THE IMPACT OF CREDIT-BASED TRANSITION PROGRAMS ON CHANGING THE EDUCATIONAL ASPIRATIONS OF HIGH SCHOOL SENIORS

BY

WENDY LOU HOWERTER

DISSERTATION

Submitted in partial fulfillment of the requirements for the degree of Doctor of Education in Educational Organization and Leadership in the Graduate College of the University of Illinois at Urbana-Champaign, 2011

Urbana, Illinois

Doctoral Committee:

Professor Debra Bragg, Chair
Professor Jane Loeb
Associate Professor Steven Aragon
Assistant Professor Lorenzo Baber
Abstract

This correlational study samples twelfth grade (senior) students in one central Midwest high school and examines their participation in credit-based transition programs and their changes in educational aspirations. Surveys and community college data are used to collect quantitative data to address six research questions. Using Hossler and Gallagher’s (1987) College Choice Model and Hossler and Stage’s (1992) focus on the predisposition phase, the researcher studied the impact of participation in credit-based transition programs during the senior year in high school. Controlling for initial senior-year aspirations and participation in dual credit during the junior-year in high school along with other variables known to influence educational aspirations, final senior-year aspirations were compared for students participating in academic dual credit and CTE dual credit, and non-participants. Descriptive analysis of student characteristics by type of dual credit participation and non-participation is presented. Multiple linear regression including interaction effects for gender and race/ethnicity with participation in senior-year dual credit (academic dual credit or CTE dual credit) was used to determine if aspirations could be changed during the senior year while controlling for student characteristics, significant others’ influence, and extracurricular activates. Results showed female students and non-white students benefit most from participating in senior-year CTE dual credit. Parents’ education was a significant variable in the model. Interaction terms for income status with participation in senior-year dual credit were not significant variables in the model. Results provide insights into the relationship of student participation in credit-based transition courses and student educational aspirations which is important to policy makers, education professionals, parents, and students.
I want to dedicate my education and research to the memory of my father, Ubert C. Allen, Jr., who did not have the opportunity for postsecondary education but who believed that education was a gift that could never be taken away, and to my mother, Maureen E. Schwengel, who had the opportunity for vocational training and who believes hard work and persistence is the real meaning of satisfaction.
Acknowledgments

I would like to thank my husband, Don and my daughters, Kari and Lauren for their support and understanding as I completed all of my graduate education. My graduate education has spanned nearly two decades and school definitely took over a large percentage of my personal time as I managed to continue working at the same time. I tried to balance everything with the least amount of consequences.

I would like to thank my dissertation committee, Dr. Bragg, Dr. Loeb, Dr. Aragon, and Dr. Baber. Dr. Bragg, I appreciate your patience throughout my course work and your recommendations throughout the dissertation process. Dr. Loeb, I appreciate all of your time helping me work through the statistics and giving me direction.

I would like to thank my friend and boss, Dr. Eileen Tepatti who was a source of support in many ways. As a friend and mentor, you provided the necessary encouragement to keep me progressing to the end. I appreciate you and respect you.

I would also like to thank our cohort who provided support and understanding to each other throughout the course work, qualifying exams, and dissertation process. I am sure we will remain friends forever.

I want to thank God for the personal strength, patience, and the means to accomplish my goals, and I pray I will use these gifts in a manner God has planned for me.
Table of Contents

Chapter 1 Introduction ............................................................................................................. 1
  Research Problem .................................................................................................................. 1
  Educational Pipeline ............................................................................................................. 2
  Transition Pathways ............................................................................................................. 3
  Purpose of the Study ............................................................................................................. 7
  Research Questions .............................................................................................................. 8
  Significance of the Study ..................................................................................................... 9
  Definition of Terms ............................................................................................................. 10
  Limitations and Delimitations ............................................................................................. 12

Chapter 2 Review of the Literature ........................................................................................ 14
  Theoretical Foundations of Aspirations .............................................................................. 14
  Educational Aspirations ....................................................................................................... 22
  College Choice and Aspirations ........................................................................................... 28
  Aspirations and Predisposition ............................................................................................ 30
  Aspirations and Student Characteristics .............................................................................. 31
  Aspirations and Significant Others ..................................................................................... 43
  Aspirations and Extracurricular Activities ......................................................................... 54
  Credit-based Transition Programs ...................................................................................... 58
  Characteristics of Students in Credit-based Transition Programs .................................... 72
  Summary ............................................................................................................................... 79

Chapter 3 Methods .................................................................................................................. 81
  Research Design ................................................................................................................... 81
  Population and Sample ........................................................................................................ 82
  Instrumentation .................................................................................................................... 88
  Data Collection .................................................................................................................... 91
  Variables ............................................................................................................................... 96
  Methods for Analyzing ........................................................................................................ 116
  Research Question One ....................................................................................................... 118
  Research Questions Two, Three, Four, Five, and Six ......................................................... 121

Chapter 4 Findings .................................................................................................................. 123
  Descriptive Analysis ............................................................................................................ 123
  Research Question One ....................................................................................................... 124
  Research Question Two ....................................................................................................... 143
  Research Questions Three, Four, Five, and Six ................................................................. 146

Chapter 5 Summary, Conclusions, Implications, and Recommendations .......................... 155
  Summary of the Study ........................................................................................................ 155
  Major Findings and Discussion ............................................................................................ 157
  Conclusions and Implications ............................................................................................ 166
  Recommendations .............................................................................................................. 174
References .............................................................................................................................. 178

Appendix A Dual Credit Course Details ........................................................................ 194

Appendix B Variables, Survey Questions, and Sources ................................................. 196

Appendix C Parent/Guardian Refusal Letter .................................................................. 198

