment.

Many studies have documented high unemployment rate, economic instability, and low levels of participating in post-secondary education programs for students with disabilities (Wagner & Blackorby, 1996). With the movement toward inclusion educators hoped to see an improvement in student performance and outcomes. Hall (2002) analyzed the outcomes of 89 students with learning disabilities that received instruction in an inclusive environment defined as any regular education class including CTE classes. The intent was to determine if students would have higher achievement scores after spending more time in an inclusive setting. Inclusion was a continuous variable reflecting actual hours spent in the general education classroom and ranged from mainstreaming and collaborative consultation to team teaching.

The researcher used a multiple regression analyses to test the hypothesis that hours in general education (e.g., academic core classes and CTE classes) would predict student outcomes, above and beyond the prediction provided by other independent variables known to be related to academic outcomes. Academic outcomes were measured using total scores in the mathematics and reading domains from the Woodcock-Johnson

Tests of Achievement-Revised (WJ-R) and the Kaufman Test of Educational Achievement (KTEA). Independent variables included: (a) full scale IQ, (b) SES, (c) grade, (d) attendance (days absent), and (e) average number of hours per week in general education classes. Inclusive environments, where students participated in regular academic classes and CTE classes, were shown to be effective in predicting student achievement (Hall, 2002). Differences among students with learning disabilities (LD) suggested future studies should examine service delivery model, classroom instruction and emphasis on transitioning to postsecondary training opportunities.

Plank (2001) researched whether a significant relationship existed between the CTE/academic ratio and an individual's persistence rate or likelihood of dropping out? Plank tested to see whether there was a linear relationship, either positive or negative, between the CTE/academic ratio and the odds of dropping out. Results indicated a negative significant relationship between these two variables of -2.06. By constraining the relationship between CTE/academic courses and dropping out as a linear relationship, Plank observed that when an individual took more CTE courses while in high school the likelihood of dropping out was reduced. Study results suggested that a student's probability of dropping out appears to be lowest when approximately three Carnegie units of CTE are completed for every four Carnegie units of academic subjects. It appears that a high school experience that tips too far toward career and technical education, excluding a strong academic foundation, impacts achievement negatively and increases the risk of the student dropping out.

Dunn, Chambers, and Rabren (2004) considered the variables affecting students' decisions to drop out of school. Between 1996 and 2001 a total of 1,654 students with MR (n = 708) or LD (n = 946) graduated from school systems that participated in the Alabama Transition Initiative (ATI). Of these students, 228 (14%) had dropped out of school. A control group was randomly selected from the remaining students; these students had graduated with a high school diploma or certificate but had not dropped out. Post-school interviews were conducted. Two sets of predictor variables (demographics and interview response) were analyzed in terms of their relationship to the outcome variable of dropping out of high school (Dunn, Chambers, & Rabren, 2004). Using logistical regression three models were used to predict the probability of dropping out of school. The third model was the best predictor. This model predicted the dropout status of 70.9% of the sample and significantly improved the null model, $\chi^2(4, N = 261) = 46.01$, $p < .001$. Additional information from the interview (i.e., helpful person, helpful class, general preparation) significantly improved the predictive ability for LD, χ^2 $(3, N = 261) = 31.23$, $p < .01$. The probability of dropping out for a student with LD who did not feel he or she was being prepared for life after high school and did not find any particular class and person helpful was .86. If students perceive their high school experiences as meaningful to their future goals, they are more likely to remain in school. Dunn, Chambers and Rabren recommended that teachers assist students in seeing the connections between curricula taught in high school and their future goals and that schools provide secondary programs that will encourage students to stay in school.

A review of the literature from follow-up studies regarding post-school outcomes, subsequent postsecondary education and employment provides insight into areas of need. Post school outcomes for students with disabilities have not been positive. Outcome studies provide useful information and document that students with disabilities are influenced by many factors outside of special education. Career technology education is a powerful strategy that has a positive impact on student outcomes and is available to all students. CTE will assist in the development of transferable skills necessary for entrance into the primary labor market (D'Amico, 1984; Plank, 2001; Wagner, Blackorby, Cameto, Hebbeler, & Newman, 1993).

Recent policy changes have been designed to streamline educational services in the hopes of improving student outcomes. To assist in the transition from secondary education to postsecondary education articulation agreements were developed. It was hoped that this strategy would increase positive outcomes of students and provide the bridge from school to work. In an effort to reinforce and improve students' basic educational skills CTE classes have focused on academic mastery of basic skills in conjunction with the hands-on applications learned in the CTE labs. The intent of this policy change was to increase the opportunities for people with disabilities to participate in mainstream society, especially employment, and increase their economic independence. However, despite these latest educational changes recent studies have documented low participation in postsecondary education programs for individuals with disabilities and high levels of unemployment, and economic instability (Meisel, Henderson, Cohen, & Leone, 1998; Schmidt-Davis, Hayward, & Kay, 1999; Stodden,

Conway & Chang, 2003). The question is what can educators do to improve student performance and outcomes so that students from special need populations enter the primary labor market? Unfortunately, there is a lack of data examining the effects of strategies currently in place, such as articulation, and its impact on transitioning students from secondary to postsecondary education and future employment options. Without such data it is impossible to determine whether recent policy changes will actually have a positive impact on the outcomes of students with disabilities.

Career and Technical Education

Roe (2001) called the gold-collar worker "a highly skilled multidisciplinarian who combines the mind of the white-collar worker with the hands of the blue-collar employee" (p. 32); this is the Career Technical graduate today. A national assessment of career technical education revealed that 96% of secondary students take at least one CTE course, 25% of students take at least three credits of CTE in one area or concentration, and 44% of students take at least three credits of CTE, but not all in one area. In 1992 and 1998, students on average took four CTE credits during their high school years (Stone, 2002).

Description of Career Technical Education Programs

"Career and technical education" or CTE means organized educational activities that offer a sequence of courses (which may include work-based learning experiences) that provides individuals with the challenging academic and technical knowledge and skills the individuals need to prepare for further education and for careers in emerging

and established professions and may lead to technical skill proficiency, a credential, a certificate, or a degree. CTE includes competency-based applied learning that contributes to academic knowledge, higher-order reasoning and problem-solving skills. Work attitudes and general employability skills are also taught. Current employment requires a high level of technical skills, occupation-specific skills, and knowledge of all aspects of an industry which can be attained through the CTE programs. These skills along with entrepreneurship are taught to individuals in the CTE classrooms.

As early as the 1970s the premise of career education was that schools should "use the entire educational experience to better prepare youth for career success in the full range of occupations while using the potential relevance of academic learning as a motivator for educational success" (Mangum,1992, p. 31-32). Career education is intended to prepare students with career guidance and focus so that with transition from school to work they are prepared to engage in productive, satisfying work throughout life. The goal of career education is to provide the student with the knowledge and skills to answer some of life's questions. "What do I want to do with my life?" "What skills can I develop?" "How much money do I hope to make?" or "How much education do I need?" CTE helps students answer these questions by connecting basic skills with an understanding of their relevance in the work place. Educators in CTE programs teach basic academic skills in the context of "learning to do" rather than "learning to know" (Wonacott, 1992). This is important because it shows direct application of the academics that students are mastering.

Before an evaluation of any program can occur there must be a clear understanding of the components of the program. The major components of career and technical education are represented by five categories: curriculum, instruction and delivery options, student assessment, clientele, and program evaluations or accountability (Rojewski, 2002). Philosophy provides the foundation for practice implementation and affects all areas. The influence of internal and external forces such as economic change, educational reforms, student learning, and society's expectations for career and technical education, must be considered when viewing the interaction of the five categories.

Figure 1

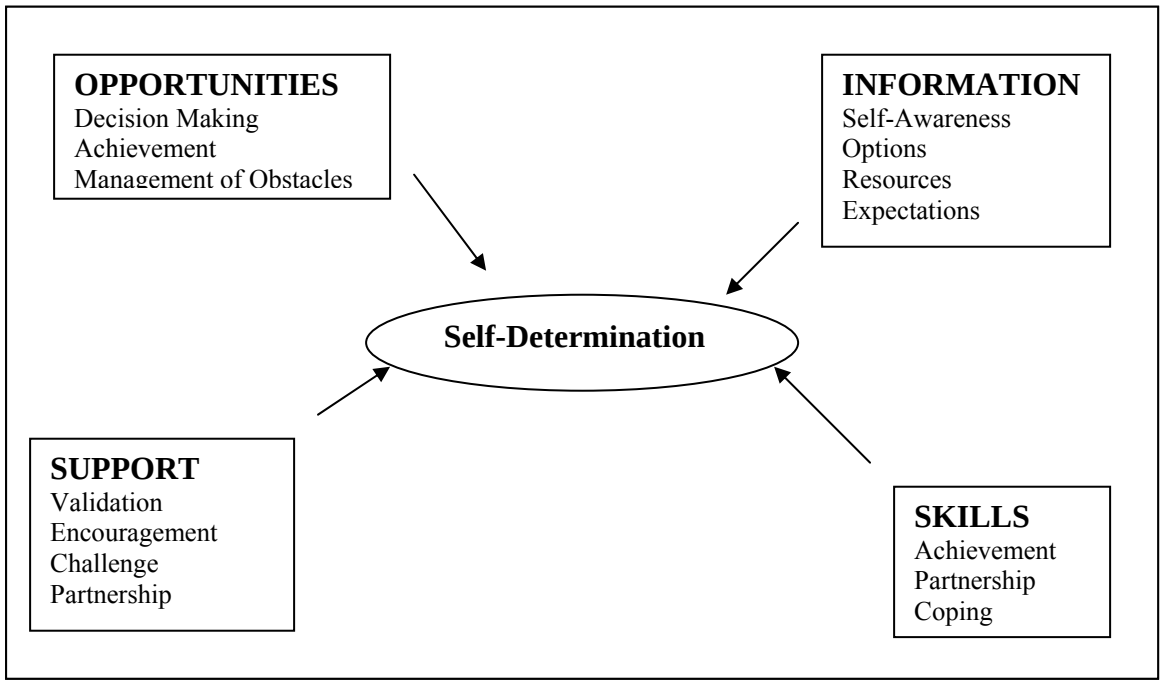

Figure 1: Facilitative conditions for promoting the self-determination of adolescents.

SOURCE: Sands, D. J., & Wehmeyer, M. L. (Eds) (1996). Self-determination across the life span: Independence and choice for people with disabilities (p. 263). Baltimore: Paul H. Brookes Publishing Co. Printed by permission of the author.

Over the years, consistent themes have emerged that must be incorporated in the conceptual framework that reflects the current practices of career and technical education. The prominent themes identified by Hartley and his colleagues in 1996 include basic skills deemed necessary for success in the workplace and include: (a) learning to learn; (b) reading, writing, and mathematics; (c) communication; (d) problem solving; (e) personal/career development; (f) interpersonal skills; (g) organizational effectiveness; (h) technology; (i) science; and (j) family. The focus of CTE programs is to continue the integration of academic and vocational education and emphasize the development of general transferable work skills rather than narrowly focusing on job-specific skills. To accommodate the needs of a changing workforce CTE programs have incorporated new skills into the curriculum; familiarity and use of high technology, higher order thinking skills including decision-making and problem-solving, and interpersonal skills that facilitate working in teams (Rojewski, 2002). To connect and reinforce the skills being taught by career and technical programs at both the secondary and post-secondary levels, articulation agreements have been implemented that strengthen the career pathway for students acquiring training in this area of education.

Curriculum reflects the state of the educational field; what is considered important, what is being taught (content or conceptual structure), and how it is taught (Rojewski, 2002). Today's CTE programs must be based on the need for students to demonstrate mastery of rigorous industry standards, high academic standards, technology, and general employment competencies.

Instructional/delivery options have changed over time to support and build a quality work-preparation system required by today's workforce. New methods and materials must accompany teachers' increased roles as collaborators and facilitators as they guide students in becoming lifelong learners to meet the challenges found in the workplace environment.

Student assessment, the third component of the CTE program, has moved from the traditional approach of testing to authentic or performance based assessment. Authentic assessment requires students to demonstrate their understanding or skill by responding to questions or creating a product that demonstrates understanding (Wiggins, 1990). Authentic assessment can be portfolios, exhibitions, checklists, simulations, essays, demonstrations or performances, interviews, oral presentations, observations, or self-assessment. Rubrics or scoring devices are used to document progress and provide a framework for consistency among grading. This assessment may be used to document student mastery required for articulation from secondary to post-secondary programs.

Historically vocational education was created to provide job-specific training to working class or non-college bound youth. However, today's workforce requires higher order cognitive skills with some postsecondary education for entry level positions and this requires a shift in clientele. This change in clientele creates a diverse student base but it may cause the silent majority to be overlooked. It is important to not overlook the student that probably benefits from career and technical education the most, the student that is struggling academically but benefits from the applied hands-on approach taught in the CTE programs. Lynch (2000) suggested from his research that upwards of one-third

of all secondary students enrolled in career and technical education programs are not college-bound. Another 8–12% of students in CTE programs are identified as being educationally disadvantaged. Both of these groups require job-specific preparation to assist them in transitioning from school to adult life.

Accountability has become a central focus of modern education. Perkins III legislation required that states develop evaluation systems to assess four core indicators of student performance. The areas to be evaluated are: (1) academic and vocational achievement, (2) program completion, (3) successful transition from school to postsecondary education and/or employment, and (4) accessibility and equity. One challenge to CTE programs is providing CTE teachers with the knowledge required to develop, implement, and maintain appropriate accountability systems (Rojewski, 2002).

When evaluating CTE programs it is important to broaden the concept of vocational education, integrating the curriculum with rigorous academics, improving articulation agreements with postsecondary education (two-year and four-year institutions), and stressing long-term preparation for productive careers that will be subject to increasing technological change and economic reorganization (Rojewski, 2002). CTE programs at the secondary level will continue to focus on less specific training for immediate entry-level employment upon graduation. Focusing on general knowledge of the workforce, career awareness, exploration, and guidance of career clusters, and developing higher-order thinking skills should be the goals of the CTE programs at the secondary level. The CTE programs at the postsecondary level should prepare students for specific jobs. To bridge the gap between these two programs, strong

articulation agreements must be in place and student attitudes must be considered regarding the use of articulation.

Best practices. Career Technology programs focus on the integration of academic knowledge with practical hands-on skills and knowledge. These programs are designed to help young adults find direction, purpose, and abilities in their lives by connecting the educational environment with the world of work. In a CTE classroom students have the opportunity to interact with their environment through hands-on activities in an educational site or lab. They don't just study how a car engine works; they apply their knowledge in the lab environment by identifying a problem and repairing an engine. Lab experiences allow students to explore their abilities, expand their skills and experience challenges. Working under the supervision of skilled master craftsmen they are provided direction, guidance, and applied instruction. Learning and work are merged within the framework of the CTE classrooms. The traditional concepts of learning, education, training, and performance are blurred as CTE students develop skills and abilities in their performance-based learning environments (Hawkins, 2002). The goal of CTE programs is to train young people for their adult roles as members of the work force.

In addition to the contextual presentation of information, CTE programs utilize the following two accepted "best practices" when providing instruction in the classroom. These best practices are represented by the following two tenets of career education: the infusion of academic instruction and the focus on skill development for future career options.

Infusion of instruction involves teaching prerequisite knowledge and skills that would be needed upon graduation throughout the program, rather than in isolation. The knowledge and skills required in the world-of-work are infused or taught throughout the curriculum. This means that instruction for (a) career information, (b) career decision-making skills, (c) academic basic skills, (d) technological skills, (e) information skills and (f) interpersonal skills are taught in a career context that makes the overall curriculum more relevant to students and can increase student motivation and learning.

Classroom instruction focusing on skill development that is required by a career cluster allows students to see the direct relationship between what they are learning and their own future. This approach allows students to see the direct relevance of their classroom instruction. Being able to visualize and understand the importance of what is being taught helps increase both motivation and learning (Wonacott, 1992). Career information and guidance provided through the CTE programs and other support personnel such as counselors, special education teachers, or vocational rehabilitation counselors assist students in making a suitable career choice as they prepare to transition from education to employment. In the applied learning environment of the CTE classroom students are allowed to explore and evaluate their abilities and interest which assist them in the appropriate selection of a career path. Articulation reinforces the concept of career emphasis as it develops strong partnerships between programs at the secondary and postsecondary education level with local industry. Local employers are encouraged to become involved since the goal of the educational programs at both secondary and postsecondary levels is to provide skilled workers for future employment.

CTE student organizations. Career and Technical Student Organizations (CTSOs) offer many structured opportunities to students in career and technical programs. The aim of these organizations is to develop the most critical skills necessary for success and transition to adult life, the skill of self-determination (McNally & Harvey, 2001). Self-determination refers to the extent to which a person assumes responsibility for his or her own goals, setbacks, and accomplishments. Self-determination has become a critical element of transition from school to adult life and is a key component of secondary special education.

CTSOs provide a unique program of career and leadership development, motivation, and recognition for students enrolled in career and technical education classes. Elements include (a) development of leadership skills, (b) encouragement of personal and social growth, (c) exploration of career opportunities, (d) participation in community betterment, (e) development of respect for work and life-long learning, (f) nurturance of team skills, and (g) development of citizenship. The focus on total student growth complements the development of student self-determination. Participating with CTSOs students in special education have the opportunity to belong to a group and experience opportunities to nurture self-esteem and leadership skills.

Malian and Love (1998) conducted research that evaluated students, parents, and teachers perceptions in several areas of typical high school activities. Research indicated an increase in quality of life resulted from participating in clubs, interest groups, and after-school activities such as those offered by CTSOs.

Activities and programs in the CTSOs offer a wide range of options for participants with various skills. Students foster positive self-attributions of personal capabilities through mastery of experiences, access to information and skill development, and support from others throughout these organizations (McNally & Harvey, 2001).

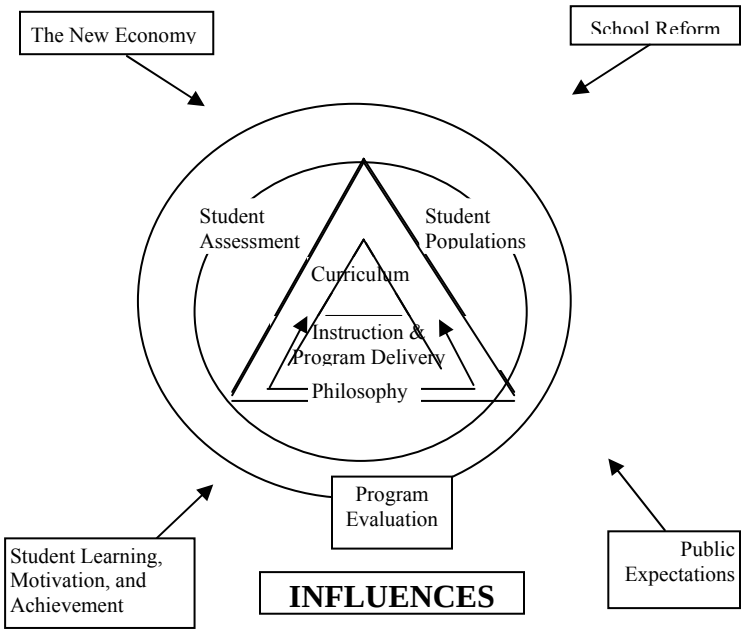

Figure 2: Conceptual framework for career and technical education.

SOURCE: Rojewski, Jay W. (2002). Preparing the workforce of tomorrow: A conceptual framework for career and technical programs. *Journal of Vocational Education Research, 27*(1), 7-35. Printed with permission of the author.

The benefits of belonging to CTSOs apply to all students, but are especially beneficial to students in special education. CTSO involvement promotes skills sets such as self-confidence, decision making, interacting and problem solving with others, and employment skills needed for independent living. The direct result of these skill-sets is

that the student develops a competitive advantage in the labor market and in the workforce.

CTE Program Reforms

Federal school reform legislation introduced significant changes to vocational policies and systems in the 1980s and 1990s. Many changes were introduced in CTE, including curriculum integration, career pathways, secondary-postsecondary articulation, dual enrollment, career academics, tech prep, and a greater emphasis on work-based learning activities (Stone, Kowske, & Alfeld, 2004). The changes brought about by reform legislation consisted of two components, an introduction of program changes and system changes to strengthen the link between school and work.

Tech Prep, one of the elements introduced in CTE, was established in the 1990s after the Carl D. Perkins Vocational and Applied Technology Act Amendments (Perkins II) was passed. This act contained Title III, the Tech Prep Education Act. Tech Prep was developed to address the needs of high school students between the 25th and 75th percentile who were largely ignored by other educational reform agendas (Bragg, 2000). Over time Tech Prep has expanded to include all students, emphasizing linkages between programs and institutions. The goal of this initiative was to facilitate experiential learning and career planning for all students, not just the middle 50%. By 1995, Tech Prep had become a part of almost 70% of all U.S. school districts, serving 88% of all American high school students (Bragg, 2000). These schools offered at least one CTE program for students. The most frequently offered program was business education. Table 2 outlines the types and availability of vocational programs in the year 2000.

Table 2

Types and Availability of Vocational Programs in 2000

Percentage of U.S. High Schools Offerings of Specific CTE Programs, 2000	
CTE Program Areas	Percentage of High Schools
Business	57.51
Technology and communications	43.03
Child care and education	33.18
Trade and industry	31.96
Agriculture and renewable resources	29.54
Health care	27.78
Marketing and distribution	27.54
Food service and hospitality	27.00
Personal and other services	12.24
Public and protective services	7.49

From Stone III, J. R., Kowske, B. J, & Alfeld, C. (2004). Career and Technical Education in the Late 1990s: A Descriptive Study. *Journal of Vocational Education Research, 29*(3), 206. Printed with permission from the authors.

More than 70% of all schools offered three or more programs for students to choose from. Table 3 identifies percentage of U.S. schools offerings of CTE programs by number of programs in the year 2000.