Appendix D Student Information Letter .......................................................................... 199

Appendix E Parent Informational Newsletter .................................................................. 200

Appendix F Instrument #1 .............................................................................................. 202

Appendix G Student Consent .......................................................................................... 206

Appendix H Instructions for Instrument #1 .................................................................... 208

Appendix I Revised Student Consent ............................................................................. 210

Appendix J Instrument #2 .............................................................................................. 212

Appendix K Instructions for Instrument #2 .................................................................... 217

Appendix L Crosstabulation of Senior Academic Dual Credit Hours & Senior CTE Dual Credit Hours ........................................................................................................... 219

Author’s Biography ........................................................................................................ 220
Chapter 1

Introduction

The social and personal benefits of obtaining a higher education degree include greater financial stability through employment, better health, higher levels of education for one’s children, and an enhanced likelihood to contribute to society (Desrochers, 2006). Researchers have examined the college decision-making process and identified variables that influence students’ aspirations to continue their postsecondary education after high school. These variables include academic, economic, social, family, and demographic factors (see, for example, Hossler & Gallagher, 1987). These factors have been shown to contribute to students’ educational aspirations, but are there also educational programs that contribute to students’ aspirations to attend college? That is, to what extent is participation in certain high school-level programs related to educational aspirations? Do various educational opportunities offered in high schools relate to students’ aspirations for college?

Research Problem

In the midst of overwhelming evidence of the benefits of college attendance and enormous social pressure to attend college, it is puzzling that high school students would decide not to attend college, and yet college continues to be a long shot rather than a foregone conclusion for many youth. Researchers have studied why students fail to attend college from various perspectives, i.e., economic (Mortenson, 2000), social (Karabel & Astin, 1975), and academic (Kolstad, 1979), and many observe that the presence of educational aspirations is an important first step in the decision-making process to attend college (Choy, Horn, Nuñez, & Chen, 2000; Hanson, 1994; Hossler & Gallagher, 1987; Hossler, Schmit, & Vesper, 1999).
Indeed, pre-college experiences are important in the development of college aspirations and their chances for a college degree. Kuh, Kinzie, Buckley, Bridges, and Hayek (2007) note,

WHO STUDENTS ARE AND WHAT THEY DO before starting their postsecondary education make a difference in their chances for obtaining a baccalaureate degree or another postsecondary credential. ... the variables of interest include gender, race and ethnicity, academic preparation, educational aspirations, socioeconomic status (SES), motivation to learn, and the college choice process ... (p. 21)

**Educational Pipeline**

The route from early childhood through postsecondary education can be conceived as an educational pipeline (Ewell, Jones, & Kelly, 2003). Unfortunately, the educational pipeline has a variety of leaks with the most consistent leak impacting low-income, minority youth (The Forum for Youth Investment, September/October 2004). According to Ewell et al., for every 100 students entering ninth grade, only 67 students graduate from high school within four years and of these 67 students only 38 continue on to postsecondary education. According to the National Center for Education Statistics (NCES), in 1972 the rate of enrollment in postsecondary education immediately following high school graduation was 49%. The rate increased to 67% by 1997 and has since fluctuated between 62% and 69% (Planty et al., 2008).

Choy, Horn, Nuñez, and Chen (2000) synthesized the findings from several studies (Horn, 1997; Horn & Chen, 1998; Horn & Nuñez, 2000) to develop a five-step educational pipeline and analyze at-risk students’ progress through the pipeline. Choy et al. (2000) noted the first two steps of the pipeline include aspirations for higher education and being academically prepared for college. It is important to note that these two steps represent the largest loss of students from the educational pipeline (Horn, 1997). Choy et al. (2000) recommended that efforts to increase college access might have the largest payoff when targeted toward
encouraging students to aspire to a college degree and helping them prepare academically to improve their chances of successfully navigating the system.

Plany et al. (2008) reported enrollment trends across all educational levels and tracked indicators that contribute to enrollment fluctuations including race/ethnicity, socioeconomic status (SES), gender, parents’ education, organizational contexts, and student and family characteristics. Many of these same attributes are identified as factors that contribute to the development of students’ educational aspirations (Hossler & Gallagher, 1987; Hossler, Schmit, & Vesper, 1999; Hossler & Stage, 1992).

According to Hossler and Gallagher’s (1987) model of college choice, student characteristics (race/ethnicity, academic ability, gender), significant others’ influence (parents’ education, SES, parents’ expectations, peer influence), and extracurricular activities (athletics, student government, yearbook, and others) relate to students’ educational aspirations. Many of these factors are ascribed, some socioeconomic, and others are determined early in the students’ educational career (Hearn, 1984). In fact, students begin to formalize educational aspirations during the ninth or tenth grades (Hossler & Stage, 1987) suggesting interventions occurring early in students’ high school careers may be able to influence their educational aspirations. But, what about students who do not decide to attend college until later in high school? Do students in grades 11 and 12 have opportunities to consider college participation, and how influential are high school interventions for these students?

Transition Pathways

Transition pathways are programs developed to “provide many of the important elements that have been missing from high school for most students: challenge, engagement, access to the
adult world, and support” (Lerner & Brand, 2006, p. vii). The key foci of transition programs are “increasing academic performance, closing the achievement gap, and increasing entry to and retention in postsecondary education, particularly for first-generation, low-income, or students of color and students with disabilities” (Lerner & Brand, 2006, p. vii). Transition pathways are implemented to reduce the gap between those who are likely to attend college and those who are not likely to attend college.

Lerner and Brand (2006) reviewed various transition pathways studies and found that students participating in transition programs showed higher educational aspirations than non-participants. These programs include Diploma Plus, College Now, Tech Prep, and Early College Program. Each of these programs uses dual enrollment as a strategy to encourage students to continue their formal education. The Diploma Plus program helps out-of-school youth to reconnect to formal education. The College Now program prepares students for the rigors of postsecondary education, Tech Prep is a planned, articulated sequence of study integrating technical and academic education and targeting the middle majority, and the Early College Program uses dual enrollment as a motivator for low to mid-range students.

To assist students from high school to college, credit-based transition programs have been growing over the past decade. As a means of providing pathways for more students to transition to college, credit-based transition programs have expanded offerings to include students with varying academic abilities (Hughes, Karp, Fermin, & Bailey, 2005). Student pathways to college can be defined as steps or trigger points down the path to college attendance (Hu, 2003). These steps include educational aspiration formation, academic preparation, and actual enrollment in college (Hu, 2003). Pathways that bridge directly into higher education allow students to take credit-bearing college courses during their junior and senior years, while
creating linkages for those students who are off track to graduation or are returning after dropping out (Steinberg & Almeida, 2007).

To address concerns about the lack of consensus on definitions associated with various credit-based transition initiatives including dual enrollment and dual credit, Kim, Barnett, and Bragg (2003) used an expert panel and a Delphi method to define dual credit, dual enrollment, and articulated credit. The Delphi method is based on a “structured process for collecting and distilling knowledge from a group of experts by means of a series of questionnaires interspersed with controlled opinion feedback” (Ziglio, 1996, p. 3). As a result of their work, Kim, Barnett, and Bragg provided the following definitions to the state of Illinois:

Dual credit: “Students receive both high school and college credit for a college-level class successfully completed.”

Dual enrollment: “Students are concurrently enrolled (and taking college level classes) in high school and college” but they are not getting college credit for the same course(s).

Articulated credit: “Articulated credit programs align secondary and postsecondary courses in order to allow students who successfully complete selected high school courses to become eligible to apply for credit in the corresponding college course in the future.” (p. iii)

The primary focus of this study is on dual credit, referring to student enrollment in a course that awards high school and college credit simultaneously.

Some of the expected benefits of dual credit include (a) providing opportunities for underrepresented young people to move into and through postsecondary education, (b) helping postsecondary institutions improve both transition to college and retention rates, and (c) helping high school faculty understand the skills and knowledge students need to be successful in college (Vargas, 2007). Student outcomes associated with successful transition include a whole host of benefits, including enhanced learning, course completion, credit accumulation, and eventually degree completion.
Kuh et al. (2007) provided a broad, holistic definition of student success with three indicators: (a) pre-college experiences, (b) a combination of student behaviors and institutional conditions during college that lead to student engagement, and (c) post-college outcomes measured by grades, graduation, student learning gains, employment, and graduate school attendance. A predictor of student success that is important to this study is the pre-college experience, which is defined by the effects of family background, academic preparation, aptitude and college readiness, motivation to learn, family and peer support, and enrollment choices. These enrollment choices, including participation in credit-based transition programs, can be measured along with the variables identified in the Hossler and Gallagher (1987) model. The research on student characteristics and the impact of significant others on the educational aspirations of students is abundant, and there is a moderate amount of research on extracurricular activities, but few studies have examined the impact of transition programs on educational aspirations. Researchers and policy analysts (for example, Western Interstate Commission for Higher Education, 2006; Bragg, Loeb, Gong, Deng, Yoo, & Hill 2002; Lekes, Bragg, Loeb, Oleksiw, Marszalek, Brooks-LaRaviere, et al. 2007) have studied secondary education programs like Tech Prep, Advanced Placement, International Baccalaureate, and dual credit, but research on how these curricular programs relate to students’ educational aspirations is limited. This study attempts to fill this gap in the literature. Evidence of growing enrollments in dual credit is mounting and useful to framing this study.

Waits, Setzer, and Lewis (2005) showed more than 1,160,000 public high school students were enrolled in dual credit courses in 2003, and over 71% of all public high schools offered their students the opportunity for dual credit. Participation in dual credit appears to continue to
grow and understanding who participates and how participation relates to educational aspirations is important to understanding college attendance and completion.

**Purpose of the Study**

The purpose of this study is to determine the impact of credit-based transition programs on changing the educational aspirations of high school seniors. Using Hossler and Gallagher’s (1987) College Choice Model and focusing on Hossler and Stage’s (1992) research on the predisposition phase of college choice, the relationship of credit-based transition programs and educational aspirations is studied. Credit-based transition programs include a number of different programs but this study focuses on dual credit initiatives. Dual credit initiatives are offered through two tracks, academic courses and career and technical education courses. Academic courses include math, science, English, and foreign language (Planty, Provasnik, & Daniel, 2007). Career and technical education (CTE) courses prepare students for a wide range of careers (Association for Career and Technical Education, n.d.). Tech Prep programs offer dual credit to students through articulation agreements developed in consultation with business, industry, labor unions, and institutions of higher education (Office of Vocational and Adult Education, n.d.).

Hossler and Stage’s (1992) predisposition model defines three factors that influence educational aspirations: student characteristics (gender, race/ethnicity, SES, academic ability), significant others’ influence (parents’ expectations, parents’ education, peer influences), and extracurricular activities. Extracurricular activities are traditionally defined to include student clubs, athletics, honor societies, music activities, yearbook, service clubs, government, and vocational clubs. In this research study, credit-based transition programs, also known as dual credit initiatives, are studied to determine their relationship to educational aspirations.
Hossler and Stage (1992) reported numerous variables influencing students' aspirations for college, including academic, demographic, SES, extracurricular activities, and significant others’ influences. This study proposes to examine the relationship of students’ participation in dual credit initiatives to the change in educational aspirations, after controlling for the other variables.