Table 3

Percentage of U.S. School Offerings of CTE Programs by Number of Programs 2000

Number of CTE Programs Offered	Percentage of High Schools
2 or fewer programs	28.56
3 to 5 programs	41.74
6 to 8 programs	25.20
8 to 10 programs	4.50
TOTAL	100.00

From Stone III, J. R., Kowske, B. J, & Alfeld, C. (2004). Career and Technical Education in the Late 1990s: A Descriptive Study. *Journal of Vocational Education Research, 29*(3), 206. Printed with permission from the authors.

In the late 1980s and early 1990s Tech Prep was still in its formative years. The American Technical Education Association (ATEA) established a set of minimum standards for tech prep programs (Stone et al., 2004). Using this guide Stern, Raby and Dayton in 1992 found that only 7% of schools actually offered tech prep programs that

met the standards specified by the ATEA. However, 41% of the reporting districts stated that they had a tech prep initiative in place. Stern, Raby and Dayton also noted a difference in implementation of the program depending on the location of the school district and CTE focus. Suburban districts reported higher implementation than urban districts (Stone et al., 2004). The focus of CTE classes in both districts was centered on business, trade and industry programs rather than agriculture, marketing, health or occupational home economics. By 1999 career technical education was available in most of America's 11,000 comprehensive high schools, 1,000 vocational high schools, and 800 area or regional vocational schools (Silverberg, Warner, Fong, & Goodwin, 2004). By the late 1990s 47.1% of public schools offered tech prep programs, and 80% offered articulated or dual college credit programs (Silverberg et al., 2004).

Education Reforms

With the federally mandated focus on academic standards brought about by the No Child Left Behind Act of 2001 (NCLB) many schools are emphasizing academic success over developing skills for postsecondary employment options. Academic success of students is evaluated through the use of standardized benchmarks and state graduation tests. There is concern that annual yearly progress (AYP) has driven many schools to increase the requirement of core academic classes needed for graduation, in the hopes of improving and increasing overall student academic performance. The increase in the requirements of core classes has caused a decrease in overall career and technical enrollment. Research has supported that the emphasis on academic subjects and the rise in total credit requirements for high school graduation have caused a decline in CTE

enrollment (Stone et al., 2004). However, many students are not "academic-track" material and do not benefit from academic-track coursework. There is a need for these students to experience success in a different educational environment such as the applied learning and hands-on experiences offered in the CTE classes.

Some studies have indicated that the number of CTE concentrators or students who focus on one vocational specialty by taking multiple classes in a specific vocational area has decreased but that the overall CTE course-taking has remained the same (Stone, et al., 2004). This may be due to students taking a collection of CTE classes rather than focusing on a structured program, resulting in enrollment in non-occupationally specific CTE classes. The unfocused approach to taking CTE classes is a result of poor guidance and transition planning rather than the result of new academic requirements. However, there is a substantial body of evidence that shows significant, positive economic benefits resulting from pursuing a CTE concentration in high school (Stone et al., 2004). So career guidance at the high school level and transition emphasis should consider this when scheduling and assisting students in the selection of their courses for graduation requirements.

It has also been shown that schools that have increased graduation requirements by three or more credits are twice as likely to see an increase in the enrollment of students with disabilities in the CTE programs (Stone et al., 2004). Table 4 reflects the percentage of U.S. High Schools reporting of CTE enrollment change between the 1995-1996 and the 1999-2000 school years by school type.

Table 4

Percentage of U.S. High Schools Reporting CTE Enrollment Change Between the 1995-1996 and the 1999-2000 Schools Years by School Type

Type of Enrollments and Type of School	Schools Reporting CTE Enrollment Change			
	Increase	Decrease	No Significant Change	Not Applicable
Total student enrollment (total)	58.22	20.34	21.16	0.28
Comprehensive High School	58.42	19.53	21.92	0.13
Technical or Vocational	67.95	13.62	16.55	1.88
Special Ed or Alternative	68.21	16.27	14.76	0.77
Total CTE enrollment (total)	34.14	23.34	14.60	27.92
Comprehensive High School	36.40	25.29	15.05	23.26
Technical or Vocational	59.65	22.36	16.24	1.76
Special Ed or Alternative	33.67	17.70	7.50	41.13
CTE enrollment among educationally or economically disadvantaged students (total)	27.55	35.67	5.08	31.70
Comprehensive High School	28.93	38.06	5.68	27.33
Technical or Vocational	29.48	39.87	9.26	21.39
Special Ed or Alternative	20.66	19.94	4.38	55.03

(table continues)

Table 4 (continued)

	Schools Reporting CTE Enrollment Change			
	Increase	Decrease	No Significant	Not

			Change	Applicable
CTE enrollment among disabled students (total)	23.02	35.17	3.57	38.24
Comprehensive High School	23.90	38.29	3.29	34.52
Technical or Vocational	26.73	44.95	2.60	25.72
Special Ed or Alternative	17.29	21.76	1.49	59.46

From Stone III, J. R., Kowske, B. J, & Alfeld, C. (2004). Career and technical education in the late 1990s: A descriptive study. *Journal of Vocational Education Research, 29*(3), 216. Printed with permission from the authors.

The increased enrollment of students with disabilities in CTE programs suggest that CTE programs may provide an opportunity for success for students with disabilities, success which can be elusive in the academic core classes. There is a vital need to connect students with disabilities and students that could be classified as the "forgotten half", as the W.T. Grant Foundation Commission on Work, Family, and Citizenship, in 1988 called the students who fell between the 25th percentile and the 75th percentile, to post-secondary options. As Rosenbaum stated in his book *Beyond College for All*, students who perform poorly in high school probably won't graduate from college, many won't even make it beyond remedial courses. Research indicates only 45 % to 49 % of students who enter college and earn more than 10 credits actually earn a bachelor's degree, many even fail to earn 10 credits (Adelman, 2004). For students with high school averages of C or lower, the chances that they will earn even one college credit are less than 50-50 (Rosenbaum, 2004). The prevalence of the non-academically focused students

is the driving force behind the CTE reforms and initiatives (Stone et al., 2004). The 1994 legislation encouraged schools to develop alternate programs that would serve these non-academically focused students, especially since this group of students do not show benefits from the traditional academic-track coursework.

Balancing Academics and CTE

There has been a shift in requirements for high school graduation and skills sets or training levels demanded by the labor market (National Center for Education Statistics, 2000). The goal to combine high-quality preparation in core academic areas with strong work skills and applications has become a trade mark of career technical programs. By doing so the high school graduate has several options available upon graduation: to articulate courses to the postsecondary level for continued education, to enter the work force, or to pursue education at the postsecondary level while working at the same time.

Impact on academic achievement. With the increased demands placed on high schools to promote students' proficiency in multiple core academic areas and prepare these students for postsecondary options that range from entry into a four year college to entry into the labor force there is a concern at the organizational level of the benefits of coupling CTE courses with core academic courses.

Plank (2001) observed the efforts to combine CTE and academic courses in typical high schools by studying students with dual CTE and academic concentrations. Plank hoped to determine if this combination of courses would contribute to a greater effort by the students resulting in better grades and higher levels of persistence rates. Comparing this dual concentration student to students who were only taking academic

courses and no classes in the CTE concentration areas, he hypothesized that a student's cognitive growth in the core academic subjects could be expected to be augmented when CTE and academic course-taking were featured jointly, as compared to when an academic concentration was featured alone (Plank, 2001). He suggested this was especially the case for low achieving students and predicted that a student's enthusiasm for high school would increase, decreasing the risk of dropping out of school whenever CTE and academic classes were combined. A proposed benefit of an integrated curriculum between CTE and academics was that the teachers in both areas would collaborate to assure that linkages between their subjects and career applications were present. Plank's study addressed a series of interrelated questions:

1. What balance was struck between CTE and academic course-taking?
2. Can we detect effects of the balance between CTE and academic course-taking on achievement growth, as measured by standardized test in the areas of mathematics, science, reading, and history?
3. Can we detect effects of the balance between CTE and academic course-taking on the likelihood of dropping out of high school (or, conversely, persisting in high school)? (Plank, 2001, p. 285)

Using data from the National Education Longitudinal Study of 1988 (NELS:88) that included transcript data collected after the 1991-92 school year, Plank limited his analysis to students who attended public high school and had remained in high school for four complete years. He examined the relationship between (a) the balance between CTE and academic courses taken during high school, and (b) academic achievement and

persistence in high school. Cross-tabulating academic concentration and CTE concentration for public high school students with four years of transcript data resulted in a sample size of n = 10,408. A small group (6.23% of the sample) fulfilled both the CTE and academic concentration required for the study. Just fewer than 19% of the original sample completed a CTE concentration but not an academic concentration and a larger group of 35.54% of the sample, completed an academic concentration but not a CTE concentration (Plank, 2001). Plank identified CTE concentration as having earned at least three credits in a single specific labor market preparation vocational area or concentration. He defined academic concentration as having fulfilled the requirements of earning four Carnegie units of English and three Carnegie units each of mathematics, science, and social studies. To evaluate cognitive achievement in the four subject areas Plank used multiple regression to compare the continuous dependent variables and controlled for confounding factors as he focused on the effects of CTE and academic course takings' influence on overall achievement. Using a nominal, dichotomous dependent variable and multiple independent variables he evaluated the models of dropping out with a logistic regression.

Analysis of the data revealed that the purely CTE concentrators had the lowest average test scores in each subject area based on mean 8th grade test scores of achievement. Using a multivariate model, the 1992 test performance in four core academic subject areas was examined. Controlling for gender, race/ ethnicity and socioeconomic status, Plank focused on the effects of CTE and academic course-taking. Over and above the background control measures, the course taking indicators had

significant associations with student achievement (Plank, 2001). Three dummy variables were used to indicate a student's balance of CTE and academic courses. The dummy variables improved the fit as measured by improvements in adjusted R^2 statistics. A modest effect size of 0.07 in the area of mathematics was observed between the academic concentrators and the dual concentrators. For the other subject areas the effect size was of a similar magnitude. Dual concentrators lagged behind the purely academic concentrators in achievement growth, but not by large margins. There was a small but statistically significant effect of choosing to pursue two concentrations in high school.

Plank concluded that the dual concentrators lagged behind the purely academic concentrators in achievement growth, but not by an especially large margin. The explanation of this observed difference may be the similar amount of total mathematics, science, English and social studies classes both groups completed during their high school years. In both groups the means are within 0.2 Carnegie units of each other. However, in higher mathematics and higher science, those classes that included geometry, Algebra 2 through pre-calculus and specialized courses in chemistry, physics, and biology, the academic concentrators distanced themselves from the dual concentrators slightly more. Plank theorized that the difference of just under a semester's worth of higher mathematics courses might explain the differential achievement effects he observed between the two groups. Another reason for the discrepancy in higher mathematics and higher science credits was that the dual concentrators were taking more CTE courses, on average 6.5 units of CTE credit, as compared to the academic concentrators, who completed only 2.4 units of CTE on average. There is only a finite

amount of time in a student's high school experience and the higher number of CTE courses among the dual concentrators would have cut into their options of other potential course offerings. Plank's findings also suggested that there is a small but statistically significant effect on academic achievement as a result of choosing to pursue two concentrations in high school.

Impact on student persistence. Plank (2001) observed that an increase in the CTE courses an individual took while in high school reduced the likelihood of dropping out. The results of his study suggested that a high school experience that tips too far toward career and technical education, excluding a strong academic foundation, impacts achievement negatively and increases the risk of the student dropping out.

Suggested findings. The results from Plank's (2001) research would indicate that a mix of CTE and academic courses could lower the risk of dropping out for some students. However this was only one study and additional studies to evaluate this dual relationship between CTE and academics are needed. Given the importance of a high school diploma in society today, even with the slight reductions seen in test scores it might be wise for educators and policy makers to encourage this dual relationship between CTE and academics in order to achieve higher graduation rates. CTE brings learning into focus for many students and articulation carries it a step further by connecting their education to the future.

Benefits of CTE

Participation in CTE benefits both society and the individual. There are positive economic benefits when students pursue a CTE concentration in high school (Stone et al.,

2004). Students who pursue CTE will build houses, fix cars and cut hair. Society cannot live without them. They become tax paying employees who comprise the heart of our economy and sustain our country.

Students benefit by participating in CTE. Today's jobs require strong high school level skills in computation, writing, and comprehension at the 9th grade level but not college level skills. Over 40% of high-school seniors lack ninth-grade math skills and 60% lack ninth-grade reading skills (Murnane & Levy, 1996). Solid skills developed in high school prepare students for entry-level positions and keep the door to promotions open (Rosenbaum, 2004). CTE offers a viable alternative for students not headed to college. Students do not need to go to college to obtain good jobs, but they do need to master high school level skills. CTE courses will assist students in the development of basic academic skills, specific employment skills and work ethics that are necessary for success in the competitive labor market. This will result in the multi-skilled, knowledge-based, gold-collar worker, who is able to use information to solve problems and create solutions. This is the worker who is highly valued and likely to become even more so in the future (Wonacott, 1992).

Maximum benefits are gained when students take three sequential courses in CTE, or specialize by taking four or more courses in a particular CTE field. These courses provide the skills necessary to transition into many jobs that require technical skills. Such jobs offer excellent benefits, good working conditions, and annual salaries that often exceed $45,000 or higher with overtime (Rosenbaum, 2004).

Wagner et al. (1993) found that regular and vocational education classes were associated with higher employment rates. Their study also suggested that the participation rate decreased with students whose disabilities were identified as severe, were economically disadvantaged, or were a parent. However, these students are the ones who need vocational skills the most to assist with successful entry into future employment opportunities. Without these vocational skills students from these populations will be forced to accept low-skill, low-wage jobs in the work force, and this will pose unique economic challenges concerning cost-of-living and benefits needed to be self supporting in today's society. In fact studies have indicated that there is a strong correlation between students with disabilities who participated in vocational education and eventual employment. D'Amico (1991) found that students with learning disabilities or who were deaf were more likely to participate in CTE programs, 69% and 55% respectively. Students with multiple disabilities (26%) were less likely to participate in these vocational programs. Results from this study suggested that participating in the CTE programs during the last year of the students' secondary program correlated with higher employment rates.

CTE classes also address other non-academic skills, such as, timeliness, diligence, and social competence, which are essential to success in the workforce. For many jobs in the labor market employers are looking for prospective employees who have solid work habits and strong basic skills, two things offered through CTE classes. Career technical classes provide skills and job placement assistance to students who participate in the program. Career technical teachers are able to provide employers with trusted

recommendations about students' social skills and work habits, even those from disadvantaged backgrounds or with disabilities. Approximately 9% of work-bound high school graduates get jobs after graduation through school-based job placement, with recommendations from career technical teachers (Rosenbaum, 2004). These students have 17% higher earnings by age 28 than students who find their own jobs after high school (Rosenbaum, 2004). School-based job placement through CTE programs helps more blacks and females than white males, thus it assists students who normally have the greatest difficulties in the labor market (Rosenbaum, 2004).

CTE has also been found to have a positive impact on students who are at risk of dropping out and impacts their future employment options. Dropping out of school severely limits future educational choices and employment opportunities. The Office of Special Education Programs has reported annual school-exiting data on special education students by disability category and age since 1984-1985 (Harvey, 2001). These data reveal that students with disabilities drop out of school at a rate of three times that of their peers. Dropping out has serious connotations for the individual and society. The Institute for Educational Leadership suggested that school dropouts cost the nation from 60 to 228 billion dollars each year in welfare, lost revenue, crime prevention, and unemployment expenditures (Hahn, Danzenberger, & Lefkowitz, 1987, as cited in Dunn, Chambers, & Rabren, 2004). High school dropouts earn $6,415 less per year than high school graduates (U.S. Bureau of the Census, 1994, as cited in Dunn, Chambers, & Rabren, 2004). Conversely, the importance of staying in school is underscored by the fact that students with disabilities who complete high school have higher levels of employment and

postsecondary education or training participation as well as higher wages once they are in the workforce (Harvey, 2001). Several researchers have noted the relationship between participation in CTE and dropping out. For example, Wagner (1991) found that students who took CTE courses had significantly lower absenteeism from school and a significantly lower probability of dropping out of school. Involvement in CTE programs can promote student completion of school (Wagner, 1991).

Inclusion of Students with Disabilities in CTE

Inclusion in the past has emphasized the mainstreaming of students in academic classes; however, with the focus on school-to-work and providing instruction in transitional skills, more students are included in vocational classes with the goal of obtaining functional occupational skills.

Instructors in career and technical education classes often struggle to educate a generation of students for which the overall academic standards have been below standard. The average "C" student in high school has one goal, to finish school and get a job that pays decently (Fornero, 1994). Career technical classes make sense because the skills learned provide a clear pathway to future jobs. Many students with disabilities have the same goals to finish school and get a job that pays decently. Skills learned in the CTE programs can assist students accomplish these goals. The Individual Education Planning committee should consider student interest, aptitudes, and abilities when assisting students with disabilities select the appropriate CTE program that will facilitate achieving their long term goals of independence and job security.

It is imperative that students with disabilities enter the CTE classroom environment with strong basic skills in reading and math, proper instructional support from the special education teachers, and appropriate career evaluations and guidance. It is essential to match the student with disabilities to the correct CTE training program, to do less than this is setting the student with disabilities up for failure. Special educators must remember their responsibility is not just to advocate for students, but also to guide students into the appropriate learning environment that will assist them in transitioning from the sheltered school environment to the competitive world of work.

The increased number of students receiving special education services served by vocational education and the demands of these students make it essential that vocational teachers be fully prepared to serve these groups effectively. The National Assessment of Vocational Education: Final Report to Congress (1994) found that individuals with disabilities and/or economic and academic disadvantages take more vocational education than other students (U.S. Department of Education, 1994 as cited in Kraska, 2002). Kraska (2002) examined the amount of knowledge that CTE instructors at the secondary and postsecondary level had regarding learners from special populations and the observed differences between the responses of secondary and postsecondary CTE teachers regarding special need learners. Participants for this study consisted of 55 secondary and 18 postsecondary teachers. The 73 teachers participated in certification courses during the spring and summer of 1995 and comprised a time-place sample of beginning CTE teachers in Alabama. A modified version of the Vocational Special Needs Inventory (VSNI) was administered. The VSNI is a 36-item inventory related to serving individuals

with disabilities. A reliability analysis, item sums, frequency distribution, mean scores, standard deviations, and MANOVA were calculated to investigate the research questions. The results indicated nearly 40% of the teachers had inadequate knowledge of learners from special populations. Responses of teachers on the VSNI indicated that additional preparation regarding special population learners is needed. The results suggested the need for teacher pre-service and in-service training programs to include content and experiences related to this special population.

CTE's impact on transition. The career focused curriculum seen in the CTE classes has been proposed as an effective strategy for making instruction relevant to students. The CTE classroom environment supports providing the opportunity for experiential and cooperative learning while learning hands-on skills in the lab environment. This lab setting also provides workplace socialization for students, the focus on pre-employment skills that are essential for future success in the labor market. Pre-employment skills include punctuality, completion of tasks, staying on task, working as a team member, problem solving, and other essential skills for the workplace. In addition, vocational educators can shift their programs from a subject to a career-focused curriculum by incorporating school-to-work activities; including job shadowing opportunities, apprenticeship opportunities, or on-the-job training opportunities upon graduation. Skills mastered in vocational classes are often the skills that will transfer to future jobs. Often the skills learned at this level are for entry level positions and are transferable to technical colleges where the student will obtain additional training at the post-secondary level. The training at the post-secondary level will result in the form of

competencies in specific trade areas resulting in the student reaching the level of journey person or master craftsmen. The skills learned at the post-secondary level result in higher level positions in the workforce that provide increased benefits: higher pay, job security, and benefits to the student.

The CTE instructors not only have experience in their trade area, but they are knowledgeable of the skills required by local employers. This familiarity with the standards of the local employers helps them match the skills required for their trade area with the entry level competence expected by an employer. This knowledge is beneficial to students with disabilities who are interested in entering the primary work force and will assist them in a successful transition to employment upon graduation from high school or post-secondary training programs at the career technical colleges.

Counselor's role. It is essential that students with disabilities receive career counseling and assistance in selecting the correct program of study that best matches their interests and abilities. School counselors are one among a number of professionals who assist in career counseling and transitioning from middle school to high school. The school counselor advises the student and their family and coordinates the selection of the individual student's program of study. The program of study determines the classes, including the CTE courses, the student will take while in high school. These classes begin the process of obtaining skills that will lead to employment in the future.

Understandably, the counselors' role in transition has been limited. Milson (2002) conducted a survey to assess school counselors' interaction with students with disabilities. Results from the survey indicated that 82.8% of the counselors provided

individual and/or group counseling to students with disabilities. However, only 40% of the counselors assisted students and their transition teams with transition planning during IEP meetings. The participants felt more prepared to provide counseling and less prepared to assist students with transition guidance or planning. Career counseling is an essential element to matching student interest and aptitudes with the correct CTE concentration and it is also one of the first steps provided to the student with disabilities that will assist successful transitioning in the future.

Special educators, CTE instructors, and counselors must collaborate in their efforts to assist students with disabilities connect their personal interest and abilities and the educational/CTE environment to the world of work. This collaboration can result in a seamless transition model that is beneficial to all students, not just students with disabilities. Assisting students to recognize the importance of courses that will articulate to the post-secondary technical college is an important element often overlooked in the focus of transitioning students from the high school level to life after high school.

What is Articulation?

The Carl D. Perkins Career and Technical Education Improvement Act of 2005 (PL 105-332), (Perkins III) identifies articulation agreements between secondary and postsecondary institutions as a method for facilitating the transition of students from secondary programs into postsecondary options. For the purposes of this paper articulation will be defined as the partnership or agreement between secondary career technical schools and postsecondary institutions. This agreement involves the

coordination of curricula across two or more institutions to ensure that graduates possess the prerequisite knowledge and skills required for employment in a chosen occupation (Lankard, 1991).