**Research Questions**

1. Are there any differences in student characteristics, significant others’ influence, extracurricular activities, and student’s aspirations among dual credit participation groups (any dual credit participation, academic dual credit participation, CTE dual credit participation, non-participation)?

2. Is there a change in educational aspirations associated with participation in academic or career and technical education (CTE) dual credit in the senior year of high school after controlling for initial educational aspirations, junior-year dual credit hours, student characteristics, significant others’ influence, and extracurricular activities?

3. Is there a difference between males and females in how participation in senior-year dual credit influences student’s final senior-year aspirations while controlling for initial educational aspirations, junior-year dual credit hours, race/ethnicity, GPA, significant others’ influence, and extracurricular activities?

4. Is there a difference between whites and non-whites in how participation in senior-year dual credit influences student’s final senior-year aspirations while controlling for initial educational aspirations, junior-year dual credit hours, gender, GPA, significant others’ influence, and extracurricular activities?

5. Is there a difference between whites and non-whites that depends on gender in how participation in senior-year dual credit influences student’s final senior-year aspirations while controlling for initial education aspirations, junior-year dual credit hours, GPA, significant others’ influence, and extracurricular activities?

6. Is there a difference between low income students and others in how participation in senior-year dual credit influences student’s final senior-year aspirations while controlling for initial educational aspirations, junior-year dual credit hours, student characteristics, parents’ education, parents’ expectations, peer influence, and extracurricular activities?
Significance of the Study

First, this study expands the knowledge surrounding the relationship of participation in credit-based transition programs and a change in educational aspirations while controlling for student characteristics, significant others’ influence, junior-year dual credit completed, and extracurricular activities. Secondly, this study examines the interaction effects of participation in credit-based transition programs with gender, race/ethnicity, and income status on the change in educational aspirations.

Credit-based transition programs intend to provide smoother transitions to postsecondary education and are touted to challenge students by preparing students for rigorous college course work and raising students’ expectations in order to encourage and prepare them for their continued education (Bailey & Karp, 2003). Hossler and Stage (1992) identified extracurricular activities as an element that influences educational aspirations. Are other educational opportunities important to student aspirations? Answering this question for policy makers and educators can influence monetary and program decisions at the state and national levels. And, understanding the relationship of program participation and student aspirations should be of interest to many including parents, students, faculty, counselors, researchers, and policy makers.

If a relationship exists between credit-based programs and educational aspirations, more high schools may want to offer these programs to increase students’ aspirations late in high school, a time when many students’ aspirations may have purportedly stabilized (Hossler et al., 1999). Understanding the differences between academic and CTE dual credit may provide continued support for funding and provide an opportunity for more high school students to get a jump start on their college education. The continued development of credit-based transition programs may improve inter-institutional linkages by bringing continuity and transition to a
disjointed P-16 (pre-school to baccalaureate) system (Venezia, Kirst, & Antonio, 2003). If CTE dual credit is as strong or more strongly related to changes in students’ educational aspirations as academic dual credit, a comprehensive dual credit program that includes academic and CTE dual credit may be viewed more favorably by educators.

**Definition of Terms**

Clarity in explaining the purpose and problems addressed in this study requires defining terminology. A common problem in all types of research is defining terms and ensuring the reader understands the intent of the terms used. To ensure consistency, the definitions of some variables are established for this study.

**Academic dual credit courses.** Academic dual credit courses are defined as dual credit courses with an academic focus. These courses are defined by Central Midwest Community College Board by the assignment of a Program Classification System (PCS) code equal to 1.1 (Central Midwest Community College Board, 2010a).

**Academic performance.** Academic performance is defined as the average grade earned from ninth to twelfth grade in four main core subjects including math, science, English, and social sciences as reported by the student.

**Articulated credit programs.** Articulated credit programs align secondary and postsecondary courses in order to allow students who successfully complete selected high school courses to become eligible to apply for credit in the corresponding college course in the future (Kim et al., 2003, p. iii).

**Career and Technical Education (CTE) dual credit courses.** CTE dual credit courses are defined as dual credit courses with a career and technical education focus. These courses are defined by Central Midwest Community College Board by the assignment of a Program Classification System (PCS) code equal to 1.2 (Central Midwest Community College Board, 2010a).

**Change in educational aspirations.** Change in educational aspirations is defined by measuring the students’ educational goals at the end of the senior year while controlling for their aspirations measured at the beginning of the senior year.

**Credit-based transition programs.** Credit-based transition programs include dual credit programs, academic credit, CTE credit, or both types of credit.
**Dual credit.** Dual credit is defined by the student receiving both high school and college credit for a college level course successfully completed (Kim et al., 2003).

**Dual credit programs.** Dual credit programs are defined as programs that allow high school students to enroll in college courses and earn college and high school credits simultaneously, thereby exposing them to the academic and social demands of postsecondary education (Karp, Bailey, Hughes, & Fermin, 2004 p. 1).

**Dual enrollment.** Dual enrollment is defined as concurrent enrollment (and taking college level classes) in both high school and college (Kim et al., 2003).

**Educational aspirations.** Educational aspirations are defined as the post-high school educational goal the respondent would like to achieve were there no constraints on his or her financial or intellectual resources (Berman & Haug, 1975; Rehberg, 1967).

**Extracurricular activities.** Extracurricular activities are intramural sports, interscholastic sports, music, theater, student government, academic honor societies, yearbook, service clubs, academic clubs, vocational clubs, military groups, and hobby clubs.

**Parents’ education.** Parents’ education is defined by the parent (either father or mother) who has attained the higher level of education.