The U. S. Department of Education's (USDE) definition of articulation is a process that links a high school and college course in order to help students avoid experiencing a delay or duplication of learning. The eight major benefits of articulation identified by the USDE, are:

- students in courses connecting theory and application are able to grasp concepts more quickly and relate them to problems they will encounter in the workplace;
- students are taught the skills that employers want, increasing future employability;
- the sequence of courses allows the student to proceed from one educational level to the next without repeating coursework;
- articulation provides options to make high school and college more attractive and relevant to students; potentially improving attendance and lowering dropout rates;
- articulation encourages teachers to collaborate so that curriculum is reinforced;
- Tech Prep curriculum is designed with the input of business and industry to insure that students are being taught skills that employers want, resulting in students that are prepared for current workforce needs;

- Tech Prep builds student competence in mathematics, science, communications, and applied academics; supporting successful completion of high school standards required for graduation and future employment needs; and
- articulation leads to a certificate or an associate degree and may lead to further advanced education (U.S. Department of Education, 1994).

Articulation is the focus of Tech Prep which was developed as a nationwide career initiative that provided students with a planned program of study that incorporates academic and career-related courses articulated between secondary and postsecondary levels leading to careers upon graduation. Through the development of consortiums across the United States, support and alignment of programs between high school CTE programs and career technical colleges was initiated. Students receive college-level credit for courses taken in high school under the articulation guidelines. Students earning 85 or higher in selected courses have the opportunity to exempt matching courses at the technical college(s) that are working in conjunction with local high schools in an articulation agreement. Articulation allows high school students to progress through postsecondary training quicker, resulting in less duplication of skills mastered and economic savings for higher education. Tech prep can be described as "advanced skills" articulation because it enables students to save time through coordinated course work to acquire the more advanced occupational knowledge and skills required by changing technologies (Robertson-Smith, 1990).

Making the Case for Tech Prep and Articulation

Today's labor market has been labeled the "new economy" because of the proliferation of jobs at the sub-baccalaureate level (Carnevale, 2000). Because of the increase in employment requiring less than a baccalaureate degree, the community colleges will have the opportunity to become a key provider of education and training for future workforce needs. To facilitate a true continuum of services, vocational exploration needs to begin early at the secondary level or before, moving to a more occupationally specific education offered through the CTE programs that continues at the technical college. Focusing on creating seamless educational experiences will necessitate collaboration between the secondary and post-secondary levels of education. This increased collaboration will assure an integrated academic and vocational curriculum that will begin at the high school level and extend to the two year college.

Furthermore, an emphasis on career clusters or pathways that guide students from secondary to post-secondary training should become the focus for future employment options upon graduation. The U.S. Department of Education's Office of Vocational and Adult Education (OVAE) designed a new rubric consisting of sixteen career clusters in an effort to redefine CTE and focus on building linkages between CTE and a logical categorization of all jobs in the U.S. labor market. These career clusters emphasize career ladders rather than entrance into entry-level jobs. Participation in career ladders will encourage continued educational training for employees. This attention to life-long learning will be utilized to assure and sustain career opportunities and promotions in the workforce. A case in point would be health care. This career cluster offers a wide range

of positions within the field of health care. Entry level positions in health care can access the career ladder that will lead to increased salary and employment stability. A secondary student could take courses to prepare to become a certified nursing assistant (CNA). Through dual enrollment and/or articulation of courses to the technical college, additional training at the post-secondary level would provide the skills to become a licensed practical nurse (LPN). The continued training provided from the secondary to the postsecondary level of education allows participants to move up the career ladder in health care. Articulation agreements between technical colleges and four-year colleges provide the training necessary to become a licensed practical nurse (LPN). Figure 3 describes job characteristics and qualifications required of today's worker.

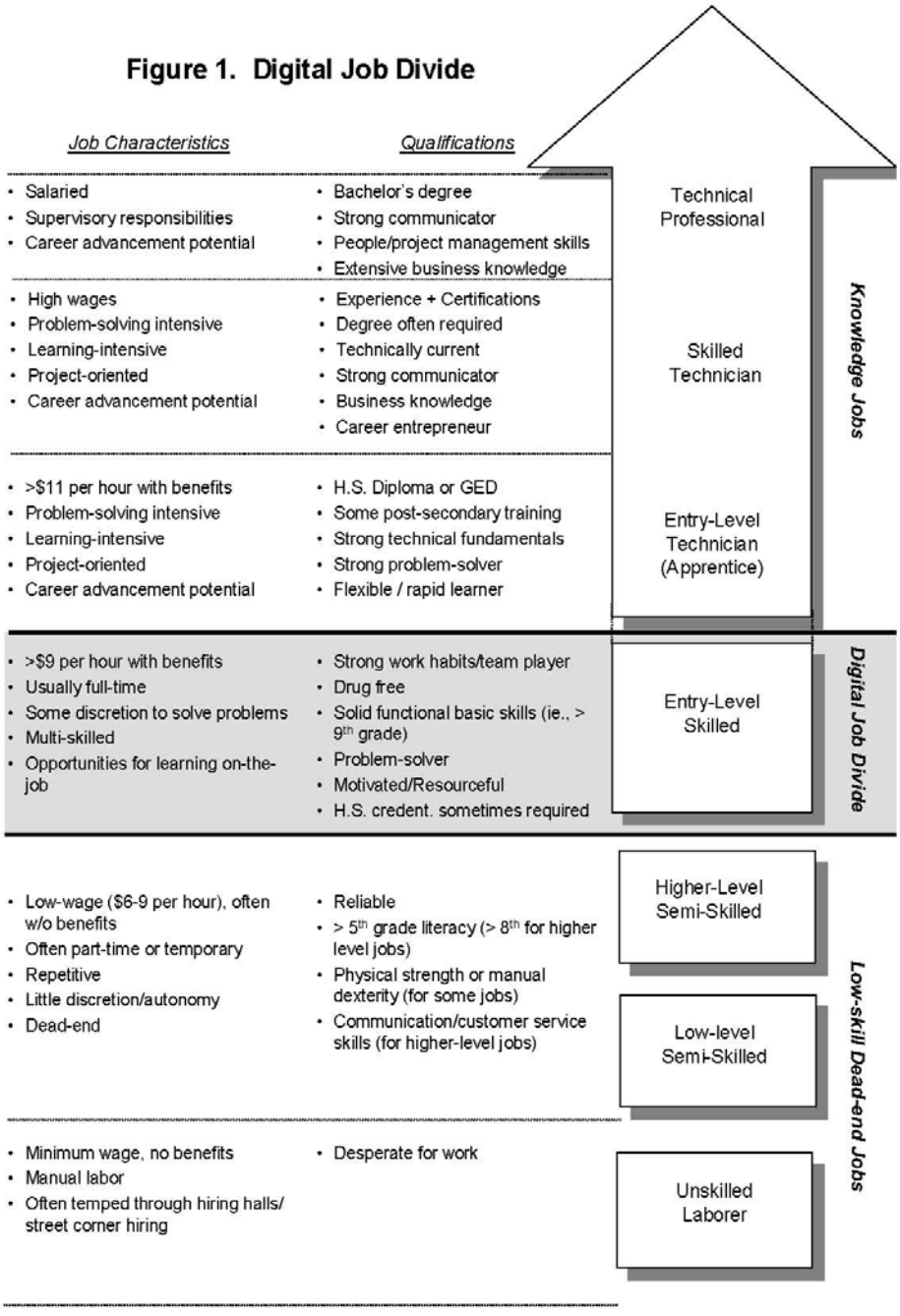

Figure 3. Impact of educational training on job opportunities.

Source: Illinois Department of Employment Security, Occupational Employment Statistics (OES), Chicago PMSA, July 2002.

Finally, as curriculum and instruction become more meaningful with applied academics, active teaching strategies, learner-centered instruction, and project-based assessment, students may be encouraged to continue their education rather than to drop out. The financial impact of education is well documented in research and can be correlated with earning potential (US Census Bureau). Figure 4 reflects average earnings of high school graduates by educational attainment.

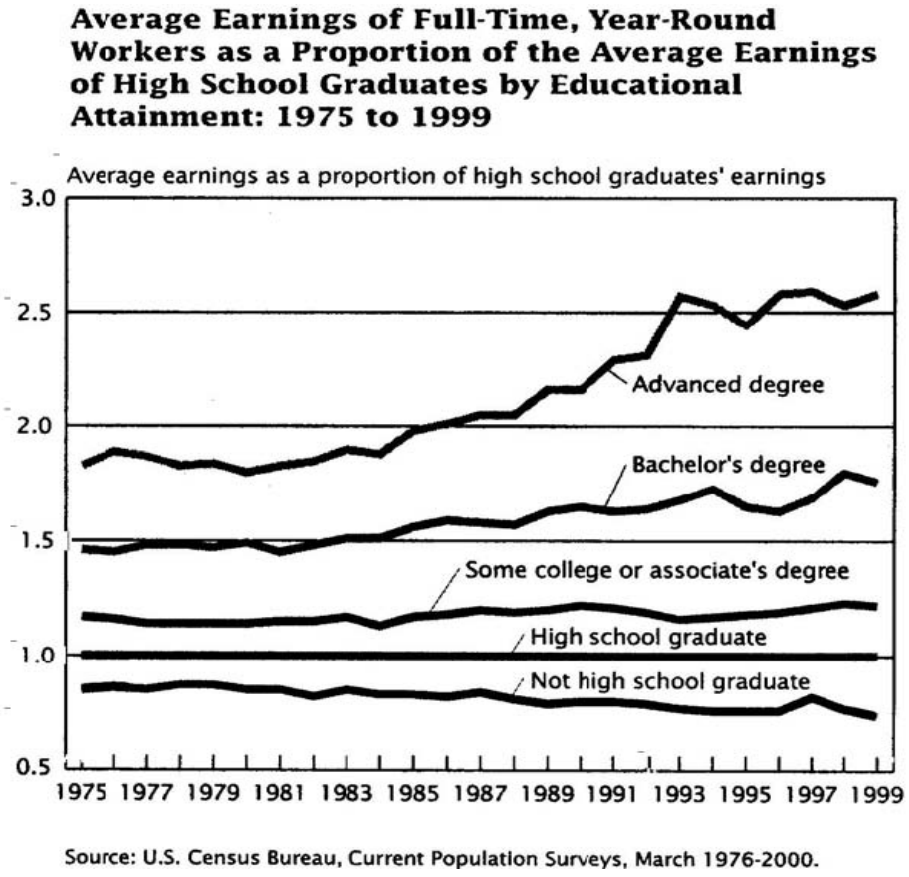

Figure 4. Educational degrees and the impact on earning potential.

Source: U.S. Census Bureau, Current Population Surveys, March 1976-2000.

Moreover, with the focus on strengthening basic skills through applied academics in the CTE labs, students will be encouraged to meet higher academic standards and this will benefit them in future employment opportunities. Students will gain from discovering the connection between the theories taught in the classroom and the work in which they experience in the labs. Understanding that what you learn in school will be applied in the community at a future job is a powerful educational tool. These meaningful linkages between academics and vocational education will assist the student in lifelong learning as they move into their future employment opportunities.

Types of Articulation Agreements

Initially articulation was simple. Students moved in a vertical progression from high school to technical college to the university. Parnell (1985) proposed that by linking secondary and postsecondary curricula, structure and direction could be added to educational programs that serve students in high school. Parnell's theory was that any student could receive the benefits of eliminating unnecessary duplication of program content and could be introduced to the technical knowledge and skills required by today's employer. Articulation or "continuity" of education can be provided in several types of articulation agreements (a) the 2 + 2, (b) the 4 + 2, or (c) dual enrollment.

The 2 + 2 agreement provides students with two years of high school training and two years of college training in an area of concentration. Students in this articulation agreement are trained at the high school level, usually at the eleventh and twelfth grade level, within a specific concentration so that they can transition into more advanced

training at the technical college level. Responsibilities for instruction are shared by both secondary and postsecondary programs. Core academic teachers and CTE instructors meet with faculty members from the postsecondary level to align the courses that will be articulated. This collaboration assures that the material taught in the courses at the high school will provide the foundation required at the postsecondary level and will reduce the duplication of instruction for the student.

The 4 + 2 agreement provides students with four years of high school training and two years of college training. The emphasis is on career exploration during the first two years of high school coupled with an emphasis on basic skills required to be successful in the advanced training at the postsecondary institution. Emphasis in the 4 + 2 plan is also placed on advanced communication, mathematical, scientific and technological knowledge and skill development coupled with appropriate hands-on experiences (Lankard, 1991). These skills address the current needs of employers, providing the bridge from the educational environment to the employment world.

Dual enrollment allows high school students to simultaneously attend high school and technical college. Credits earned may be applied at either institution. Some courses will be applicable to core academic areas, while others will be part of an articulation agreement that will allow for continued advanced training in a career technical concentration. This agreement between the high schools and the technical colleges allows for contracting to offer classes that the high school may not be able to provide due to limited expertise or equipment. It encourages combined enrollment, shared facilities, and

enrichment of programs. Dual enrollment can be a win-win situation for both institutions and students.

These articulation agreements are a result of needs generated by the changing economy, technology, and educational programs available in today's society and by the needs of the ever-changing work force. The overall goal of these types of agreements is to prepare the youth of today for the work of tomorrow and provide a career ladder approach to their progression through their educational experience.

Benefits of Articulation

Regardless of the type of articulation there are advantages for both students and schools. Students are encouraged to earn transferable credit while in high school and articulate this credit to the postsecondary programs; this promotes entry into the postsecondary institution. With the option to take courses taught by faculty from the postsecondary institution or by traveling to the technical college for instruction the student is acclimated to the postsecondary standards, expectations and college environment encouraging continued persistence.

Another advantage for the student is that postsecondary programs can be completed in less time by eliminating duplicated course content and by granting advanced placement to students moving into the postsecondary programs. This process promotes lifelong learning by providing students with a wide range of educational choices at the postsecondary level (Proctor & McElvey, 2001).

Articulation also allows families to maximize the monies set aside for tuition, since tuition and credit validation fees will be waived for articulated courses. This

financial factor allows maximization of the funds available and encourages students to continue their education beyond the secondary level to obtain the ultimate goal of marketable skills that will assist them in future career options.

The secondary level schools benefit by having students actively engaged in the learning process. The students are aware of the benefits that will be available to them and their future by articulating, thus encouraging them to continue training opportunities at the postsecondary level. This incentive may encourage students to stay in school rather than drop out before completion. The U.S. Department of Education concluded that participation in vocational education has value in that it prevents students with disabilities from dropping out of school (U.S. Department of Education, 1995, 1997). Research suggests that special education students who receive vocational training in high school are less likely to drop out and more likely to be employed competitively after high school (Harvey, 2001).

Both institutions benefit from articulation agreements in that there is a level of communication provided that would not exist otherwise. Faculty members from both the secondary and postsecondary level have the opportunity to meet and discuss needs, goals and objectives that will benefit the students they serve and their individual institutions. Through this dialog course objectives can be aligned and key concepts required for mastery can be agreed upon. Course competencies required to achieve an acceptable mastery standard can be identified and properly placed in the education continuum, which will maximize the learning opportunity for students.

A concern for funding, upkeep of facilities and provision of services is often an issue for many educational institutions. Articulation provides a possible solution to these concerns. Miller and Imel identified the benefits of credit articulation agreements between institutions (as cited by Naylor, 1987). These benefits included reducing duplication of learning, increasing the effectiveness and efficiency of learning, improving program content and standards, allowing for fuller use of existing program facilities and equipment, providing an attractive option for students and thereby supporting high school completion, and enabling postsecondary institutions to obtain larger enrollments and better prepared students (Naylor, 1987). Dual enrollment allows institutions to share faculty, facilities, and funding resources at both levels and provides a wider range of services to the students needing services.

Articulation for Students with Disabilities

Corthell and Van Boskirk (1984) viewed the vocational development of students with disabilities in terms of a "service-outcome continuum" through which students receive progressively less vocational support as they develop greater vocational independence (Naylor, 1985). This service-outcome continuum is still an appropriate description of the services provided through the CTE program and the articulation of classes to the postsecondary level. The primary providers during this transitional period would be special education, vocational education, and vocational rehabilitation.

Initially the special education instructor would coordinate the IEP and the ITP for the students, assisting them in identifying their specific career interest and goals. Working with the counselor at the high school level, the special education instructor

would help coordinate the courses that would fit the students' needs. As the students begin instruction in the CTE classroom, these special education instructors would provide the additional support needed by the students to allow success in the CTE program. This support could be provided in a pull-out model that would address specific requisite academic skills needed for successful completion of a task in the CTE classrooms, or it might be direct support in the CTE lab where the students with disabilities require assistance to complete a project or task. The special education teacher would also provide support to the CTE instructor whenever modification of material or instruction was required. This collaborative approach would assist the students with disabilities obtain mastery of skills that will benefit their future employment options.

The CTE instructor provides the specific occupational instruction to the student with disabilities. This instruction is provided in the form of classroom instruction that addresses the theory behind the skill(s) being taught and the applied or hands-on instruction in the lab or shop environment. The CTE instructor also provides an environment where there is an emphasis on employment skills necessary for success in the world of work. Exposure to these employment skills is beneficial for future success. Students with disabilities have the opportunity to develop and practice these skills in the safe environment of the classroom. The instructors also provide career awareness by connecting the skills learned in the CTE classroom environment to those needed by the employer in the local area. As the student with disabilities prepares to exit the program and move into either employment or additional training at the postsecondary level the CTE instructor can provide crucial information regarding the students' mastery level and

competencies achieved while in the program. CTE instructors can also provide assistance in job placement upon graduation from either the secondary or postsecondary level, due to their ties within industry and their reputations as reliable sources for highly trained and valued employees.

Vocational Rehabilitation Counselors provide the third layer of support for students transitioning from CTE classes at the secondary level to training opportunities at the postsecondary level or career technical colleges. Vocational rehabilitation could provide the support necessary for the students to obtain books or equipment required for the CTE training programs at the postsecondary level. Assistance in job placement upon the students' exiting the program or assistance to the future employer addressing any modifications or supports required by the students as they enter the workforce may be provided. These supports could be in the form of support with transportation to and from work or with childcare needs.

The student with disabilities benefits not only from the support systems offered by special education, the CTE instructor, and vocational rehabilitation, but benefits also from the articulated courses. Articulated courses include the concept of applied learning programs, blended secondary and postsecondary programs of study, and focus on skills necessary to be successfully employed. The natural seamless transition created with articulation promotes the movement from one educational experience to another and benefits all students, not just those with disabilities.

Barriers and Strategies of Articulation

Lerner (1987) identified the following barriers to articulation between secondary or postsecondary vocational programs: (a) breakdown of communication between the institutions, (b) lack of enthusiasm among participating members, (c) inability to sell the concept at the top level, (d) lack of leadership, (e) territorial issues between staff, (f) elitist attitude from post-secondary programs, and (g) reluctance to change. These barriers are an ongoing problem for many consortiums that are working to encourage and maintain articulation agreements between their participating institutions. To overcome these issues it is important to develop a strong leadership structure within the consortium. This leadership can provide direction for the group by maintaining regular and productive communication through scheduled meetings and communications via e-mails, web pages, or dissemination of news letters that keep all members informed of articulation efforts. By promoting a "student first" attitude and providing opportunities for administrators and faculty from both institutions to work together, issues such as "turf", reluctance to change, or elitist attitude can be impacted in a positive way. By emphasizing the importance to ensure that curricula at both ends are competency-based, institutions can focus on rearranging sequences rather than content (Lerner, 1987). Since Lerner's study, a majority of states have instituted policies to facilitate transfers of students, but this transfer has focused on the transfer from community colleges to 4-year institutions (Education Commission of the States, 2001): 30 states have written transfer and articulation policy into legislation, and 40 states have established statewide cooperative agreements among institutions or departments. Table 5 shows transfer and articulation policy percentages.

Table 5

Transfer and Articulation Policies, Full-Time-Equivalent Fall Enrollment, and Percentage Distribution of Enrollment in Public 2-Year Institutions By State: 2000

State	Legislation	Cooperative Agreement	Transfer Data Reporting	Incentives and Rewards For Students	Statewide Articulation Guide	Common Core Courses	Common Course Numbering	Full-Time-Equivalent Enrollment	Percentage Distribution of Enrollment
Number of states	30	40	33	18	26	23	8	3,151,809	100
Alabama	Yes	Yes	Yes	Yes	Yes	Yes		48,545	1.5
Alaska		Yes		Yes	Yes		Yes	473	0
Arizona		Yes		Yes	Yes			85,778	2.7
Arkansas	Yes		Yes					21,519	0.7
California	Yes	Yes	Yes		Yes	Yes		707,558	22.4
Colorado	Yes	Yes	Yes		Yes	Yes		41,322	1.3
Connecticut	Yes	Yes	Yes			Yes		20,934	0.7
Delaware		Yes			Yes			6,939	0.2
Florida	Yes	Yes	Yes			Yes	Yes	173,433	5.5
Georgia		Yes	Yes	Yes	Yes	Yes		66,571	2.1
Hawaii		Yes	Yes		Yes			14,996	0.5
Idaho		Yes	Yes		Yes	Yes	Yes	6,807	0.2
Illinois	Yes	Yes	Yes	Yes	Yes	Yes		186,533	5.9
Indiana	Yes	Yes						28,131	0.9
Iowa		Yes	Yes	Yes	Yes			44,717	1.4
Kansas	Yes	Yes	Yes					39,457	1.3
Kentucky	Yes		Yes	Yes	Yes			32,239	1
Louisiana	Yes	Yes	Yes		Yes	Yes		27,130	0.9
Maine								4,797	0.2
Maryland	Yes	Yes	Yes	Yes	Yes	Yes		57,367	1.8

State	Legislation	Cooperative Agreement	Transfer Data Reporting	Incentives and Rewards For Students	Statewide Articulation Guide	Common Core Courses	Common Course Numbering	Full-Time-Equivalent Enrollment	Percentage Distribution of Enrollment
Massachusetts	Yes	Yes	Yes	Yes				47,972	1.5
Michigan	Yes							101,794	3.2
Mississippi		Yes	Yes				Yes	47,245	1.5
Missouri		Yes	Yes			Yes		46,793	1.5
Nebraska	Yes	Yes			Yes	Yes		20,812	0.7
New Hampshire		Yes						5,442	0.2
New Jersey			Yes					79,367	2.5
New Mexico	Yes	Yes			Yes	Yes		29,541	0.9
New York		Yes	Yes					168,911	5.4
North Carolina	Yes	Yes	Yes	Yes	Yes	Yes		96,999	3.1
North Dakota		Yes		Yes	Yes	Yes	Yes	6,515	0.2
Ohio	Yes	Yes	Yes	Yes				92,749	2.9
Oklahoma	Yes	Yes	Yes	Yes	Yes	Yes		34,997	1.1
Oregon	Yes	Yes	Yes			Yes	Yes	46,099	1.5
Pennsylvania		Yes	Yes		Yes			58,759	1.9
Rhode Island	Yes	Yes	Yes		Yes			8,650	0.3
South Carolina	Yes		Yes	Yes	Yes			41,804	1.3
South Dakota	Yes	Yes		Yes		Yes		4,193	0.1
Tennessee	Yes	Yes	Yes					53,146	1.7
Texas	Yes	Yes	Yes			Yes	Yes	268,057	8.5
Utah	Yes	Yes			Yes	Yes		16,454	0.5
Vermont		Yes				Yes		1,845	0.1
Virginia	Yes	Yes	Yes	Yes	Yes			72,913	2.3
Washington	Yes	Yes	Yes	Yes		Yes		114,754	3.6
West Virginia	Yes	Yes						3,969	0.1
Wisconsin			Yes		Yes	Yes		56,195	1.8
Wyoming	Yes	Yes	Yes	Yes	Yes		Yes	10,588	0.3

NOTE: No information was available for Minnesota, Montana, or Nevada. Total enrollment shown here excludes 89,535 students enrolled in these states. The District of Columbia has no separate community college system. Blank cells indicate that the state did not have that policy. See supplemental note 3 for more information about the Integrated Postsecondary Education Data System (IPEDS). See supplemental note 8 for more information about classification of postsecondary education institutions. See supplemental note 10 for more information about state transfer and articulation policies for community college students.

SOURCE: Education Commission of the States. (2001, February). Transfer and Articulation Policies. This information is the sole property of Education Commission of the States, copyright 2001. All rights reserved. Used with permission. Retrieved November 4, 2004, from http://www.ecs.org/clearinghouse/23/75/2375.htm; and U.S. Department of Education, National Center for Education Statistics (NCES). (2003). *Digest of Education Statistics 2002* (NCES 2003–060), table 201. Data from U.S. Department of Education, NCES, 2000 Integrated Postsecondary Education Data System (IPEDS), "Fall Enrollment Survey" (IPEDS-EF:00).

To monitor success, 33 states require institutions to report transfer data. Twenty-six states have developed statewide articulation guides that describe transfer requirements and procedures. Programs to track the use of articulation are in place, but there is no current tracking system that observes the impact of articulation from the secondary level to post-secondary level.

Best Practices

Articulation offers the opportunity for all high school students to engage in educational experiences that will transfer to postsecondary institutions (D'Amico, 1991; Plank, 2001; Silverberg et al., 2004; Wagner, Blackorby, Cameto, Hebbeler, & Newman, 1993). Concurrent/ dual enrollment is one service delivery option that has proven successful for all participants. This transfer of credit may come in the form of taking college-level courses while attending high school, allowing students to simultaneously earn credit at both the secondary and postsecondary institution. Institutions benefit by sharing faculty and facilities so that there is a wider spectrum of services available to the student body. The student benefits by having a foot in both worlds, the high school and the postsecondary institution. Exposure to the learning expectations of the postsecondary institution allows natural maturation of the student to occur, resulting in an increased understanding of what will be expected upon graduation. For students with disabilities the support provided from dual enrollment will ease the final transition from secondary to post-secondary educational opportunities.

The teacher-to-teacher partnership model is also utilized. This model provides the opportunity for teachers at both levels to collaborate (Rojewski, 2002; Hawkins, 2002).

This collaboration ensures alignment of courses that are articulated. The teachers identify the occupational, academic, and employability competencies that must be developed during the high schools years and the two years of an associate degree, assuring the development of a seamless curriculum. This delivery model allows teachers at both institutions to jointly discuss a variety of their subject-area issues and concerns and discuss how to deliver the curriculum while building on local strengths. By opening this door of communication there is an opportunity to agree upon possible solutions that will assist in the development of a seamless transition for all students. The faculty members may make decisions with respect to issues that involve sharing facilities, classrooms laboratories, and equipment between the two institutions. This may result in the high school students being bussed to post-secondary institutions to use state-of-the-art equipment, thus avoiding the duplication of expensive resources. Exposure to instructors or facilities at both institutions increases the student's level of comfort with new educational experiences and will assist students as they progress through the selected training program (Proctor & McElvey, 2001).

There are many factors that contribute to the interest in developing a collaborative relationship between high schools and colleges. There is an increased awareness of the need to enhance articulation between the secondary and postsecondary level institutions especially when facing the challenges of serving at-risk students, women and minorities. These special populations represent disabilities that must be addressed by both levels of education. Collaboration offers a solution to the challenges faced when serving these diverse populations.

The development of well-articulated and integrated curricula requires collaborative planning among school administrators, academic and CTE teachers, employers, and labor unions (Just & Adams, 1997). School administrators facilitate the process by promoting the interaction among teachers across disciplines and between institutions. Administrators can also assist the process by providing time for teachers to work together on curriculum issues or participate in professional development that will capitalize on the articulation process. Teachers need the opportunity to work together to develop alternative instructional strategies. This time may be provided during the summer so that teachers can also work with employers or local labor unions to develop a curriculum that integrates applied academics with local work-based skill sets required by employers. The collaboration between education and employment also expands the opportunity for work-based learning opportunities that will expand on the academics taught in the articulated programs. Local employers or unions provide support and information regarding how concepts learned in the classroom are applied in the workplace. The employment arena may provide structured work-based learning that can enhance the school-based instruction by giving students the opportunity to try out their newly acquired knowledge and skills in a real-world setting (Just & Adams, 1997). This collaboration can assist in the development of skill standards needed by particular industries so that these job profiles will help educators teach what a particular industry expects their workers to know and be able to perform.

Finally, an enrichment model may be provided that offers enrichment opportunities for the overall educational experience of the learner. These enrichment

opportunities are connected to the articulated courses. Students in these courses may participate in job shadowing opportunities, apprentice opportunities or an opportunity to continue their learning experience by working on higher level academics or in advanced training programs that build on the skill set they have developed while at the secondary level. By participating in these enrichment opportunities students begin to expand their knowledge beyond the educational experiences at the secondary level and develop networking opportunities. These contacts in the world of work can be beneficial upon graduation and assist the student with employment options (Doren & Benz, 1998; D'Amico, 1984; Rosenbaum, 2004; Wagner et al., 1993).

Research on the Effectiveness of Articulation

The major question, "Does Tech Prep articulation really work to provide the anticipated benefits to students?" has not been researched. Few studies have evaluated the availability of articulation agreements and types of programs providing collaboration between secondary and postsecondary institutions, but none have researched the benefits to students. Hayes (1995) surveyed the extent to which the states had implemented articulation agreements as part of their Tech Prep programs. Hayes reported that although 84% of the responding states had some form of articulation agreement in place, only 46% reported having a credit-driven agreement that established the possibility of students receiving credit for courses taken while at the secondary level (as cited by Pucel & Sundre, 1999). Hershey, Silverberg, and Owens (1995) studied the diverse approaches to Tech Prep in ten sites across the United States, and results from their study suggested that progress was being made toward implementing the Tech Prep program through

successful collaboration between secondary and postsecondary facilities. However, they questioned whether these programs were making long-term contributions that actually assisted students in achieving the eight major benefits identified by the USDE in 1994. Results from their study suggested that articulation agreements represented plans for what is to be done rather than what is being done. Grubb and Bragg (1997) also suggested that "how Tech Prep initiatives affect teaching and learning at the classroom level is less clear," (p. 7) than the drive to establish the programs (as cited in Pucel & Sundre, 1999).

Pucel and Sundre (1999) studied the extent to which articulated Tech Prep programs are actually being implemented and monitored to ensure that the suggested student benefits are being achieved as students matriculate from the secondary to postsecondary level. The study examined:

- whether administrators and instructors who develop and implement the secondary-postsecondary articulation agreements are knowledgeable about Tech Prep;
- whether administrators and instructors who are responsible for implementing articulation agreements clearly understand the components and requirements of articulation agreements; and
- whether and to what extent postsecondary institutions actually implement their articulation agreements by modifying their curricula and providing the anticipated benefits to Tech Prep students. (Pucel & Sundre, 1999)

Using an expertise-oriented evaluation model, Pucel and Sundre developed a qualitative interview with the assistance of an advisory committee. The committee was comprised of state-wide secondary and postsecondary Tech Prep coordinators; administrators; instructors; the Department of Children, Families, and Learning; the Minnesota State Colleges and Universities; and project personnel from the University of Minnesota. The instrument consisted of 33-items and took 60-90 minutes to administer. A Minnesota graduate student conducted all the interviews and collected the data. Data were gathered in February and March of 1998. The total sample size was 32, with a total of eight consortia and eight CTE areas represented. All personnel from a given consortium were interviewed on the same day.

Data collected from the survey suggested that administrators and instructors seemed to understand the intent of articulation with postsecondary programs, but little attention was given to whether the programs complied with the terms of the articulation agreement once it was established between the two institutions. Pucel and Sundre did not define anticipated benefits to Tech Prep students as an observable outcome; rather they based their assumptions on attitudes and perceptions of the stakeholders interviewed in the study. Moreover, most consortiums participating in the study had no formal process to monitor and ensure compliance with transfer and curriculum agreements. When asked if student completion of programs was more efficient for students articulating from secondary to postsecondary programs only one respondent indicated that this was the case. In fact consortiums made no effort to identify Tech Prep students once they entered the postsecondary institutions nor did they make adjustments to their postsecondary

programs of study based on their courses at the secondary level. The results of Pucel and Sundre's study indicated that the programs were not achieving some of the basic goals spelled out by the USDE for Tech Prep articulated programs. Students were not experiencing the benefit of progressing more efficiently through a seamless, non-duplicative curriculum into a technical area on their way to their career goals.

The findings from this study cannot be generalized to other Tech Prep programs and are only considered the perception and attitudes of stakeholders at the institutions. The study did not include the perceptions or attitudes of students who participated in the Tech Prep programs. It is worthy to note that those students who would benefit were not included in the study. To evaluate and document the merits of the articulation agreement all stakeholders should be included. The inclusion of students would provide the opportunity to reflect the multiple realities of the administrators, instructors, and participants. In order for programs to be fully evaluated it is essential that the students, one of the most critical stakeholders and participants, be included in the study.

Although many benefits of articulation have been identified, only two studies were found that examined articulation. One of the studies evaluated the number of articulation agreements and types of programs available, but did not examine the effect of articulation on students (Hershey, Silverberg, & Owens, 1995; Hayes, 1995 as cited by Pucel & Sundre, 1999). The other study examined the attitudes and perceptions of the stakeholders that implemented articulation agreements, but did not include students who were impacted by articulation (Pucel & Sundre, 1999). While the benefits of articulation appear to be reasonable, no current research is available to support or discount the

accepted benefits of articulation. It has been assumed that the programs designed to implement articulation agreements have been working, but no data to support the value or effectiveness of these programs has been collected.

Implications for Practice

There are many practices in education that are reputable and acknowledged as being effective in bringing about positive outcomes for students. Foremost is the practice of collaboration or a commitment to communicate and build alliances between school systems, local governments, career technical training programs at community colleges and representatives from industry. Since the decisions and choices that youth, teens, and young adults make early in life will impact their future job opportunities and the future of our society, it is imperative that they understand the opportunities available through career technical training and the benefits of articulation. Fortunately, articulation and alignment of courses from the high school to career technical colleges and community colleges is already in place and should assist students to achieve positive outcomes; however, these options are not fully utilized. Students are often unaware of how articulation of these courses will reduce duplication of learning at the post-secondary level. Students need to be aware of this opportunity and its impact on their future employment options. It is important to refocus the effort of stakeholders to communicate and encourage participation in programs currently in place that provide smoother transition from secondary to post-secondary programs and into the workforce.

Work, career, and employment are intrinsic elements of adulthood. Providing students with skills and tools that assist them in obtaining these goals is essential to developing the ability to work and earn a living. Although transition services have been required under IDEA since 1990, there is still a need for strategies that will bridge the gap between education and employment for the student with disabilities. The utilization of articulation agreements between secondary and postsecondary institutions is one such tool that successfully bridges the gap between academic and vocational learning to future training and/or employment.

Transition is intended to make post-school outcomes more successful for students with disabilities. It is critical that students be prepared for today's employers. Employers are looking for quick and immediate proof of an applicant's qualifications, and this proof can be provided through documentation of skills mastered in CTE programs. The development of skills learned in the CTE classes empowers students as they identify strengths and pursue individual interests as well as recognize and strengthen any areas of weakness. The credits earned and articulated will be the tool that provides students with disabilities the competitive edge needed for transition into the future.

A valuable tool that educators and students need to utilize is articulation. However, limited data indicates that less than 3% of Georgia freshmen entering the Career Technical Colleges take advantage of articulation. This study will explore the reasons why students do not utilize the articulation agreements in place to facilitate their transition from the secondary educational environment to the postsecondary training

required for successful employment in the future. This effort is essential to preparing the youth for tomorrows' workforce.

Table 6

Key Vocational Education and Special Education Legislation to Support Training Opportunities and Transition Services for Students with Disabilities

Legislation	**Significance**
Vocational Education Act of 1963 (PL 88-210)	Established vocational education opportunities for those with academic, socioeconomic, and other disabilities. Included 10% of funds for the development of experimental programs to better serve students with disabilities.
Vocational Education Amendments of 1968 (PL 90-576)	Re-emphasized the thrust of the 1963 Vocational Education Act and set aside 20% of funds for students with disadvantages and 10% of funds for students with disabilities.
Education of All Handicapped Children Act of 1975 (PL 94-142)	Established a national effort in providing free appropriate public education (FAPE) for all children with disabilities aged 3-21. Included an individualized educational program (IEP), least restrictive environment, and due process with procedural safeguards for all students with a disability.
Education Handicapped Act Amendments of 1983 (PL 98-199)	Established section 602, "Secondary Education and Transitional Services for Handicapped Youth," which addressed transition from school to postsecondary education, employment, and adult living. Funds were made available for demonstration projects.
Carl D. Perkins Vocational Education Act of 1984 (PL 98-524)	Assured equal access to high-quality vocational programs to special population students, including those with disabilities; disadvantaged, nontraditional students; and adults needing training or retraining.

(table continues)

Table 6 (continued)

Legislation	Significance
Carl D. Perkins Vocational and Applied Technology Education Act of 1990 (PL 101-392)	Eliminated special populations' set-aside funding and allowed more flexibility to state and local agencies to better serve special population students. Required LEAs to provide information to students prior to eighth-grade concerning career choices and opportunities via career counseling efforts.
Individuals with Disabilities Education Act of 1990 (PL 101-476)	Established mandated transitional services to include a coordinated set of activities with an outcome oriented process. All students age 16 years and older (aged 14 years where appropriate) to have a written transition plan (ITP) as a component of the IEP.
IDEA Amendments of 1997 (PL 105-17)	Continued and expanded the transition mandates of IDEA 1990 to include ITPs with a focus on a child's course of study, starting at age 14, to be updated annually and, at age 16, to focus on statements of transitional services and specific outcomes. Age of majority declaration was included as part of the IEP process.
Carl D. Perkins Vocational Technology Education Act of 1998 (PL 105-332)	Established guidelines and increased statement of accountability to make certain equal access for special population students. Access was to include recruitment, enrollment, and placement activities. Expanded special population definition concerning single parents.

SOURCE: Sarkees-Wircenski, M., and Scott, J.L. (1995). Vocational special needs (2nd ed.). Homewood, IL: American Technical Publishers, Inc. Printed with permission from the authors.

Table 7

Types and Availability of Vocational Programs in 2000

CTE Program Areas	Percentage of High Schools
Business	57.51
Technology and communications	43.03
Child care and education	33.18
Trade and industry	31.96
Agriculture and renewable resources	29.54
Health care	27.78
Marketing and distribution	27.54
Food service and hospitality	27.00
Personal and other services	12.24
Public and protective services	7.49

Source: Stone III, J. R., Kowske, B. J., & Alfeld, C. (DATE). Career and Technical Education in the Late 1990s: A Descriptive Study. *Journal of Vocational Education Research, 29*(3), 206. Printed with permission from the authors.

III. METHODOLOGY

Currently, attention is focused on how high school programs can foster successful transition to post school education. Articulation is the commitment to communicate and build alliances between school systems and career technical training programs at technical colleges that will benefit student transition to post-secondary options. This study was designed to systematically gather and analyze information about student awareness and understanding of articulation.

In addition to quantitative data obtained from a survey, the researcher followed up with *informal* interviews, collecting qualitative data from a cross section of study participants. This qualitative data contributed to the study by identifying patterns and themes as observed from the interviews. The worth of the study was the ability to generate new, or support existing theory, of student knowledge regarding articulation and its benefits, and the *perceptions of CTE*.

This chapter begins with a discussion of the West Georgia Tech Prep Consortium and the collection of data for the consortium. Description of the instruments and the intervention follow. Finally, research methodology and design for the study are presented. Specifically, sample selection, sample identification, description of the independent and dependent variable measures, and the statistical procedures employed for the investigation are described.

Overview of the West Georgia Tech Prep Consortium

West Georgia Tech Prep Consortium was formed in 2002 as a result of a grant received from the federal government through the Carl D. Perkins Vocational and Technical Education Act. The consortium was established to provide support and alignment of programs at the high school level in Meriwether, Heard and Troup Counties with the West Georgia Technical College and industry within the West Georgia area. Working as a team, members from industry, the chamber of commerce, the Regional Educational Support Association (RESA), middle schools, high schools, and the technical college established the following basic goals for the consortium to address over a four year period from 2002-2006 (see Table 8).

Table 8

West Georgia Tech Prep Consortium's Goals from 2002-2006

Strand	**Goal**	**Objective**
Leadership and Commitment	1. To strengthen leadership and commitment of Tech Prep throughout consortium	Continue working with high school students and staff to promote Tech Prep
Career Guidance	2. To strengthen career guidance within the consortium	Distribute information to high school students and teachers on Tech Prep career opportunities
Professional Development	3. To strengthen professional development within the consortium	Provide opportunities for professional development

(table continues)

Table 8 (continued)

Strand	Goal	Objective
Curriculum Integration and Contextual Learning	4.To strengthen curriculum integration and contextual learning within the consortium	To bring business and education together
Curriculum Articulation and Alignment	5. To strengthen alignment and articulation within the consortium	Promote articulated courses
Evaluation and Assessment	6. To develop a method for the evaluation of the Tech Prep program in the consortium	To measure grant effectiveness

Although the Consortium met on a regular basis, a strategic planning committee was formed and met on July 7, 2005, to review the consortium's four year goals for 2002-2006. At the meeting concern, was expressed regarding *articulation* (Goal 5). Consortium members had developed and implemented policy changes designed to streamline educational services between the high schools and the technical college in the hopes of improving student outcomes, specifically aligning coursework offered at the high school level with introductory courses offered at the technical college. The alignment of these courses allowed students to earn post-secondary credits while still in high school. Plus, by integrating and strengthening the curriculum between the two institutions, contextual learning would be increased and students would benefit. To ensure this curriculum integration, articulation agreements were created to help bridge the gap between secondary and post-secondary education, creating a continuum of educational experiences in the hopes that articulation of classes would assist students' transition to postsecondary educational and training programs. The ultimate goal of the consortium

was to promote learning at the secondary and postsecondary institutions in an effort to increase positive outcomes for students in the west Georgia area and assist students as they moved from educational institutions into the local workforce. Articulation of course work from secondary to post-secondary programs could have a profound impact on the transition of students with disabilities to post-secondary programs and training opportunities that could impact future career paths.

However, despite the articulation process currently in place, its impact on transitioning students from secondary to postsecondary programs was underutilized. Although students had the opportunity to earn credits at both institutions, West Georgia Technical College had less than 1% of their entering freshmen take advantage of the articulation agreements (WGTC Enrollment records, 2003-2006). Based on the recommendations of the strategic planning committee the consortium decided data needed to be collected pertaining to *articulation* (Goal 5) in an effort to promote the articulation of courses by students graduating from the high schools within the consortium. The Consortia also recognized the need to evaluate and assess (Goal 6) the programs that were implemented under their policy directives.

Members of the consortium met again on August 25, 2005, to review the recommendations outlined at the July strategic planning meeting. The recommendations from the strategic planning meeting led to this research. The strategic planning committee recommended collection of data in order to obtain information regarding what students knew about articulation and the benefits of career technical classes. Once data was collected and analyzed, the committee recommended developing strategies that would increase utilization of the articulation agreements.

Instrumentation

This section describes the two instruments used in this study. First, the West Georgia Tech Prep Consortium (WGTPC) articulation survey is discussed. Included in this discussion is the development of the instrument and summary of results that were used in the development of the intervention. The second instrument, the informal interview, is also described. A rationale of the development of the follow- up questions used in the informal interview is provided.