**Parents’ expectations.** Parents’ expectations are defined by the highest level of education the student thinks his parents want him/her to achieve.

**Participation in credit-based transition programs.** Participation in credit-based transition programs is defined as enrollment and completion of courses in dual credit programs resulting in the accumulation of college credit hours, either academic or CTE.

**Peer influence.** Peer influence is defined by the number of friends (none, few, some, most, all) planning to attend college (2 year or 4 year).

**Postsecondary education.** Postsecondary education refers to formal education post high school (or grade 12) level. This term is used interchangeably with higher education and college.

**Significant others’ influence.** Significant others’ influence is a group of variables including parents’ expectations, parents’ education, socioeconomic status (SES), and peer influence.

**Socioeconomic status.** Socioeconomic status is defined by the sum of the yearly income of each major wage earner in the household defined by the median salary based on occupation and regional area of employment provided by the State Department of Employment Security. This measure represents a value defined at a single point in time not necessarily representative of the entire data collection period. The term household income is used synonymously.
Student characteristics. Student characteristics are a group of variables including gender, race/ethnicity, and academic performance.

Tech Prep. Tech prep is a program defined through the Carl D. Perkins Career and Technical Education Improvement Act of 2006 (Public Law 109-270) focusing on articulation and coordination between secondary and postsecondary educational courses with both academic and technical components.

Limitations and Delimitations

This study is set in a single high school to ensure consistency in the policies and procedures associated with the dual credit program. The limitation of using one high school is that results may not be representative of the larger student population that attends other high schools in the state. Using one community college district provides consistency in policies and procedures but may limit course offerings according to district demands and resource availability. Therefore results are representative of a single high school in a single community college district. An effort was made to select a high school that is typical of other high schools in the state in terms of its size, demography, academic and CTE curriculum, and funding.

All high school seniors were invited to participate in the study, therefore the sampling procedure was self-selection to participate or not. Random sampling was not feasible, given the potentially modest number of students who participate in the credit-based transition programs. All participants completed a voluntary consent form that allowed them to complete two surveys and provided this researcher with access to community college credit hour data. The generalizeability of results was further limited by students opting out of the study. Nearly 20% of the senior class did not continue throughout the academic year. Fifty-seven participants were removed prior to the implementation of the second survey as a result of leaving the high school during the academic year.
Another limitation is the lack of follow-up with the students to confirm the importance of their educational aspirations through their activities immediately following graduation from high school, including work, college enrollment, military assignment, or a combination of the activities. Not knowing whether students attend college limits the meaningfulness of results as knowing students’ aspirations without knowing behavior provides only partial understanding of the college decision-making process.
Chapter 2

Review of the Literature

The review of literature includes several different fields of study. Database searches included the fields of education, social sciences, and psychology. Specific databases included EBSCO, ERIC, Education Full Text, Questia, CSA Sociological Abstracts, PsychINFO, and digital dissertations. Keywords included aspirations, dual credit, Tech Prep, dual enrollment, career and technical education, college decision making, college transitions, and postsecondary education.

The review of literature begins with the theoretical foundations of aspirations including social stratification and status attainment. The chapter continues with a discussion of educational aspirations, college choice and aspirations, the relationship between aspirations and predisposition, student characteristics, significant others, extracurricular activities, and credit-based transition programs. The chapter also provides a description of students who participate in credit-based transition programs and outcomes associated with participation. The literature review is reflective of the social climate of its time. As the research progresses over time there is evidence of changing patterns in the population attending and completing a college education.

Theoretical Foundations of Aspirations

The evolution of the college choice models began decades ago with research on status attainment. A brief background on the foundations of educational attainment and the development of various models associated with it is provided in this section.

Social stratification. Social stratification theory has been used to study many different aspects of life including fertility, life styles, attitudes and personality, life opportunities, and
mobility (Pfautz, 1953). In an early review of the literature on social stratification Pfautz noted that early studies were descriptive and focused on social inequalities as opposed to rectifying or changing social status. Social stratification continues to be conceptualized differently through various lenses. Some scholars (e.g., Gordon, 1951; McGuire, 1950) saw social stratification as a system of ordering or differentiation. This system of ordering or ranking was used as a system of inclusion and exclusion. Kaufman (1952) defined social stratification as a system of inequalities, and Gordon (1951) spoke of the hierarchical arrangement of persons representing a system of higher and lower, or superior and inferior.

Pfautz (1953) noted, in an effort to operationally define social stratification, researchers looked at social class and status as functions of stratification. But defining social class and/or social status has been problematic because the various classifications used by researchers have been inconsistent in their operational definition (e.g., scales, indices, single and multiple criteria). Goldschmidt (1950) identified occupational and social classes, Pfautz and Duncan (1950) identified power and status classes, and Gordon (1951) distinguished four classes by social, political, economic, and occupational criteria. Having a consistent definition of social status and understanding its relationship to society as a whole is important to defining stratification and social rights. Social status and education have been closely linked for over five decades, according to Marshall (1950, 2006). As Marshall (2006) noted, the social elements of citizenship range from:

The right to a modicum of economic welfare and security to the right to share to the full in the social heritage and to live the life of a socialized being according to the standards prevailing in the society. The institutions most closely connected with it are the educational system and the social services. . . (p. 30)
The early works of Max Weber and Pitirim Sorokin contributed greatly to the foundational development and growth of sociological theory. Both men and their life experiences contributed to the social, political, and economic thought of their day. Max Weber’s early interest was in developing a methodology for social science. Weber’s emphasis was not on the current economic focus of the day but on the role of religious values, ideologies, and charismatic characteristics of leaders in shaping societies (Lagasse, 2009). Weber’s primary focus was on establishing a methodological basis for objective and valid causal explanations in the social and cultural fields (Parsons, 1965).