West Georgia Tech Prep Articulation Survey

The first recommendation of the consortium (data collection about student knowledge and perception of articulation) led to the development of the articulation survey. Due to lack of documented information about students' knowledge of articulation, it was important to assess what students knew about *articulation* (Goal 5) to establish a baseline for future comparisons. This needs assessment of the articulation program provided information related to the *evaluation and assessment* (Goal 6) of grant effectiveness for the consortium. The needs assessment guided the consortium in the development of appropriate strategies to increase the utilization of articulation.

Survey development. A draft of the WGTC Articulation Survey was developed by the researcher, who is a member of the consortium. The survey was designed to solicit relatively structured responses, utilizing a five-point Likert scale of *strongly disagree* [1] to *strongly agree* [5]. The Likert scale was selected because it was the most appropriate method to measure student knowledge. The survey contained three parts: (a) activity-related data, (b) structured responses, and (c) opened-ended responses. The *activity-*

related data addressed student participation in career guidance, work experience, vocational assessment, and course involvement at the secondary and postsecondary level. The *structured responses* incorporated in the survey were aligned with the following domains: (a) program of study, (b) stakeholders, (c) career technical classes, (d) career guidance, (e) articulation, and (f) technical college. See Table 9 for an explanation of each domain.

Table 9

The Six Domains Addressed in the Survey

Articulation Survey

Domains	Descriptors
1. Program of Study	Student responses reflected awareness of the career technical program. Perceived sense of preparedness for future employment, post-secondary educational opportunities and changes they would recommend to the career technical program of study.
2. Career Guidance	Student responses reflected the level of participation, knowledge, awareness of future options and sense of direction for future goals.
3. Career Technical Classes	Student responses reflected perception of how the career technical classes assisted in preparation for future goals.
4. Stakeholders	Student responses reflected the perceived support from teachers, counselors, and technical colleges.
5. Technical College	Student responses reflected perceived value of taking courses that were taught by the technical college personnel.
6. Articulation	Student responses reflected the perceived knowledge, value and impact articulation had on future goals.

The primary focus of this study was to obtain information regarding student knowledge of *articulation* (Domain 6) and student perceptions of *career technical classes* (Domain 3). These *domains* aligned with the concerns expressed by the strategic planning committee. For the purpose of this study, the researcher focused solely on the student responses that corresponded to these domains.

Information regarding students' knowledge and perception of *articulation* (Domain 6) was addressed in eight questions that examined this domain. These questions asked students what they knew about articulation and allowed them to share information regarding whether they perceived articulation was beneficial or non-beneficial, whether they intended to utilize articulation, and whether additional information about articulation was needed. Students were encouraged to identify the courses they intended to articulate in an open-ended question located at the end of the survey.

The consortium was also interested in obtaining information regarding students' perception of *career technical classes* (Domain 3); ten items of the survey focused on this domain. These questions allowed students to share information regarding whether they thought participation in the career technical classes prepared them for future employment, if the CTE classes were relevant to future goals, if exposure to hands-on training in the CTE classes was beneficial to their educational experience, and if the CTE classes aligned with their career interest and goals. Open-ended questions were included so that students could comment on CTE classes, make recommendations, or suggest improvements to the educational opportunities offered through the CTE classes.

Additional information pertaining to *articulation* and *CTE classes* was obtained through open-ended questions included at the end of the survey. These questions were incorporated into the survey in hopes that useful additional information would be provided and students would have the opportunity to voice their views regarding changes they would make to *articulation* or *career technical classes* (see appendix A).

Content validity. In order to examine the content validity of the instrument the survey was reviewed by experts within the consortium and by an outside statistician. The

first group of experts was comprised of representatives from industry, education and the community. The group represented over 90 combined years of experience in education (school counselors, career technical instructors, director of CTE programs, and CTE coordinators, educators), 18 combined years in industry (human resource representatives, corporation representative), and 15 combined years in community representatives (Chamber of Commerce representative, Workforce Development representative). Members of this group represented a cross section of expertise within the educational community, the local industry and local community leaders. During a board meeting copies of the surveys were distributed to all members in attendance, 20 surveys were distributed. The participants were asked to identify unclear items, and suggest changes they felt to be necessary. The members were allowed time to review the surveys. At their suggestion, the term *vocational* was replaced by *career technical*. As a result, 11 of the items on the survey were reworded to remove the stigma often associated with the term *vocational*. Once the recommendations suggested by the committee were addressed by the researcher, the committee members agreed that the survey questions accurately evaluated the domains.

In addition to the input from experts within the field, the survey was evaluated by a statistician. The statistician has a Ph.D. in Educational Research Methodology and Statistics from a nationally recognized research institute and has taught graduate courses in measurement, evaluation, and statistics for the past seventeen years. As a recognized expert in his field he has published in journals and authored multiple books dealing with student and teacher assessment, teacher effectiveness, and research methodology issues. After reviews and revisions dealing with structural aspects of the survey, it was deemed

acceptable by the statistician and ready to be published to the web site for subject participation and data collection.

Concurrent validity. The researcher was unable to analyze concurrent validity since there are no other articulation surveys in the literature base. The absence of an instrument of this type, led the researcher to develop the survey to collect crucial input from the students who would benefit from participation in articulation of courses.

Reliability. Reliability is the "consistency" of a measure. The researcher used an internal consistency reliability estimation based on the pre-survey to estimate reliability. Evaluating the total items, combining the domains on the pretest the researcher used a Cronbach's Alpha to obtain a total score. The constructs measured by the survey when correlated had a Cronbach's Alpha of *.9045*. This analysis supports that the results are consistent for different items for the same construct within the measure.

Survey summary. As members of the West Georgia Tech Prep Consortium, each system had agreed to support and provide information to the consortium, so individual consent forms were not required by the systems or the consortium. There were 900 students in CTE classes who were eligible for articulation through the participating consortium members. All instructors of articulated Career Technical Education (CTE) classes and articulated core classes were given access to the survey and asked to have the students in their classes complete the survey. Instructors took their classes to computer labs where a direct link was provided so that students could access and complete the on-line survey. Completion of the survey took 15 to 20 minutes, minimizing the interruption of instructional time. Students logged onto computers using their student identification number.

Students' responses to the survey from the participating members of the consortium were aggregated by WGTC's web master. Information collected from students was identified by an ID number assigned by the web master and was not associated with any particular teacher, school, or district. All identifying data were removed by the web master to assure the anonymity of all participants involved in the survey.

A total of 200 surveys were completed. Although the participation was less than the consortium had hoped, the consortium members were pleased to have this input to review. Analysis of the original surveys provided a baseline for future comparisons.

Analyzing participant responses to questions dealing with *articulation* (Domain 6) revealed interesting results. Review of student responses to the open-ended question "What information would you like to have regarding articulation" indicated that 166 (83%) of the original survey responders did not recognize the term articulation and requested information. Sixteen (8%) of the participants responded positively to the question, "I understand how articulation works." Ten (5%) of the respondents to the question, "I think I will benefit from articulation of high school classes to courses offered at the Career Technical College," indicated they might articulate courses. Thirty-seven (18.5%) respondents indicated on the open-ended question "What program of study do you intend to pursue at the Career Technical College," an interest in attending a technical college after graduation from high school. The majority of the participants (163, 81.5%) indicated a preference to attend a four year college or university upon graduation.

When reviewing the data dealing with the value of *career technical classes* (Domain 3) participant responses were more favorable. One hundred forty-eight (74%)

indicated that the training in the career technical classes matched their abilities and interest. Sixty-five (32.5%) respondents felt that "the amount of time spent in career technical classes is adequate." Student responses to the questions "I feel the career technical classes are appropriate for my career interest and goals" and "I feel the career technical program is preparing me for post-secondary educational opportunities" were less favorable with only 33 (16.5%) respondents agreeing that the CTE classes aligned with their future goals and educational plans.

Overall, the students responding to the survey questions had little to no knowledge of what *articulation* was and did not consider the technical college as a viable postsecondary option for them upon graduation from high school; rather they intended to go to a four year college after graduation from high school. Although student responses to questions regarding the *career technical classes* indicated they enjoyed and valued the classes, responses linking this training to post-secondary options was not positive. The data collected from the original surveys provided valuable information for the consortium and provided guidance in the recommendation of strategies needed to address the areas of concern expressed originally by the strategic planning committee in July, 2005 (see treatment section).

Follow-up Informal Interview

To provide additional data regarding student knowledge of *articulation* the researcher was interested in employing a follow-up interview with a small sample of students. The follow-up interviews provided qualitative information.

One major advantage of qualitative research is the ability to generate theory through discovery; this is the general tenet of Glasser and Strauss' (1967) concept of

grounded theory. Grounded theory is centered on the philosophy of inductive discovery. The data gathered from the interviews would allow the researcher to identify patterns and themes that could provide a deeper understanding of student knowledge of articulation.

Primary concerns expressed by the consortium were whether participating in the workshop was effective in increasing student knowledge, whether participants could identify specifically what was learned, and if sources for additional assistance regarding articulation were identified by participants. Questions developed for the follow-up informal interview were based on these concerns expressed by the consortium regarding increasing student knowledge of the benefits of articulation. The researcher developed a total of 8 questions for the informal interview. Five questions addressed knowledge of *articulation* (Domain 6) obtained from the workshop. Two questions addressed student perceptions of the benefits of *articulation*. One question asked students who would be a source of support if they had additional questions regarding *articulation*. The researcher submitted the proposed interview questions to a panel of four university professors and consortium members who reviewed each question. The professors recommended grouping the questions into two categories, workshop effects and student views. The consortium members, based on their expertise in the field, approved the proposed questions for use with the follow-up interviews.

Structure of interview. The researcher began the interview by stating: "Last spring you participated in a workshop that explained articulation. West Georgia Tech Prep Consortium would like to follow up with students who participated in the workshop and ask them a few questions about articulation. The goal of the consortium is to gather information so that services provided to the high school students here in Troup County

can be improved." The following questions dealing with student knowledge of *articulation* (Domain 6) were asked during the interview: (a) Tell me what you know about articulation, (b) How did participating in the workshop change your understanding of articulation? (c) What information about articulation was most beneficial? (d) Who or what has been your best source for information about your courses that might articulate? (e) If you had additional questions, who would you ask for help regarding articulation requirements?

Another concern of the consortium addressed the limited utilization of articulation by students who transitioned from high schools to post-secondary programs. In an effort to determine whether students viewed articulation as beneficial the researcher included questions in the interview that addressed this concern. The following questions were asked by the interviewer during the interview: (a) How do you think knowing about articulation might benefit students at the high school level? and (b) How would articulation of courses to the technical college benefit students? The researcher concluded the interview by stating: "Thank you for your time and help today. The information you have shared will help the consortium improve their services to students in Troup County."

The informal interview conducted by the researcher collected qualitative data pertaining to the knowledge retained by participants of the piloted workshop regarding *articulation*. The qualitative data collected from the follow-up interview provided supporting evidence documenting student knowledge regarding articulation obtained from the strategies recommended by the strategic planning committee and the consortium members. Combining this qualitative data with the quantitative data presented a richer

picture of student knowledge toward articulation. As mentioned earlier the interview was semi-structured because the researcher followed a scripted dialog with each individual interviewed assuring consistency across the subjects interviewed. Detailed notes of each interview were kept so that trends could be observed from responses recorded.

Intervention

Articulation Workshop and Supporting Materials

The results from the original survey guided the consortium in the selection of strategies to increase the utilization of articulation. The primary goals were to increase student knowledge regarding *articulation* and the benefits of *career technical classes*. The consortium determined material needed to be developed to address these goals and a pilot program would be implemented to test the effectiveness of the application of the material. The consortium emphasized that the material be easy to understand and user friendly so that students and teachers could use the information without difficulty.

First, the researcher developed a brochure which addressed the concerns expressed by the consortium. The consortium requested that the brochure include (a) an explanation of articulation, (b) the benefits of articulation, (c) classes that could be articulated, (d) requirements for articulation, (e) personnel to provide additional assistance regarding articulation, and (f) a list of colleges that had articulation agreements (Appendix B). Members of the consortium reviewed the brochure. The consortium approved the design and format of the brochure and approved its use with the pilot program.

In addition to the brochure which could be distributed to students in the classroom or during advisement with the counselor, a visual presentation using a PowerPoint was developed. The PowerPoint provided the same information and emphasized the importance of articulation of classes, stressing that articulation would save the student time and money while working toward post-secondary training. Consortium members recommended that the PowerPoint emphasize the importance of how skills learned in career technical classes could transfer into additional training programs beyond high school, stressing that today's labor market offers a proliferation of jobs at the sub-baccalaureate level (Carnevale, 2000). The committee members wanted the PowerPoint to be brief, to the point, and easy to use. The goal, once the pilot workshop was completed and data was reviewed, was to share the PowerPoint with high school teachers and counselors as an informative tool they could use with classes or students in advisement. Finally, the members of the consortium wanted a workshop developed that could directly impact the stakeholders that would most benefit from articulation, the students.

Recognizing the importance of instructional time in high schools, the consortium realized the workshop needed to be concise and easy to use. The researcher designed the brochure and PowerPoint as the central elements of the workshop. Both elements were easy to transport and use within a classroom environment. The brochure and PowerPoint could be tailored to reflect each high school represented in the consortium. Notes included at the bottom of the PowerPoint allowed any teacher to present the PowerPoint with confidence and ease (see Appendix C).

Members of the consortium participated in a pilot of the workshop to provide direct input to the researcher. The researcher presented the PowerPoint and informative brochure that would provide students with the information regarding articulation as well as led a discussion that highlighted the key information that addressed the concerns identified by the strategic planning committee in July. Members of the consortium were encouraged to ask questions and an open discussion followed the PowerPoint presentation that lasted about 10 to 15 minutes. All committee members were given a copy of the brochure designed to use with the pilot workshop. The researcher explained that brochures could be tailored for each high school within the consortium, replacing school information so that it was linked to the appropriate high school. The members, based on their expertise, recommended the format and content of the pilot workshop and the use of the material in the workshop.

Procedures and Methodology

This section describes the procedures and methodology used in this study. First the population utilized for the study is described. Participant selection, identification and treatment group selection are discussed.

Sample Selection and Identification

Population. The sample for this study was derived from three Georgia public school systems. These school systems were located in counties in West Central Georgia: Heard, Meriwether, and Troup. Of the three school systems, there were six high schools represented. In regard to size, the six high schools had a total school enrollment for grades 9–12 of 4,997. For a breakdown of the demographics of each county school

system, see the table below. Information was collected from the Georgia Department of Education web site (http://reportcard2005.gaosa.org/k12/demographics).

Table 10

Demographic Information of High Schools that Participated in the WGTC Articulation Survey

School	Total Population 9-12 grades	% Black Students	% Hispanic Students	% White Students	% Multi-Racial Students	% Students Receiving Special Education Services
Heard County	542	11%	1%	86%	2%	12%
Meriwether County	1,113	60%	1%	38%	1%	25%
Troup County	3,342	41%	2%	54%	2%	12%

Baseline Group. In the base line group of this study, the subjects participating in the treatment were students selected from the three school systems for which data was collected utilizing the WGTC Articulation Survey. Specifically, in order for a school system to be eligible for participation in the articulation survey, the system had to be a member of the West Georgia Tech Prep Consortium. These members are: school systems from Troup County, Meriwether County, and Franklin County. Each of the counties had one county school system that served all the students within that county. All students participating in the survey were enrolled in Career Technical Classes or in academic classes that were aligned with courses at West Georgia Technical College (see Figure 5).

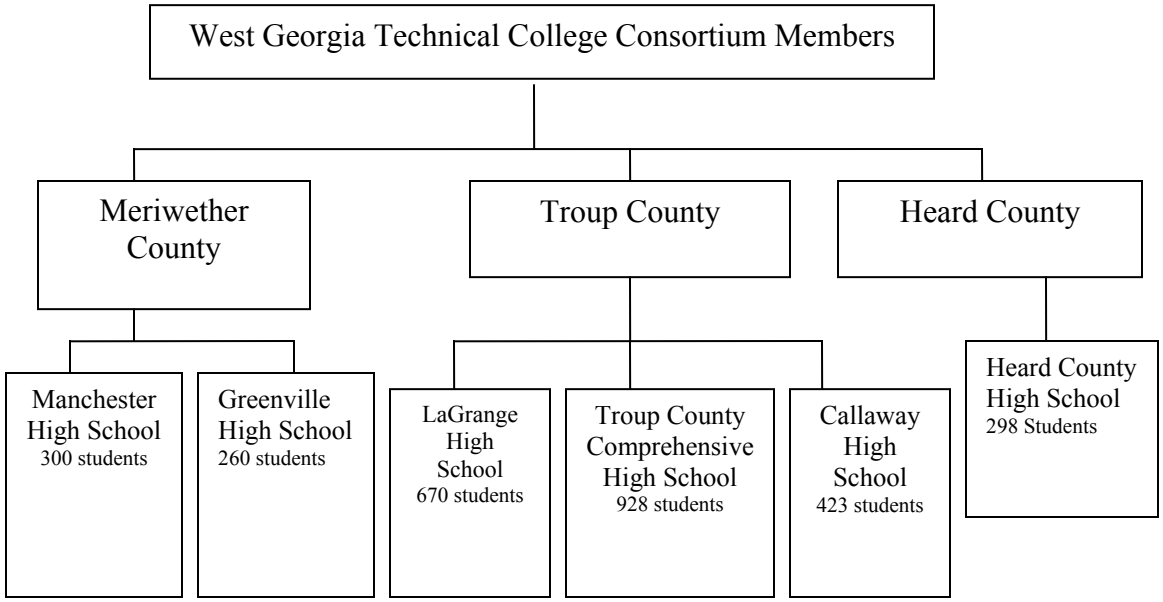

Figure 5. Visual representation of West Georgia Technical College's Consortium and the number of students working toward a tech prep diploma.

The participant population for the base line group contained high school students ranging from 15 to 19 years of age. Males and females with and without disabilities in grades 9th through 12th were represented in the population. The students were working toward a regular high school diploma within the tech prep diploma track or in the college prep diploma track with a tech prep seal. All of the participants were in Career Technical Education classes or in academic classes that articulated. Students had been enrolled in CTE and academic classes prior to the survey being conducted by the consortium which removed any influence the researcher might have had on the selection of participants for this study. As previously noted, 200 students completed the survey. Of these students, 53% (n = 106) were female and 47% (n = 94) were male. Approximately 73% (n = 146) were identified as regular education (RegEd) students and 27% (n = 54) were identified

as students with disabilities (SpEd). Fifteen percent were (n = 30) ninth graders, 60% (n = 120) tenth graders, 11% (n = 22) eleventh graders, and 14% (n = 28) twelfth graders.

Retrospective data from the survey utilized by the West Georgia Consortium was used as the database for the current study. West Georgia Technical College's web master served as the intermediary. He captured the data and sent it to the researcher. The web master removed identifying information to assure anonymity for all participants. The researcher did not have access to names or identifying information.

Treatment group. For this study the treatment group consisted of 65 ninth through twelfth graders from a high school in a mid-sized Southern city. The 65 participants were selected by the researcher because of their availability, representation of the larger sample of surveys, and the consistent environment assured by limiting the selection of subjects by selecting them from one subject with the same instructor. The instructor was recommended by the web master, who captured the original data for the consortium, because of the high percentage of students from this teacher's classes that participated in the original survey. The teacher selected taught at a participating high school within the consortium. The course was eligible to articulate to the technical college. All 65 students were taught by the instructor.

Of the 65 students, 52% (n = 34) were female and 48% (n = 31) were male. Approximately 71% (n = 46) were identified as regular education (RegEd) students and 29% (n = 19) were identified as students with disabilities (SpEd). There were 9% (n = 6) ninth graders, 57% (n = 37) tenth graders, 26% (n = 17) eleventh graders, and 8% (5) twelfth graders. For the purposes of this study grades nine and ten were combined as was

the eleven and twelve for the purposes of the statistical analysis. Figure 6 provides an overview of the study.

Follow-up interview. A cross section sampling of students who participated in the articulation workshop was utilized to identify students to participate in the follow-up interviews. Students from each category — *gender* (male/female), *classification* (regular education/special education), and *level* (10^{th}, 11^{th}, and 12^{th}) — were randomly selected by the researcher. The researcher placed student names into an excel spread sheet. Students were sorted according to two categories, regular education and special education. These two categories were subdivided into groups based on grade level and gender. The researcher minimized the column containing the student name, rendering them invisible, and selected ten participants randomly. No ninth grade subjects were included in the selection of subjects because all students participating in the piloted workshop had progressed into the next grade due to normal progression through high school.