Weber defined social stratification by several dimensions including class, status, and power by which class was a non-social entity, and status and party emerged through socialization (Gane, 2005). Weber suggested that the class situation developed within the economic order indicating that various levels of property identified the basic categories of class situations (Cox, 1950). Status groups were defined within the realm of social order or distribution of honor. Cox suggested that Weber’s definition of class and status were generally abstract and were limited by its non-dynamic approach in non-market societies.

Weber’s sociology focused on three types of power which include economic, political, and spiritual (Turner, 1993). His interest in the detail of distinguishing political and economic structures and processes set him apart from Marxist theorists. Weber considered religious power the most important area of relations between society and cultural systems (Parsons, 1965). According to Parsons, Weber’s desire was to demonstrate both the comparative and a theoretical analysis of his assertions which frequently resulted in ambitious but unfinished work. But Parsons noted, “Weber built the intellectual heritage of humanistic historical scholarship into the
canons of an analytical and empirical social science at a far higher level than anyone before him” (p. 175).

From the experiences of Pitirim Sorokin and the time he devoted to the writings of sociology, nearly 55 years, one can imagine the scope of study that has evolved and that has ultimately guided sociological study throughout the years. Throughout his years of study, Sorokin has focused some of his study on the important aspects of social change. As Zimmerman (1973) noted,

He added to the science of sociology...as indicated throughout his work, is his emphasis upon change, the 4th dimension of social as well as physical sciences, and his formulation of empirical rules and principles delineating social changes from their causes and results. (p. 69)

Social mobility is an important factor in social change. Sorokin’s study of social mobility identified mobility in terms of space, both geographic and social space. Social space of a person is defined by his/her relation to another person (Sorokin, 1959). The complexity of this definition may not be immediately recognized by the simplicity of the words expressed. To elaborate on this complexity, Sorokin noted,

In order to know a man's social position, his family status, the state of which he is a citizen, his nationality, his religious group, his occupational group, his political party, his economic status, his race, and so on must be known. Only when a man is located in all these respects is his social position definitely located. (p. 5)

Social mobility is a selective process due to the fact that barriers must be overcome in order to experience movement from one class to another (Zimmerman, 1973). Within each class is a system of stratifications. Sorokin (1959) defined social stratification as follows,

Social stratification means the differentiation of a given population into hierarchically superposed classes. It is manifested in the existence of upper and lower social layers. Its basis and very essence consist in an unequal distribution of rights and privileges, duties and responsibilities, social values and privations, social power and influences among the members of a society. (p. 11)
Considering stratification exists in many facets of society including economic, political, occupational, racial, ethnic, gender, age, family, and religious it is important to recognize three facets are closely intercorrelated. These intercorrelated factors include economic, political, and occupational (Sorokin, 1959, 1962).

_Blauf and Duncan_. Blau and Duncan’s (1967) work focused on a basic demographic model of intergenerational mobility. Many studies on social mobility focused on occupational attainment (Rehberg, 1967; Reissman, 1953; Sewell, Haller, & Straus, 1957). But as Blau and Duncan (1967), Sewell, Haller and Strauss (1957), and Rehberg (1967) pointed out, the allocation of social position was becoming increasingly dependent on higher education, with the highly valued occupations being restricted to those whose educational attainments had gone beyond secondary school. As Kerckhoff (1976) notes,

The basic Duncan model uses SES of origin and ability to explain educational attainment, and then all three of those variables are used to explain occupational attainment. The most fundamental finding from that analysis is that occupational attainment is most fully influenced by, educational attainment, and the great preponderance of the effects of SES and ability on occupational attainment are mediated through educational attainment. (p. 368)

The basic Duncan model of social stratification placed education at the center of mobility concerns (Hout, 2007). In an effort to give theoretical meaning to the basic findings of Duncan and to explain the associations between SES and ability, and educational attainment, social-psychological variables (i.e., significant others’ influence and ambition) were added to the model. The movement from basic models of social stratification to status attainment by adding intervening explanatory variables (significant others’ influence and ambition) between origin and destination became known as the Wisconsin model (Hout, 2007).

_Status attainment models_. Status attainment models attempt to explain “social mobility patterns by identifying those attributes which seem to facilitate the movement of individuals into
desirable occupations” (G. Marshall, 1998, p. 640). As noted by Sewell et al. (1957), many early studies were not based on adequate samples from large populations and lacked control variables known to be related to status and aspirations, which led to weak support for results. Others in the field had already begun to consider the psychological aspects of educational and occupational attainment (Anderson, Brown, & Bowman, 1952; Rosen, 1956). Anderson, Brown, and Bowman (1952) and Sewell, Haller, and Straus (1957) focused on social mobility and the relationship of intelligence to occupations and mobility.

Sewell, Haller, and Straus (1957) studied 4,167 randomly selected male and female high school seniors from Wisconsin (excluding farm families). The data were a one-sixth random sample from a state wide data set collected in 1947-48 by the Wisconsin Student Counseling Center. This dataset included non-farm seniors from all private and public high schools in Wisconsin. While controlling for intelligence, the researchers studied social status (defined by prestige of parental occupation) and its relationship to educational and occupational aspirations by gender. They found a relationship between social status and educational aspirations in both males and females using Chi-square analysis. Males and females from high status families were more likely to have high level educational aspirations than are those from lower status families.