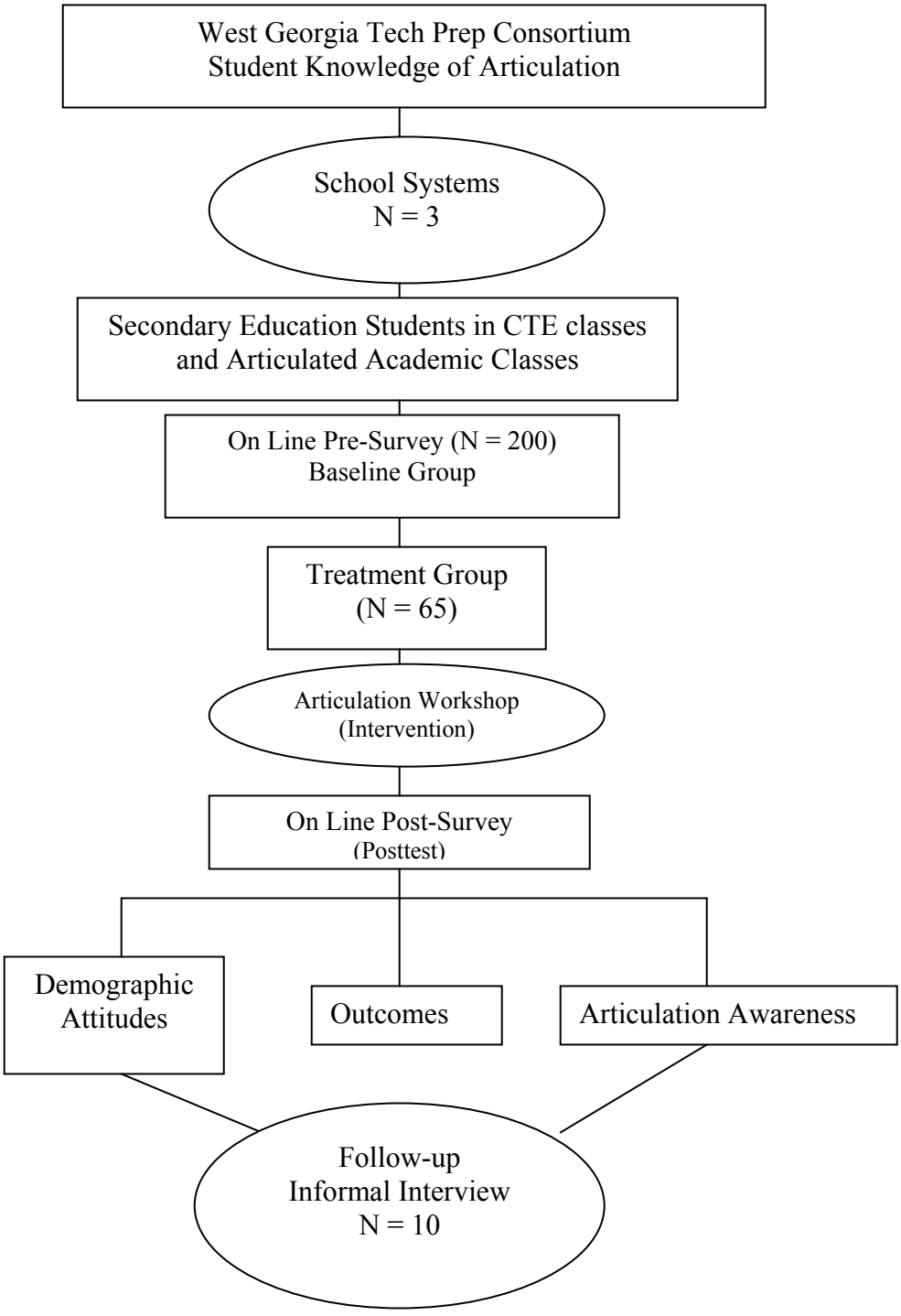

Figure 6. Overview of Study

Timeline and Procedures

This section provides a review of the activities that led to this research as well as a timeline of the studies major steps. The West Georgia Tech Prep Consortium strategic planning committee met in July, 2005, and identified concerns regarding student knowledge of *articulation* and the benefits of *career technical classes*. These concerns were presented at the August, 2005, West Georgia Tech Prep Consortium meeting. The researcher, as a member of the consortium, was assigned the task of developing an on-line survey to collect baseline data regarding student knowledge of *articulation* and the benefits of *career technical classes*. The researcher presented the proposed survey to the consortium members at the December, 2005 meeting. Following the survey's approval, the West Georgia Technical College's web master posted the survey dealing with student knowledge of articulation and CTE classes on the West Georgia Technical College's server. An electronic format of the survey was utilized to ensure easy access for participating schools in the consortium. See the following link for additional information, (http://www.elisten.com/web30/surveys/4C3DB4C17F8548A7AB8847CF512A5872).

Baseline data was collected by the web master and analyzed by the researcher in March, 2006. The researcher presented the findings to the consortium at the March, 2006, meeting. Selection of a treatment group and development of the articulation workshop were completed and presented to the consortium members for approval at the May, 2006, meeting. Implementation of the workshop with the treatment group was implemented immediately with the on-line post survey administered at the end of May, 2006. Interview questions for the follow-up informal interview were reviewed and approved by the experts within the field and consortium members in February, 2007. Follow-up

interviews with a sampling of students who participated in the May, 2006, workshop were collected the following March, 2007.

Research Design and Analysis

A causal-comparative research design was utilized to study the retrospective data collected by the consortium. This data regarding student knowledge toward articulation from the electronic survey conducted by the consortium was employed to explore (a) why high school students were not taking advantage of articulation and (b) whether the information regarding articulation provided in the workshop changed the students' perception and knowledge of the benefits of articulating classes. Through the use of an informal interview qualitative data was collected by the researcher to provide additional information that was used to identify patterns and themes reflecting student knowledge acquired from the piloted workshop.

The remainder of this chapter introduces a description of the independent and dependent variable measures. Finally, descriptions of the statistical procedures employed in this study are explained.

Research Questions

The following research questions were tested in this study:

1. Are there differences between students with and without disabilities in their understanding of how articulation works prior to the articulation workshop?

2. Do student demographics impact students' perception of the importance of career technical programs after participating in the articulation workshop?

3. Do students' perception of articulation change after participating in the articulation workshop?

4. What did participants in the articulation workshop know about articulation one year after the workshop?

For this study, student responses from two domains of the articulation survey and the follow-up interviews served as the primary data source to address the research questions. Domains from the articulation survey dealt with *Career Technical Classes* (Domain 3) and *Articulation (*Domain 6). A comparison of the estimated means of these domains was used to observe relationships between the independent and dependent variables.

Independent and Dependent Variables

Understanding of *articulation*, perceived *importance of CTE programs* on future plans, and *impact of articulation workshop* on student understanding of articulation are the three categories of variables that were explored in this study. The survey responses by question are identified under each research question in the data analysis strategies section.

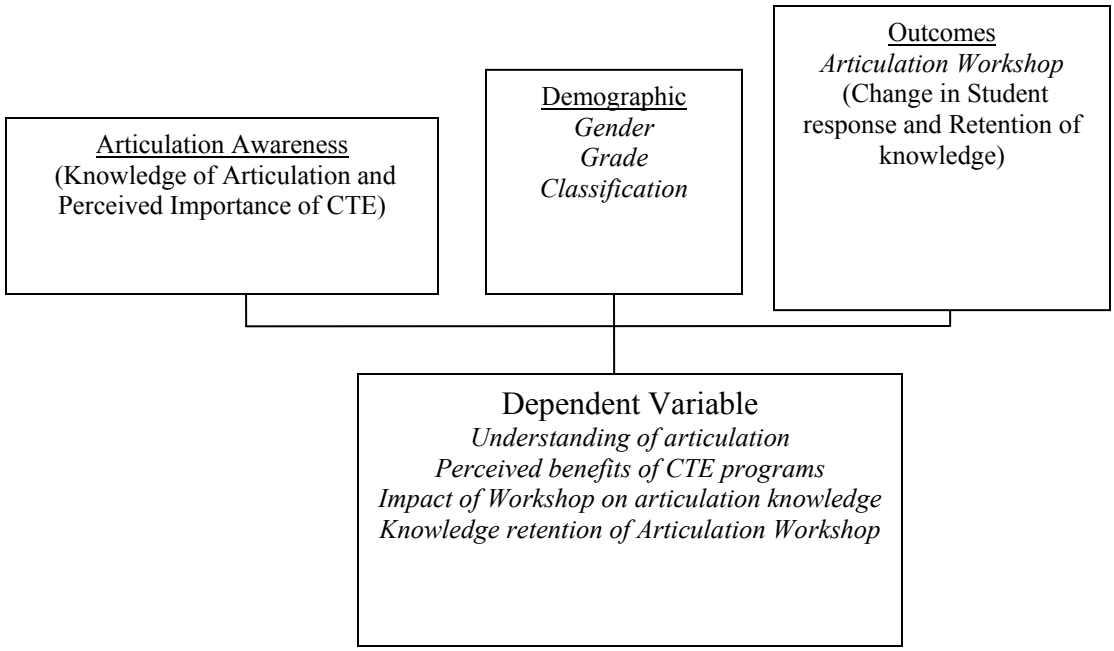

Figure 7. Visual representation of the dependent variable and subsets evaluated

Data Analysis Strategies

The researcher used the Statistical Package for Social Sciences, 11.5, 2002, (SPSS) to analyze the retrospective data set. Univariate Analysis of Variance was used for testing research question one and two, and a general linear model was used to analyze research question three. This study had two purposes (a) to describe the relationship between the dependent variables and the independent variables and (b) to attempt to establish a cause and effect between the articulation workshop and change in student knowledge of articulation.

Research Question One – Student Understanding of Articulation

To determine how students with and without disabilities varied in their knowledge of *articulation* (Domain 6) prior to the articulation workshop, an analysis of variance was

conducted with *classification* (regular ed vs. special ed) as the independent variable and *students' responses* on the survey as the dependent variable. Questions on the articulation survey that address this domain were: (a) I am familiar with articulation of career technical classes to courses offered at the career technical college, (b) I understand how articulation works, (c) I think I will benefit from articulation of high school classes to courses offered at the career technical college, (d) I think I will not benefit from articulation of high school classes to courses offered at the career technical college (which was recoded by the researcher), and (e) I think the articulation of courses between the High School and the Career Technical College is beneficial to my future goals. To obtain a score for the domain, *student understanding of articulation,* the researcher used an *estimated means* for student responses ranging from 1 to 5 on the Likert scores obtained from the survey questions addressing articulation (questions 14, 16, 17, 18, and 19). The researcher wanted to know if there was a statistically significant difference between students with and without disabilities from student responses as seen on the articulation survey.

Research Question Two – Perceived Importance of CTE Programs

To determine how students of different *genders*, *classifications,* and *grade levels* perceived the importance of *career technical programs* (Domain 3) on future plans, a repeated measure analysis of variance with one within-subject factor (time) and three between-subject factors (gender, grade level, and student classification) was conducted. The survey questions concentrated on the following aspects: (a) I feel the career technical program is preparing me to get a job, (b) I feel that my high school coursework is relevant to my future goals, (c) I feel the career technical program is preparing me for

future employment options in the community and (d) I feel the career technical program is preparing me for post secondary education opportunities. The researcher used *estimated means* obtained from the survey questions (questions 1, 2, 4, 5, 6, 9, 10, 11, 12, and 13) pertaining to articulation to compare the domain, *perceived importance of CTE programs on future plans* (Domain 3), to the differences observed between *gender*, *classification* and *grade levels*.

Research Question Three – Impact of Articulation Workshop

To determine whether student perceived importance of *articulation* (Domain 6) changed after the workshop, a Repeated Measure Analysis of Variance was conducted with the data collection points (pre vs. post survey). The dependent variables were student's *perceived importance of articulation*. The survey was given before and after the piloted articulation workshop. The researcher used a comparison of means between the student scores obtained from the articulation pre-survey and post-survey to evaluate if there were observable differences. The goal was to determine if the researcher could predict that students who participated in the workshop would rate the importance of *articulation* higher on the post-survey after the workshop.

Research Question Four – Retention of Knowledge Regarding Articulation

To determine students' knowledge of articulation and its benefits after participation in the piloted workshop the researcher analyzed data collected from informal interviews. Student responses were categorized into student *knowledge of articulation* and student views regarding *benefits of articulation*. The researcher used an informal interview with guided questions. Student responses were not video or audio

recorded. The researcher took detailed notes on individual data collection forms, see Appendix D.

The students' understanding of *articulation* learned through the workshop was of interest to the consortium. The researcher categorized student responses based on whether participants (a) defined the term articulation, (b) identified knowledge learned from workshop (e.g., steps required to articulate a class, benefits of articulation), (c) identified beneficial information learned from workshop (e.g., saving time, money, moving toward post-secondary goals quicker), (d) identified best sources of assistance for information regarding articulation (e.g., workshop, teachers, counselors, Technical College representatives, or articulation coordinator), and (e) identified additional sources of assistance for questions regarding articulation (e.g., counselors, teachers, CTE instructors, Technical College representatives, articulation coordinator).

Whether students viewed articulation as beneficial was also of interest to the consortium. The researcher categorized student responses dealing with *benefits of articulation* based on whether students identified (a) benefits to students in high school (i.e., student worked harder to do well in course so that it would articulate, student was prepared for course at technical college) and (b) benefits of articulating courses to technical college (save money, save time, move toward post-secondary goals quicker).

The goal was to determine if there were observable trends based on student responses recorded from the informal interviews. The researcher combined the qualitative data with the quantitative data to present a richer picture of student knowledge toward articulation.

Summary

This study was based on retrospective data obtained from the West Georgia Technical College's Articulation Survey. The subjects for this study were 3 county school systems located in West Georgia. To be eligible, the school system had to be a member of the West Georgia Tech Prep Consortium. The participants had to be working toward a regular diploma in the tech prep track or a college prep track with a tech prep seal. Qualitative and quantitative data was blended to provide the best picture of what students knew about articulation, thus providing pertinent information to the consortium so a stronger delivery model explaining articulation could be developed that would benefit all transitioning students.

Data from this survey were used in the current investigation to examine student information and attitudes toward articulation. If student attitudes and information base can be changed regarding the importance of articulation of classes to the postsecondary level, then the stakeholders may benefit. The high schools may benefit from students working toward passing a class that will articulate to the postsecondary program. Students and their families may benefit whenever coursework is articulated because money and time may be saved by the student at the postsecondary level institution. The student may benefit by the seamless transition from the high school to the postsecondary institution. Finally, the postsecondary institution may benefit by having better prepared students enter their programs of study.

IV. RESULTS

This study investigated the information base of students in articulated classes and their perception about using *articulation* as they transition from secondary to post-secondary options. Specifically, did students with disabilities demonstrate a significant difference in their knowledge of articulation and its benefits as compared to their peers without disabilities? Additionally, by comparing the pre/post surveys of students who participated in an intervention workshop piloted by the consortium the researcher hoped to determine if knowledge of articulation would increase and perceptions about articulation be improved. In an effort to determine if the workshop had a lasting impact on the students' knowledge base of the benefits of articulation, the researcher collected qualitative data using informal interviews with ten students who had participated in the workshop. This qualitative data contributed to the study by allowing the researcher to identify patterns and themes expressed by the students regarding knowledge and benefits of articulation.

Presented in this chapter are the results of the quantitative data analyses, which include separate discussions of statistical significance of the first three research questions. Analyses were performed using the Statistical Package for the Social Sciences (SPSS) Version 11.5 computer software program (SPSS Inc., 2002). Analyses of the qualitative

data were conducted by the researcher to observe trends and discuss the fourth research question.

Quantitative Data Analysis Results

Research Question 1: Understanding of Articulation

Are there differences between students with and without disabilities in their understanding of how articulation works prior to the articulation workshop?

In order to test the first research question, an analysis of variance was performed with a dependent variable (*understanding of articulation pre-test*) and an independent variable with two levels (*student classification – special education /regular education*). The results of Levene's Test of Equal Variance indicated the assumption of homogeneity of variance was not violated, F (1, 63) = 0.077, p = .782.

The descriptive statistics for the independent variable *classification* were *special education students* (N = 19) and *regular education students* (N = 46). Five articulation questions on the survey that dealt with *understanding of articulation* were combined to obtain a mean score. The mean response for students with disabilities was 3.17, (SD = 0.61) and for regular education students it was 3.07, (SD = 0.56). The analysis of variance compared group means for each *classification* (*special education* and *regular education*).There was not a statistically significant difference between groups, $F($ 1, 63) = .39, p = .53, η^2= .01. The observed power was .10, and the low power was likely a result of small sample size.

Research Question 2: Perceived Importance of Career Tech Programs

Do student demographics impact perceived importance of career technical programs after participating in the articulation workshop?

To test research question two a repeated measures analysis of variance with one within-subject factor (time) and three between-subject factors (gender, classification, grade level) was performed. There were ten questions on the survey. The responses for these questions were combined to create a mean score for the perceived importance of career technical programs (CTE).

Time. There was not a statistically significant change from pre-test to post-test in the construct of perceived importance of CTE programs, $F(1,61) = 1.71$, $p = .20$, $\eta^2 = .03$. The observed power is .25. The mean for the pre-test was 3.55 ($SD = 0.59$) and the post-test was 3.72 ($SD = 0.55$). The workshop was designed to address student perceptions of articulation and was not designed to change the students' perceived importance of CTE programs. Results indicate that perceptions did not change from pre to post-test.

Student demographics. There was not a statistically significant difference in the perception of the importance of CTE by gender, $F(1,61) = 1.55$, $p = .22$, $\eta^2 = .03$. The observed power is .23. There was not a statistically significant difference in the perception of the importance of CTE by grade level, $F(1,61) = 0.49$, $p = .49$, $\eta^2 = .01$. The observed power is .11. There was not a statistically significant difference in the perception of the importance of CTE by student classification, $F(1,61) = 0.06$, $p = .81$, $\eta^2 = .03$. The observed power is .23. Perceptions of CTE were not impacted based on the student's gender, grade level, or classification.

Interaction effects. There was not a statistically significant interaction effect between time and gender, F (1, 61) = 049, p = .49, η^2 = .01. The observed power is .11. The pre-test mean for females was 3.45 (*SD* = 0.49) and for males it was 3.65 (*SD* = 0.69). The post-test mean for females was 3.71 (*SD* = 0.60) and for males it was 3.74 (*SD* = 0.50). There was not a statistically significant interaction effect between time and grade level, F(1,61) = 1.06, p = .31, η^2 = .02. The observed power is .17. The pre-test mean for 9th and 10th graders was 3.50 (*SD* = 0.61) and for 11th and 12th graders it was 3.58 (*SD* = 0.57). The post-test mean for 9th and 10th graders was 3.79 (*SD* = 0.52) and for 11th and 12th graders it was 3.60 (*SD* = 0.60). There was not a statistically significant interaction effect between time and classification, F(1,61) = 0.003, p = .95, η^2 = .00. The observed power is .05. The pre-test mean for special education was 3.67 (*SD* = 0.49) and for regular education it was 3.74 (*SD* = 0.58). The post-test mean for special education was 3.54 (*SD* = 0.54) and for regular education it was 3.55 (*SD* = 0.62).

Research Question 3: Impact of Workshop

Did students' perception of articulation change after participating in the articulation workshop?

To test the third research question a repeated measures analysis of variance with one within-subject factor (time) and one between-subject factor (classification) was performed.

Time. There was a statistically significant change in the perception of articulation from pretest to posttest with an F (1, 63) = 53.91; p< .001; η^2 = .46. The eta square indicated a large effect size. An inspection of means by *time* revealed that post-survey had significantly higher scores of *perception of articulation* (*M* = 3.83 *SD* = 0.57) than

did pre-survey mean scores (M = 3.10, SD = 0.57). The results indicate that students' perception of articulation increased as a result of the workshop.

Classification. There was not a statistically significant difference between the students classified as special education or regular education with an F (1, 63) = 0.99; p= .33; η^2 = .02. The observed power is .17 an indication that there is a 83% chance of making a type II error, this may be a result of the small sample size. The observed means for both groups indicate similar perceptions of articulation.

Interaction effect. There was not a statistically significant interaction effect between time and classification with an F (1, 63) = .01; p = .93; η^2 = .00. The observed power is .05 an indication that there is a 95% chance of making a type II error, this may be a result of the small sample size. The observed changes from pre-test to post-test indicate similar increases in student perception of articulation. The means and standard deviations are represented in table 11 for perception of articulation for time by group.

Table 11

Perception of Articulation: Means and Standard Deviations for Time by Group

	Pre-Test				Post-Test			
	Special Ed		Regular Ed		Special Ed		Regular Ed	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Perception of Articulation	3.17	0.61	3.07	0.56	3.92	0.46	3.80	0.60

Research Question 4: Impact of Articulation Workshop

What did participants in the articulation workshop know about articulation one year after the workshop?

Ten students, five from each *classification* (*regular education* and *special education*) were selected randomly by the researcher to participate in a follow-up interview. A thematic analysis revealed the following themes from student interviews (a) recognition of the term articulation and explanation of its meaning, (b) details related to how articulation works, (c) identification of sources for additional help, and (d) identification of courses that would articulate. All students interviewed remembered participating in the articulation workshop the previous year.

Recognition of the term articulation and explanation of its meaning. Students with disabilities recognized the word, *articulation*, but could not readily define the term. Four of the students with disabilities (80%) reiterated that the workshop last year was about articulation, but could not explain or clarify what was learned by participating in the workshop. Four of the regular education students (80%) recognized the word articulation and defined it as earning credit for a course at both the high school and technical college. The regular education students (100%) stated that participating in the workshop changed their understanding of articulation, none of the students with disabilities credited the workshop for changing their understanding of articulation.

How articulation works. Requirements needed to articulate a class could not be identified by any of the students with disabilities. Four of the regular education students (80%) remembered that the course at the high school had to be passed before credit was earned at the technical college. Four of the regular education students (80%) also

identified the benefits of not having to repeat the course and mentioned articulation would save time as they transitioned to the technical college. One of the regular education students (20%) mentioned that articulation would save money on future educational cost.

Sources for additional help. When asked to identify sources of help for additional questions regarding articulation, two students with disabilities (40%) focused on the teacher who participated in the study. Two students with disabilities (40%) stated they would ask a counselor for additional information. Four regular education students (80%) identified several individuals as sources of help (i.e., teachers, counselors, CTE teachers and representatives of West Georgia Technical College).

Courses that would articulate. When asked to identify articulation courses students with disabilities (100%) identified only the math class from the study. No additional courses that could articulate were identified by students with disabilities. The regular education students (100%) identified the math class and other classes that could articulate. Career technical classes and dual enrollment classes were identified as classes that could articulate by regular education students (60%).

Common trends. When asked about the benefits of participating in the workshop, 8 of the 10 students interviewed (80%) encouraged the continuation of the workshop in an effort to increase student knowledge regarding articulation. Nine of the 10 students interviewed (90%) stated that articulation was beneficial.

Summary

Analysis of the data revealed interesting results of the first research question - Are there differences between students with and without disabilities in their understanding of how articulation works? Based upon this study, there was no statistically significant differences in the *perceptions of articulation* between the *special education* or the *regular education* students who participated in the pre-survey. Further, students with and without disabilities reported having limited knowledge of articulation.