Rosen (1956) noted the possibility of psychological and cultural factors affecting social mobility by influencing the individual’s willingness to develop and exploit his own talent, intelligence, and opportunities. He studied social mobility in terms of achievement motivation and value orientation. These variables are defined as psycho-cultural dimensions of social stratification. Rosen related achievement motivation and value orientation to behaviors (high school grade attainment and educational aspirations) that may affect social mobility. Rosen studied the relationship of achievement motivation to high school grade attainment and the
relationship of value orientation to educational aspirations. The study involved a random sample of 120 white male high school sophomore students from two large public high schools in Connecticut grouped by social strata. Social strata were defined by the following three characteristics of the major wage earner: (a) occupation, (b) education, and (c) ecological area of residence. These values were combined and sorted into five clusters (social strata) ranging from high status to low status. Using Chi-square analysis, Rosen showed significant relationships between achievement motivation and grades, and between value orientation and education aspirations.

The study of social mobility and educational and occupational attainment has evolved over more than 40 years of research. Blau and Duncan (1967) developed a recursive model of occupational attainment that has been cited widely in the literature. This national study was one of the first of its kind in scope (size). The 20,700 respondents represented approximately 45 million men aged 20 to 64 in the United States in March 1962. The model began with two independent variables, father’s educational and occupational attainment, progressed to son’s educational attainment, son’s first occupational attainment (son’s first job), and son’s current job. A common criticism of this model was the focus on the social aspects of attainment (father’s occupation and education) without regard for the psychological aspects of attainment (intelligence, aspiration). The educational and occupational attainment outcomes were primarily related to social factors, such as the family’s position within the social structure. Blau and Duncan’s basic model of stratification had the following variable relationships. Father’s education and occupation were two separate starting points to the model that showed a bidirectional relationship between the two variables. Father’s education was related to son’s education. The son’s education was related to his first job and his occupation in 1962. The
father’s occupation was related to the son’s education, the son’s first job, and the son’s occupation in 1962.

Sewell and Shah (1967) looked at the impact of social psychological factors including SES and intelligence on college plans, attendance, and graduation. They studied a randomly selected cohort of high school seniors from Wisconsin during a seven year time frame after graduation, spanning from 1957-1964. The initial data were obtained from a questionnaire survey of all Wisconsin high school seniors in public, private, and parochial high schools in 1957. The follow up study was completed on one-third (9,007 participants responded) of the original sample during 1964-65. Both SES and intelligence had a significant positive impact on college planning, attendance, and graduation and considerable indirect effects on the level of educational attainment through the variable college planning when studying the variables using path analysis. Blau and Duncan (1967) developed the first model of status attainment but would subsequently be criticized due to several limitations. Sewell, Haller, and Portes (1969) questioned the model defining the relationships between variables used in the study, including the failure of Blau and Duncan to indicate any plausible connection between fathers’ education and occupation to the son’s education, son’s first job, and son’s occupation at a later date. Sewell, Haller, and Portes developed a path model that included social psychological variables (e.g., significant others, educational and occupational aspirations, academic performance) as well as social structural antecedents of educational and occupational attainment (e.g., SES and mental ability). To address the limitations of the Blau-Duncan model, Sewell, Haller, and Portes added variables to the model that were thought to change the educational and occupational attainment behaviors of persons: educational and occupational aspirations, significant others’ influence, academic performance, SES, and mental ability. The social psychological factors, significant
others’ influence, and aspirations were of central importance in explaining the variance of educational and occupational attainment.

Sewell, Haller, and Portes (1969) reanalyzed data from 739 subjects from the Wisconsin high school seniors who had completed the 1957 senior survey and completed a follow-up survey administered in 1964 by Sewell. Survey participants were males whose fathers were farmers in 1957. The significant others’ variable had a direct effect on three subsequent variables: educational aspirations, occupational aspirations, and educational attainment. In addition each aspiration variable (educational and occupational) had predictive effects on its respective attainment variable. The constructs of educational aspiration, occupational aspiration, educational attainment, and occupational attainment that were examined in this early study continue to be the focus of disciplined inquiry today.

**Summary of theoretical foundations of aspirations.** The evolution of college choice models developed over many years with research on social stratification and status attainment. From the writings of Sorokin and Weber on sociological theory to Blau and Duncan on intergenerational mobility, the research and refinement of status attainment models were an important precursor in the development of college choice models and educational aspirations and the relationship to other variables.

**Educational Aspirations**

Reviewing the literature related to educational aspirations many studies were foundational studies used to support the various models of status attainment and supported the research used to develop the college decision making models. Many of these foundational
research studies examine the impact of student characteristics, significant others’ influence, extracurricular activities, and aspirations.

**Key definitions.** The terms educational aspirations, goals, expectations, and plans have been used interchangeably and have caused confusion in trying to compare various studies. Both Carter (1997) and Brookover, Erickson, and Joiner (1967) noted inconsistencies in defining educational aspirations and educational expectations in numerous studies. Carter (1997) reviewed 52 studies on aspirations covering a period from 1967 to 1996, and categorized the definitions of the variable. These definitions included: (a) plans, (b) expectations, (c) preferences, (d) intentions, (e) predictions, (f) multiple measures (definition contained multiple measures), (g) range of desires, and (h) undefined (variable did not provide enough detail to assess the function). She found that terms were used interchangeably and inconsistencies among measurement tools added to the confusion, raising the point of the importance of differentiating between aspirations and expectations.

Brookover, Erickson, and Joiner (1967) used a longitudinal data set of 377 Caucasian male students to identify the impact of SES and academic achievement on educational plans (expectations) and educational aspirations (desires or wishes). They found educational plans (expectations) are more strongly related to academic performance and SES than educational aspirations. They also noted the importance of clearly differentiating between the terms and appropriately defining the measurement tool. For the purpose of this study, aspirations were defined in terms of wishes or desires and operationally defined through the following survey question (e.g., “As things stand now, how far in school do you want to go?” (National Center for Education Statistics, 2002b)). The decision to use the construct of educational aspirations rather than educational plans or expectations for this study was based on research showing expectations
vary more closely with access to mobility resources than do aspirations (Berman & Haug, 1975), and these mobility variables (gender, race/ethnicity, and SES) are controlled in this study.