The second research question was do student demographics impact perceived importance of career technical programs? No statistically significance differences were observed between *gender*, *grade level*, and *classification* as they related to student's perception of the *benefits of CTE programs*. Students with and without disabilities did not perceive career technical programs as important in the transition from high school to post-secondary options.

The third research question was did students' perception of articulation change after participating in the articulation workshop? Analysis of data revealed statistical significance for *time*, *measure* and the interaction of *time * measure*. Regular education and special education students who participated in the articulation workshop responded favorably to the post-survey questions regarding the benefits of *articulation* and the benefits of participation in *CTE programs*. The results suggest that the articulation workshop improved student knowledge of articulation and the benefits of CTE programs.

The fourth research question was did participants in the articulation workshop retain the knowledge provided by the workshop. A thematic analysis of data from the informal interviews revealed that special education students had difficulty defining

articulation and identifying the benefits of articulation. Students with disabilities recognized fewer sources of assistance for articulation. Overall, special education students identified less information regarding articulation and experienced difficulty generalizing knowledge of articulation that would benefit transition to post-secondary options.

Regular education students were able to define and identify the benefits of articulation. Regular education students verbalized the benefits of articulation on future goals. Regular education students identified and generalized more information regarding articulation and its benefits to post-secondary options.

V. DISCUSSION, CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS

The purpose of this study was to investigate student perception and knowledge of articulation and student perceptions of the benefits of career technical classes. Additionally, the study compared the pre/post surveys of students who participated in a piloted articulation workshop to determine if participation in the workshop changed the perceptions students had toward articulation.

This study involved 200 students who attended high schools that are members of the West Georgia Tech Prep Consortium. Retrospective data from the West Georgia Tech Prep Consortium Articulation Survey were used to measure *knowledge of articulation* and *benefits of career technical classes* to establish a baseline for data comparison. Sixty-five students selected from the baseline group participated in an intervention workshop. Post-survey data were used to measure changes in *knowledge of articulation* and *benefits of career technical classes.* The independent variables included in this study were *gender, classification* (regular education and special education), and *grade level* (9^{th}/10^{th} grade and 11^{th}/12^{th} grade). In this chapter, discussion regarding statistically significant results, conclusions, limitations and recommendations for further research are presented.

Discussion of Findings

In the previous chapter, results obtained by testing the research questions were presented for this study. The research questions examined whether there was a statistically significant difference in the *knowledge of articulation* and *benefits of career technical classes* of students by *classification* (special education and regular education), *grade level* (9^{th} and 10^{th} grade, 11^{th} and 12^{th} grade), and *gender* (male and female).

Retrospective data from the West Georgia Tech Prep Consortium's Articulation Survey were analyzed for the first three research questions. The statistical methods of Univariate Analysis of Variance and the General Linear Model were used to analyze the quantitative data for the first three research questions. The fourth research question was based on qualitative data. The trends and implications of these trends will be discussed. The remainder of this discussion section focuses on the findings for each of the research questions. Analyses were performed using the Statistical Package for the Social Sciences (SPSS) Version 11.5, 2002.

Data Analysis Results

Understanding of Articulation

The results of this study related to student *knowledge of articulation* revealed that there was not a significant difference between students with disabilities (N = 19) and their peers without disabilities (N = 46) in their knowledge of articulation. Mean scores were reflective of the Likert scale used for the survey, [1] *strongly disagree* to [5] *strongly agree*. The mean response of the survey questions dealing with the construct *understanding of articulation* for students with disabilities was 3.16, (*SD* = .611) and for

regular education students it was 3.06, (*SD* = .562). A difference of group means, allowed the researcher to determine that the differences did not occur by chance. However, if group means do not differ significantly, as in this study, then it is inferred that the independent variable does not have an effect on the dependent variable. As well, the means for both groups indicated that students were undecided about their knowledge of articulation. By selecting the position represented by "3" on the Likert scale students were neither positive nor negative about knowledge regarding articulation.

Research has indicated that utilization of articulation is beneficial to all students (Harvey, 2001; Naylor, 1987; Proctor & McElvey, 2001). However, unless students are knowledgeable of what articulation is and its benefits they are less likely to utilize available programs offered by the school which they attend. The alignment of articulated programs between secondary and post-secondary institutions has focused on the development of strong lines of communications between instructors, administrators and coordinators, but has not focused on developing strong lines of communications with students (Hawkins, 2001; Just & Adams, 1997; Pucel & Sundre, 1999; Rojewski, 2002). A breakdown in the delivery of information to the critical stakeholder, the student, may be why students have limited knowledge regarding articulation and its benefits to transition, thus resulting in the underutilization of articulation.

Benefits of Career Technical Classes after Participating in the Articulation Workshop

Research indicates that participation in CTE classes has an important impact on students. Students who participate in CTE programs become life-long learners, develop skills that transfer to post secondary options and are less likely to drop-out of school (Harvey, 2001; Naylor, 1987; Proctor & McElvey, 2001). Additionally, research suggests

that participation in CTE programs has a positive impact on future employment options (D'Amico, 1991; Plant, 2001; Rojewski, 2002; Wagner et al., 1993).

In this study it appeared that students did not perceive the importance of their participation in CTE courses on future plans. Although student responses to questions regarding the *career technical classes* indicated they enjoyed and valued the classes, responses linking this training to post-secondary options was not positive. Only 33 (16.5%) respondents agreed that the CTE classes aligned with their future goals and educational plans. There was no significant difference between students with disabilities and their peers in their perceptions of the importance of career technical education. The results further revealed that there was no significant difference by gender or grade levels. Students low ratings of the importance of CTE classes may be a result of an unfocused approach to taking CTE classes (Stone et al., 2004), which results in enrollment in non-occupationally specific CTE classes. There is a substantial body of evidence that shows significant, positive economic benefits resulting from pursuing a CTE concentration in high school which could articulate to post-secondary options (Stone et al., 2004).

Impact of Workshop on Articulation

Completing the workshop on articulation appeared to be beneficial for students with regard to increasing student perception of articulation. Comparison of quantitative scores on the pre/post surveys reflected significant increases in both factors *knowledge of articulation*. The mean response on the pre-survey for the construct *articulation* was 3.10, (SD = 0.58); following the workshop a mean response was 3. 83, (SD = 0.57). This increase was statistically significant (F (1, 64) = 53.91; $p < .001$; $\eta^2 = .46$) and the eta square indicated a large effect size.

The increase in mean responses to the construct *articulation* would suggest that the workshop was effective in increasing student knowledge and perceptions of articulation. This was the desired outcome of the consortium. That is, the consortia believed an increase in student knowledge of articulation was the first step in increasing student use of articulation.

Follow-up of Knowledge Regarding Articulation

Results of the follow-up interviews revealed interesting trends within the classification of students (*regular education* and *special education*), but not within gender or grade placement. The first trend related to students and the provision of information about articulation. Although the consortium thought students were knowledgeable of articulation that was not indicated in the baseline data collected from the pre-survey. Obtaining knowledge is essential to learning and the workshop provided the forum for students to be exposed to pertinent information regarding articulation and its benefits. Results of the follow-up interview indicated students believed they benefited from participation in the workshop; 100% of the students recommended that the workshop continue to be used as a format for sharing information regarding articulation. However upon closer review, the qualitative data suggested that students with disabilities remembered less information regarding *articulation* and *career technical classes* than their peers without disabilities. Although 80% of the students with disabilities stated that the workshop was about articulation, they could not define or explain what articulation was. Of their peers without disabilities 80% not only defined articulation but identified benefits articulation would have on transitioning to post-secondary training.

The second trend related to the application of information provided in the workshop. It is important that students become strategic learners and apply knowledge acquired to new situations (Horowitz, 2007; Sturomski, 2007). Data from the follow-up interviews indicated that students with disabilities had difficulty applying knowledge of articulation to new situations. When asked what courses would articulate, none of the students with disabilities identified any class other than math that would articulate. Students without disabilities identified a wide range of classes that would articulate to post-secondary programs (i.e., academic classes, CTE classes, dual enrollment classes). This is not surprising given that many studies indicate that students with disabilities experience difficulties retrieving information from memory, retaining or applying information, and experience difficulty communicating details either verbally or in writing (Horowitz, 2007). The students with disabilities demonstrated difficulty transferring or generalizing learned information.

Conclusions

Currently, high school programs are trying to find ways to successfully transition students to post school education and training. This study dealt with one strategy, articulation. Retrospective data from the West Georgia Tech Prep Consortium Articulation Survey and follow-up interviews examined the issue of articulation in relation to student *knowledge of articulation* and *perception of CTE programs*.

First, from the data obtained it appears that both students with and without disabilities have limited knowledge of articulation and that there is not a significant difference between the groups in their perceptions of articulation. Limited knowledge of

articulation and its benefits could be related to the underutilization of articulation of courses from the secondary to post-secondary institutions.

Second, in general students did not perceive participation in career technical classes as beneficial to their future post-secondary options. Further, the perception of the benefits of participation in CTE classes was similar for students with and without disabilities, males and female, and students in $9^{th}/10^{th}$ grade and 11^{th} and 12^{th} grade. This may be a possible explanation for the low rates of articulation of classes to the technical college, less than 1% of incoming freshmen at WGTC articulate classes. Limited perception of the benefits of participation in career technical classes to future post-secondary options could be related to the lack of utilization of articulation.

Results indicated that statistically significant differences existed in the knowledge of articulation of students after participating in the workshop. Overall, students experienced an increased knowledge of articulation after participating in the intervention workshop. These results would indicate that the workshop was effective.

Finally, the unique learning characteristics of students with disabilities as revealed in the qualitative data from follow-up interviews (e.g., poor memory and recall, difficulty generalizing information) need to be considered in the transition process. Students with disabilities recalled less knowledge of articulation than their peers and were less likely to generalize knowledge obtained from the workshop. This would suggest that students with disabilities might need more direction with regard to accessing the benefits of articulation as they transition to post-secondary programs.

This study's findings on the low levels of understanding of articulation and its benefits and processes and the low perception of CTE and its benefits on future plans

could have an important impact on transition planning for students with disabilities. The good news is that students' knowledge of articulation can be changed relatively easily. This study showed that by participating in a workshop that identified the process of articulation student knowledge was increased. An assumption then (which needs to be researched – see future research) is that increase of knowledge of perception of articulation results in an increase use of articulation as students transition from high school into post secondary options.

Limitations

Several limitations of the study provide an important framework for interpreting the results. The first is generalizability. The students who participated in the piloted workshop and post-survey were representative of the high schools of the West Georgia Tech Prep Consortium, which composed the population of students who participated in the baseline survey. The population was drawn from high schools within the west Georgia area that are classified as rural by the Georgia State Department of Education. This condition limits the ability to generalize from this sample to a larger non rural population.

The survey used in this study is based on self-report measures. Self ratings of knowledge are not based on a performance measure of knowledge itself. These measures depend on the participant's ability and willingness to accurately and honestly respond to questions. Therefore, some possibility exists that the participants' reporting was not an accurate reflection of knowledge regarding articulation and the benefits of career technical education.

This study categorized students as either special education or regular education. Thus, the results can be used by others investigating students based on these broad classifications. The comparisons of students by existing categories: Learning Disabilities, Behavior Disturbances, or Mental Retardation was not possible because all students with disabilities were desegregated for the purpose of this study. However, research indicates that there are differences in student outcomes, engagement, achievement, etc. by disability category (Deshler & Schumaker, 2001; Sitlington & Frank, 1994; Wagner & Blackorby, 2005; Wagner et al., 2005). Therefore, additional research would have to address the comparison of students by existing categories.

Although the study's experimental group was selected from the larger population of students who had taken the pre-survey utilized to establish the baseline, they were all assigned to geometry, a class which is eligible to articulate to the technical college. This condition limits the ability to generalize from this sample to other classes that would articulate to the technical college. Students participating in CTE classes might perceive a stronger relationship between articulation of the CTE classes to future training programs at the post-secondary technical college.

Recommendations

Recommendations for future research are presented in this section. The first recommendation is to further investigate the student knowledge of articulation and student perceptions of the benefits of career technical classes within other school systems. The investigation would consider additional demographic variables (e.g., socio economic status or race) or other external factors (e.g., teacher involvement, engagement

in CTE student organizations, or program of study) as they relate to the knowledge of articulation and the benefits of participation in CTE programs.

New laws continue to focus on preparation and transition of students with disabilities to life beyond high school. IDEA 2004 emphasized the importance of transition goals based upon age-appropriate training, education and employment. Perkins III addressed the needs of students with disabilities in CTE programs, emphasizing that CTE programs prepare students, including special populations, for subsequent employment in high-skill, high-wage occupations, or participation in postsecondary education [*Section 114(c)(3)(B)(v)(III)]*. The No Child Left Behind Act impacts education as it emphasizes the importance of student achievement, implementation of research driven programs, and data-based evaluations. Although it is important to focus on academic achievement, this might actually decrease the emphasis on CTE programs which offer many benefits to students, the workplace and society. IDEA, NCLB, and Perkins III should work together to shape the educational opportunities for youth with disabilities. Future research is recommended to provide supporting data of the effectiveness of articulation as it applies to the laws outlined above.

Finally, one goal of the consortium was to increase the use of articulation. Additional research is recommended to determine whether an increase in the number of students who articulate courses increases. Future data analysis of students who have completed the workshop provided by the consortia and transitioned to the technical college might reveal interesting trends to further explore student utilization of articulation.

Summary

The effectiveness and impact of a seamless transition from secondary schools to post secondary educational opportunities has received national attention since research has documented that students with disabilities lag behind their peers when compared on school (graduation rates) and post school (post secondary attendance, and employment rates) achievement indicators (Blackorby & Wagner, 1996).Transitioning from high school to higher education is difficult for all students, but especially challenging for students with disabilities (Madaus, 2005). The purpose of this study was to examine a strategy — articulation — utilized by the technical colleges in the state of Georgia to promote the transition of students from secondary education to post-secondary education.

Students with and without disabilities need to acquire the knowledge, skills, and strategies that would assist their transition into post-secondary options. Understanding articulation and its benefits provides students a powerful tool that supports the transition from high school to post-secondary options as they become strategic, effective, and lifelong learners. This study contributed to the understanding of student knowledge of articulation and its benefits.

Evidence from this study suggests the importance of providing information regarding articulation and its benefits to students with and without disabilities. The workshop provided a short, easy to use synopsis of articulation and its benefits to students as they move toward graduation and consider post-secondary options. Student recommendations based on the qualitative data from the study indicated that continual reinforcement and reiteration of articulation and its benefits would be advantageous to students. The difficulty of retaining and transferring knowledge which students with

disabilities experience can be easily addressed by reinforcement of articulation information through workshops, guidance counseling, and instructors of articulated classes. Increasing the knowledge of articulation provides additional tools for students with and without disabilities to use when making a smooth transition from high school to postsecondary education.

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APPENDICES

APPENDIX A

STUDENT CAREER TECHNICAL EDUCATION SURVEY

http://www.elisten.com/web30/surveys/4C3DB4C17F8548A7AB8847CF512A5872

Student Career Technical Education Survey

Student Identification Number

Date

School

Place a check by all activities in which you have been involved:

- ☐ Vocational Evaluation/Assessment
- ☐ On-Campus Work Experience
- ☐ Community Service or Volunteer Work
- ☐ Job Shadowing
- ☐ Paid Community-Based Work Experience
- ☐ School to Work Program
- ☐ Apprentice Program
- ☐ Guidance Counseling
- ☐ Regular Academic Classes
- ☐ Special Education Courses
- ☐ Dual-Enrollment
- ☐ Career Technical Clubs
- ☐ Paid Employment

Other

Next > Save

Powered by eListen DIGITAL SURVEY SOFTWARE

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
I feel the career technical program is preparing me to get a job?	☐	☐	☐	☐	☐
I feel that my high school coursework is relevant to my future goals?	☐	☐	☐	☐	☐
I feel the career guidance at my high school regarding postsecondary options has been adequate to meet my needs?	☐	☐	☐	☐	☐
I feel the career technical program is preparing me for future employment options in the community?	☐	☐	☐	☐	☐
I feel the career technical program is preparing me for post-secondary education opportunities?	☐	☐	☐	☐	☐
I feel the training in the career technical program matches my abilities and interests?	☐	☐	☐	☐	☐
I feel that I have an active role in planning for my future?	☐	☐	☐	☐	☐
My teachers communicate with me regularly about the activities related to the career technical classes.	☐	☐	☐	☐	☐
I feel the amount of time I spend in career technical training is adequate.	☐	☐	☐	☐	☐
I feel participating in training at career technical training sites has been beneficial to my educational experience.	☐	☐	☐	☐	☐
career technical classes are ate for my career interest and	☐	☐	☐	☐	☐
I understand what my career training options are upon graduation from high school.	☐	☐	☐	☐	☐

I feel good about the career technical training activities in which I have been involved.	☐	☐	☐	☐	☐
I am familiar with articulation of career technical classes to courses offered at the Career Technical College.	☐	☐	☐	☐	☐
I discuss the articulation process with my teachers.	☐	☐	☐	☐	☐
I understand how articulation works.	☐	☐	☐	☐	☐
I think I will benefit from articulation of high school classes to courses offered at the Career Technical College.	☐	☐	☐	☐	☐
I think I will not benefit from articulation of high school classes to courses offered at the Career Technical College.	☐	☐	☐	☐	☐
I think the articulation of courses between the High School and the Career Technical College is beneficial to my future goals.	☐	☐	☐	☐	☐

What changes would you like to see in your present course of study?

What information would you like to have regarding articulation?

What courses do you intend to articulate?

What program of study do you intend to pursue at the Career Technical College?

What is your future employment goal?

APPENDIX B

PROGRAM ARTICULATION BROCHURE

What classes articulate?

- *Accounting*
- *Allied Health/ Healthcare Science*
- *Automotive*
- *Business and Office Technology*
- *Early Childhood Care and Education*
- *Drafting/ Engineering & Design*
- *Marketing*
- *Mathematics*

A student passing these classes with at least an 85 average have the opportunity to exempt these course at the technical college level.

West Georgia Technical College

Empowering students to achieve their highest potential for a productive future.
http://www.westga.tec.ga.us/

Columbus Technical College

Where your tomorrows are created today, preparing students for employment.
.http://www.columbustech.org/

Southern Union State College

Building confidence and academic skills.
http://www.suscc.cc.al.us/

Articulation

Troup County High School

Troup County Comprehensive High School
1920 Hamilton Road
LaGrange, GA 30240

Phone: 706/812-7957
Fax: 706/812-7904
Email: www.troup.k12.ga.us

ARTICULATION

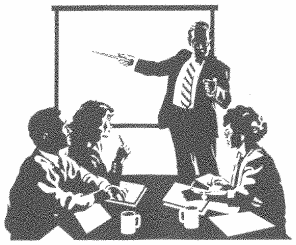
Troup County High School

LAUNCH INTO YOUR FUTURE

Troup County High School
1920 Hamilton Road

Articulation

Articulation arrangements may reduce duplication of learning, increase the effectiveness and efficiency of learning, improve program content and standards, allow for fuller use of existing program facilities and equipment, provide a more attractive option for students and thereby supporting high school completion, and enable postsecondary institutions to obtain larger enrollments and better prepared students.



Working together for a productive future.

WHAT IS ARTICULATION?

Articulation is when students at the high school level may receive college-level credit for courses taken in high school under the articulation agreement with a Technical College.

Moving into the Future

- Students earning 85% or higher in selected courses have the opportunity to exempt matching courses at the technical college.

- Articulation allows high school students to progress through postsecondary training quicker, resulting in less duplication of skills mastered and economic savings for higher education.

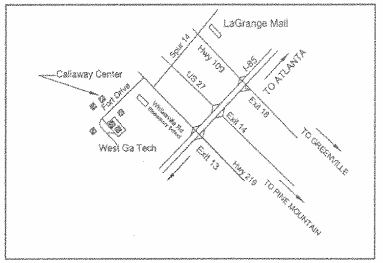
CAN ARTICULATION HELP ME?

- By articulating classes a student may be able to save money spent toward college expenses by shortening the total number of classes needed for a program of study.

- Articulation can reduce duplication of classes and skills learned while at the high school level.

WHO CAN HELP ME?

- My counselor at high school.
- My Career/Technical teachers.
- My school's articulation coordinator.



Location of West Georgia Technical College

Troup County High School

Questions? Contact:: Jane Robinson
812-7957 ex 455

Troup County Comprehensive High School
1920 Hamilton Road
LaGrange, GA 30240

Phone: 706/812-7957
Fax: 706/812-7904
Email: www.troup.k12.ga.us

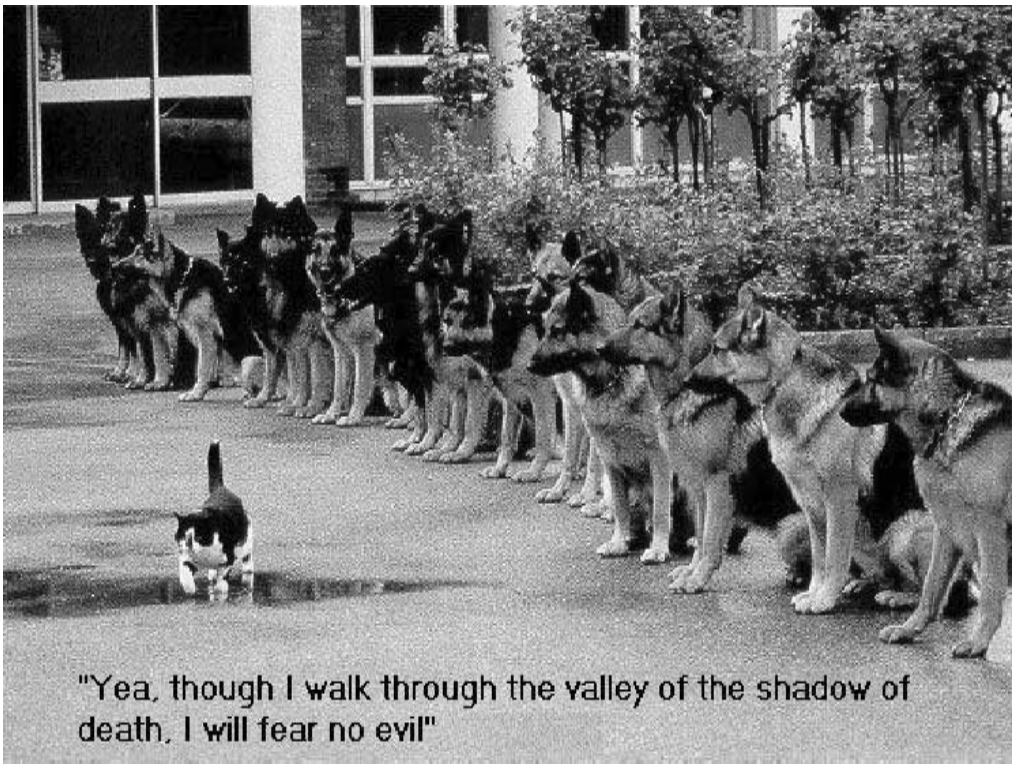
APPENDIX C

POWER POINT VISUAL PRESENTATION

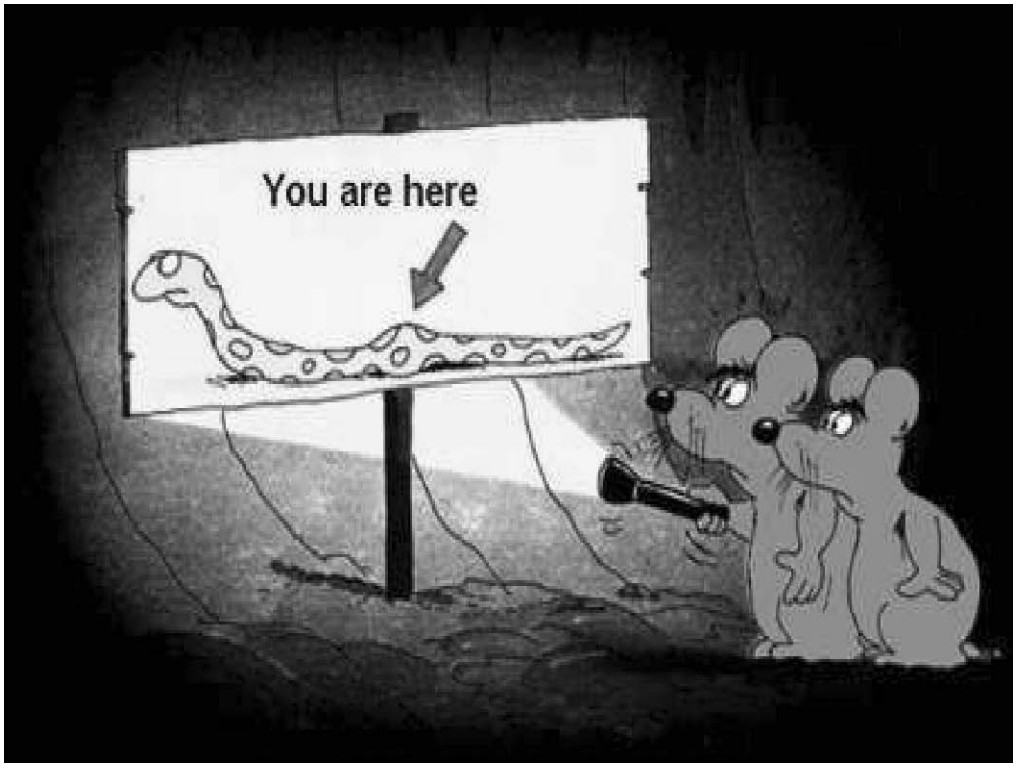
Life After High School

The Education Continuum

Emphasize life long learning. Graduation from High School is only the beginning.



Graduating, entering the adult work can be frightening!



It’s not unusual to feel lost and in the dark about what you will do after high school. As participants of CTE classes you are in a much better place than many students!

Ability to Secure Qualified Applicants
(By Size)

	Number of Employees				
	10 or Less	11-50	51-500	Over 500	State Average
Very Hard to Find	13.2	17.2	10.2	5.3	10.8
Hard to Find	37.7	39.7	49.0	31.6	40.0
Not Too Hard to Find	24.5	27.6	26.5	52.6	33.4
Easy to Find	5.7	6.9	10.2	5.3	5.2.
Not Hiring	18.9	8.6	4.1	5.3	10.5

DOL/ETA: 2003 **Percent of Responses**

When employers were asked to respond to a Department of Labor survey dealing with finding qualified applicants, you can see from the chart that for many companies it was Hard to Find qualified employees. These employers were looking for employees with: good work ethics, technical skills, and the ability to work as a team member. These are skills you are learning while in your CTE classes.

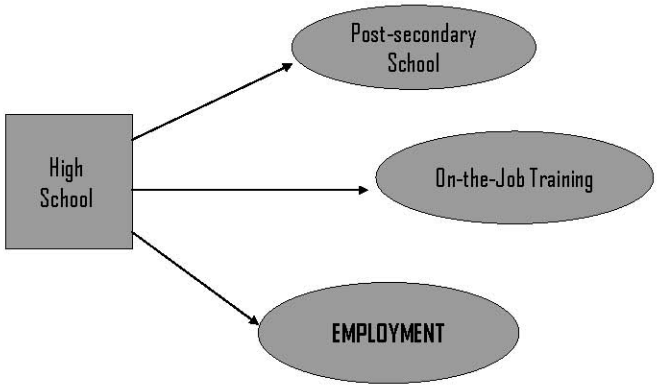
Ability to Secure Qualified Applicants (By Industry Category)

	Prof, Tech, Finance, Ins, Real Estate	Retail, Wholesale, Trade	Manuf	Health Social Care
Very Hard to Find	4.0	16.0	8.7	17.4
Hard to Find	38.0	56.0	65.2	30.4
Not Too Hard to Find	32.0	20.0	17.4	34.8
Easy to Find	6.0	8.0	4.3	8.7
Not Hiring	20.0	0.0	4.3	8.7

DOL/ETA: 2003

As you can see all of the employers, across the board from Prof, Tech, Finance, Ins, Real Estate to Health Social Care stated it was Hard to secure qualified applicants. What does this mean? If you are qualified and have the skills then your employment future looks very promising. How do you get qualified? You're doing that now, by taking CTE classes here at the high school, but you will need to do more. That's what we will be talking about today.

Launch
(Life After High School)



Today we are going to talk about Life After High School. What do you need to know and knowing these things will help you!

Career Technical Education

- Value-Added
- Connects classroom learning with hands on applications
- Reinforces positive work ethics and employability skills

Many of you are already participating in CTE classes. Did you know: discuss the 3 bullets.

Career and Technical Education

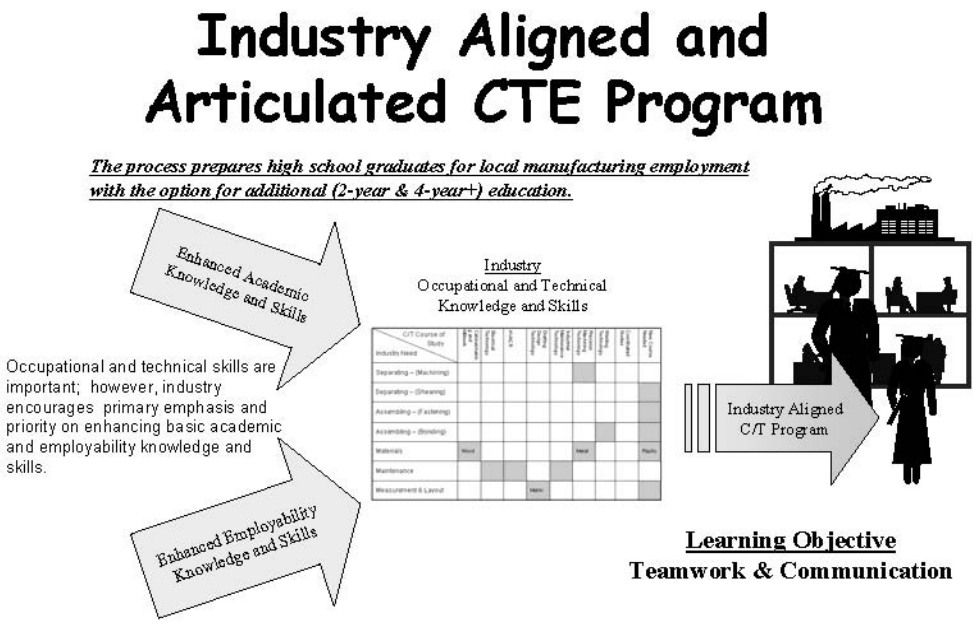
- Career/Technical Education is a **rigorous**, **progressive**, and **vital** part of the total educational system
- providing students with **life skills**
- preparing them as a **workforce** in which business and industry is confident.

Plus, CTE programs are challenging.

Mission of CTE

To provide resources and services that enable student success in life and work.

CTE is different from the “old” shop classes of the past. If you’re up to the challenge of working in a high tech world then CTE is the place for you.

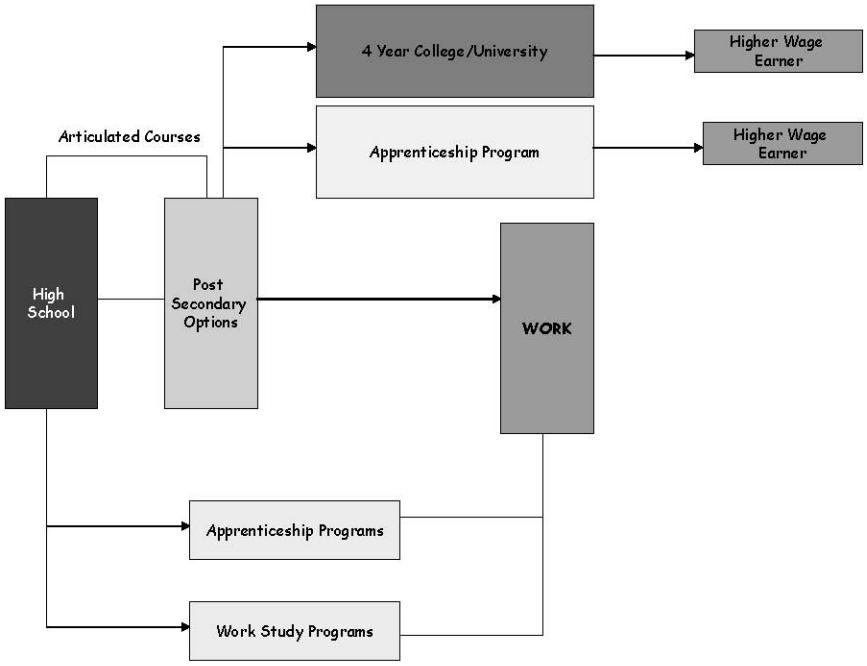


The skills you learn in CTE classes are wanted and needed by industry. Articulation of many CTE classes will help you move toward your goals in life QUICKER.

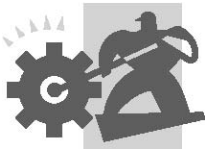
Postsecondary Transition

- Articulate from your high school to:
  - West Georgia Technical College
  - Columbus Technical College
  - Southern Union State Community College

Where can you articulate classes? To any post-secondary technical college within the state of Georgia. Plus, Southern Union State Community College in Alabama because of it's close proximity to Georgia recognizes some classes that would articulate to our technical colleges.

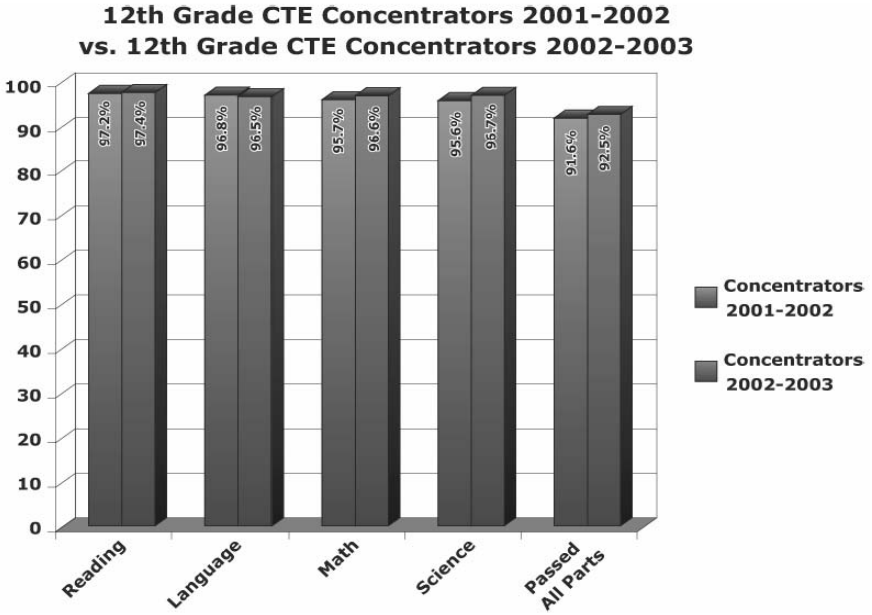


Remember, there are many ways to benefit from CTE programs and to reach your post-graduation goal. Explain how CTE programs allow you gain working experience through the apprenticeship programs or work study programs– which can lead directly to work opportunities without additional college training. Articulation of courses can shorten your time at a post secondary facility and may lead you directly to a 4 year college or an apprenticeship program --- either of these paths will result in higher wages for you in future jobs.



Why should students be encouraged to participate?

Because it works!



CTE classes develop not only work related skills, but allows students to apply the theory learned in core academic classes to hands on applications. The result is that CTE concentrators do better in the graduation tests administered by states.

What classes will articulate?

- These high school classes are aligned with courses at the Technical College:
  - Accounting
  - Allied Health/Healthcare Science
  - Automotive
  - Business and Office Technology
  - Early Childhood Care and Education
  - Drafting/Engineering and Design
  - Marketing
  - Mathematics

Review the classes that will articulate. Allow students to ask questions.

What do I have to do?

- Pass the class with an average of 85% or better
- Take a test given by WGTC and pass with an 80% or better
- Tell the technical college they attend that they have courses from high school that articulate

The student must meet certain requirements in order to articulate a class. Review the items on this slide.

How does articulation help me?

Reduces duplication of classes
Helps a student earn their degree quicker
Saves money

What's the cost?

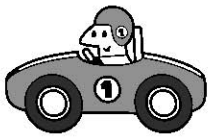
There isn't one… articulation is a **WIN – WIN** situation!

Students win by reaching their goals quicker

Parents win because money spent on paying for duplicated courses can be used for other needs

Who can help?

- My counselor
- My CTE instructors
- The articulation coordinator at my high school



Remind the students that there are many people to help them, but they must be their own advocate.

Questions?

Please get a brochure before you leave.

If you think of questions later, don't hesitate to contact your high school counselor or teacher.

Remind the students that if they have questions late and their teacher or counselor can't answer their question the articulation coordinator will be glad to help.

APPENDIX D

FOLLOW-UP INTERVIEW DATA COLLECTION FORM

Follow-Up Interview Data Collection Form

To be completed by researcher:				
Male_____	Female _____	Reg Ed _____	Sp Ed _____	Grade _____

Workshop Effects

1. How did participating in the workshop change your understanding of articulation?

2. Tell me what you learned about articulation from the workshop?

3. What information provided by the workshop about articulation was most beneficial?

4. Since the workshop, what has been your best source of information about the courses that might articulate?

5. If you had additional questions, who would you ask for help regarding articulation requirements?

Articulation Benefits

1. How do you think knowing about articulation might benefit students at the high school levels?

2. How would articulation of courses to the technical college benefit students?

3. Would you recommend that other students participate in the workshop? Why or why not?

APPENDIX E

PERMISSIONS FOR USE

From: "Jane Robinson" <janerobinson2@charter.net>
To: "'James R. Stone III'" <stone003@umn.edu>
Date: 11/5/2005 12:21 PM
Subject: RE: Permission to use tables

CC: <robinj9@auburn.edu>
Dr. Stone,

Thank you very much for allowing me to include your tables in my dissertation. Let me assure you that appropriate citations will be utilized to acknowledge your work. Thank you again.

Jane S. Robinson

-----Original Message-----
From: James R. Stone III [mailto:stone003@umn.edu]
Sent: Saturday, November 05, 2005 10:42 AM
To: 'Jane Robinson'
Subject: RE: Permission to use tables

You have my permission. Please provide appropriate citation.

jrs

James R. Stone III

Director

National Research Center for Career and Technical Education

University of Minnesota

1954 Buford Avenue

Saint Paul, MN 55108

Office (612) 624-1795

Mobile (612) 396-7640

From: Jane Robinson [mailto:janerobinson2@charter.net]
Sent: Saturday, November 05, 2005 8:45 AM
To: stone003@umn.edu
Cc: robinj9@auburn.edu
Subject: Permission to use tables

Dr. Stone,

Currently, I am a doctoral student at Auburn University working on my research. I found your article, Career and Technical Education in the Late 1990s: A Descriptive Study very interesting and would like to have your permission to include two tables from this study in my dissertation. My dissertation is researching the attitudes of students with special needs regarding articulation and its impact on their post-secondary options. Including information from your study would be very beneficial. The two tables that I would like to use are:

* Percentage of U.S. High Schools Offerings of Specific CTE Programs, 2000, found on page 206

* Percentage of U.S. High Schools Reporting of CTE Enrollment Change between the 1995-1996 and the 1999-2000 School Years by School Type, found on page 216

The article is in the Journal of Vocational Education Research, 29 (3), 2004.

I look forward to hearing from you. If you have any questions, please let me know. Thank you again.

Jane S. Robinson
Doctorial Student
Rehab and Special Education
Auburn University
Auburn, Alabama
robinj9@auburn.edu

From: "Jane Robinson" <janerobinson2@charter.net>
To: <robinj9@auburn.edu>
Date: 11/6/2005 7:13 PM
Subject: FW: Permission to use diagram

-----Original Message-----
From: Jay Rojewski [mailto:rojewski@uga.edu]
Sent: Saturday, November 05, 2005 11:49 AM
To: Jane Robinson
Subject: Re: Permission to use diagram

Dear Jane. Certainly! You have my permission to use the diagram in any manner appropriate for your study. I am really glad that the article is useful and wish you the best of luck in completing your research. If I can be of help in the future, do not hesitate to contact me.

Best wishes,
Jay

---- Original message ----
>Date: Sat, 5 Nov 2005 10:33:10 -0500
>From: "Jane Robinson" <janerobinson2@charter.net>
>Subject: Permission to use diagram
>To: <rojewski@uga.edu>
>Cc: <robinj9@auburn.edu>
>
> Dr. Rojewski,
>
> I am a doctorial student at Auburn University in the
> department of Rehab/Special Education and currently
> I am working on my dissertation. I would like to
> have permission to include a diagram from your
> article Preparing the workforce of tomorrow: A
> conceptual framework for career and technical
> education found in the Journal of Vocational
> Education Research, 27 (1), p 7-35. The diagram is a
> representation of the conceptual framework for
> career and technical education.
>
> I found your article very beneficial to my research
> and I would be honored if you would allow me to
> include your diagram in my dissertation. If you have
> any questions regarding how the diagram will be
> utilized, please let me know. I appreciate your
> consideration of my request and look forward to
> hearing from you.
>
> Thank you,
>
> Jane S. Robinson
> Doctorial Student
> Rehab/Special Education
> Auburn University
> Auburn, Alabama
> robinj9@auburn.edu
>
>
Jay W. Rojewski, Professor
University of Georgia
210 River's Crossing
Athens, GA 30602

(W)706.542.4461 (FAX) 706.542.4054

From: "Jane Robinson" <janerobinson2@charter.net>
To: "'Wehmeyer, Michael L'" <wehmeyer@ku.edu>
Date: 11/5/2005 12:21 PM
Subject: RE: Permission to use diagram

CC: <robinj9@auburn.edu>
Thank you so much. Actually, Dr. Dunn is my major professor and I will be sure to pass along your greetings. I do appreciate your willingness to allow me to include your work in my dissertation. Thank you again.

Jane S. Robinson

-----Original Message-----
From: Wehmeyer, Michael L [mailto:wehmeyer@ku.edu]
Sent: Saturday, November 05, 2005 11:30 AM
To: Jane Robinson
Subject: RE: Permission to use diagram

Jane, that's fine with me. The book is now out of print and Brookes returned copyright ownership to each chapter's author, so you do not need permission from anyone other than me to use the figure, and I am fine with it's use.

Good luck with your dissertation, say hi to Drs. Rabren, Browning, and Dunn for me...

Mike

-----Original Message-----
From: Jane Robinson [mailto:janerobinson2@charter.net]
Sent: Saturday, November 05, 2005 10:22 AM
To: Wehmeyer, Michael L
Cc: robinj9@auburn.edu
Subject: Permission to use diagram

Dr. Wehmeyer,

I am a doctorial student working on my dissertation at Auburn University. I have read a lot of your work on self determination. I have found your work to be very informative for my own research. I would like to have your permission to include the diagram "Facilitative conditions for promoting the self-determination of adolescents" in my dissertation. This diagram is found on page 263 in Self-determination across the life span: Independence and choice for people with disabilities.

I would be honored if you would allow me to include this diagram in my dissertation. If you have any questions, please feel free to contact me. I look forward to hearing from you.

Jane S. Robinson
Doctoral Student, Rehab/Special Education
Auburn University
Auburn, Alabama
robinj9@auburn.edu