According to Holloway and Berreman (1959) and Stephenson (1957) educational expectations (plans) vary in accordance with class level, and expectations are scaled down aspirations based on perceived obstacles. Berman and Haug (1975) studied race and gender in relation to educational discrepancy (the difference between aspirations and expectations) and found minimal variation between males and females, and between Blacks and whites. When race and gender are combined minimal variation is found using Chi-square analysis. Upon stratification of aspiration levels and combining race and gender, significant differences emerge among low aspirants (aspiring to associate or bachelor degree). More females than males and more Blacks than whites showed discrepancies between desired and expected schooling among low aspirants.

Early research on social stratification and the opportunity for higher education were “contingent on characteristics of social origin not related to learning – most notably sex, socioeconomic origins, race and ethnic background” (Sewell, 1971, p. 791). But as researchers (Hossler & Gallagher, 1987; Hossler et al., 1999; Hossler & Stage, 1992) noted, many social, economic, personal, and educational factors influence the decision-making process for college. Educational aspirations are a defined component of the psycho-sociological models derived from status attainment research which focuses on various variables directly and indirectly impacting educational aspirations. Educational aspirations are defined as the post-high school educational goal the respondent would really like to achieve were there no constraints on his/her financial or intellectual resources (Berman & Haug, 1975; Rehberg, 1967). This definition closely aligns with wishes or desires.
Research on aspirations included a variety of variables focusing on race (Garrison, 1982; Gibson, 1991; Hauser & Anderson, 1991; Ogbu, 1991), gender (Alexander & Eckland, 1974; Bell, 1963; Hossler & Stage, 1992; Marini & Greenberger, 1978; Sewell, 1971) and SES (Bennett & Gist, 1964; Bourdieu, 1973; Brookover et al., 1967; Empey, 1956; Kerckhoff, 1976) which led to a more complete model of college choice. A later study on family background characteristics and aspirations by Stage and Hossler (1989) showed the reduced path analysis model for student aspirations varied by gender, suggesting subtle differences in the family (e.g., parental savings, college discussions, single parent families) affected male and female aspirations differently. The reduced path analysis model for males showed significant relationships between student aspirations and both parents’ expectations \((p < .001)\) and father’s education \((p < .05)\). The reduced path analysis model for females showed significant relationships between parents’ expectations \((p < .001)\), father’s education \((p < .05)\), parent’s marital status \((p < .05)\), parents discussion about college \((p < .001)\) and student aspirations. Hossler and Stage (1992) and Marini and Greenberger (1978) found gender impacted educational aspirations directly and indirectly (through GPA and high school activities in Hossler and Stage; through GPA and parents’ education in Marini and Greenberger).

In Hossler and Stage (1992), the standardized path coefficients for the structural model for student aspirations development identified gender to be significantly related to parents’ expectations \((p < .05)\), students’ GPA \((p < .001)\), participation in activities \((p < .001)\), and students’ aspirations \((p < .01)\). The females were found to have higher GPAs, were more involved in high school activities and had significantly higher aspirations compared to males. The causal model tested in this study provided a useful framework that was supported by previous research, but Hossler and Stage noted that existing models were not adequate for some
ethnic groups. Marini and Greenberger (1978) studied the aspirations (desires) of 2,495 eleventh grade students in the Pennsylvania public schools system. This sample represented a random subsample from a stratified random sample of Pennsylvania schools. In contrast to Hossler and Stage (1992), the males had significantly higher aspirations as compared to females.

Student ability has been defined and measured in a variety of ways. Researchers have studied students’ ability through measures of mental ability (Sewell et al., 1957; Sewell & Shah, 1967; K. Wilson & Portes, 1975), self-reported measures of ability (K. Wilson & Portes, 1975), class rank (Sewell et al., 1969) and academic achievement assessed by GPA (Brookover et al., 1967). Many of these studies found a relationship between students’ ability, SES and educational aspirations. Hossler and Stage (1992) found students’ GPA was influenced by parents’ education and student’s gender and ethnicity, and GPA directly influenced aspirations.

Subsequent research on aspirations added parental influence (Rehberg & Westby, 1967; Sewell & Shah, 1968a, 1968b; Simpson, 1962; Stage & Hossler, 1989), peer influence (Alexander Jr. & Campbell, 1964; Haller & Butterworth, 1960; McDill & Coleman, 1965) and high school extracurricular activities (Hamrick & Stage, 1998; Hossler & Stage, 1992; Spady, 1970). Other variables influencing educational aspirations include parental expectations, savings for college, and student ability, and these variables were found to be directly impacted by SES (Hossler et al., 1999). These studies point to the impact of parental expectations and parental education on students’ aspirations for attending postsecondary education. Parent’s education was found to have a significant direct effect on parents’ educational expectations and students’ aspirations. Results on peer influence on students’ aspirations vary among studies and may also be influenced by gender, race, and the age of the student (Cheng & Starks, 2002; Hossler et al., 1999; Kandel & Lesser, 1969). According to Cheng and Starks (2002) there is no difference in
the effect of a friend’s aspirations to go to college between white students and minority students, and Kandel and Lesser (1969) found that peers support the values of the parents.

As previously mentioned, early studies focused on occupational achievement through social mobility by studying a father’s educational attainment and the respondent’s educational attainment (Blau & Duncan, 1967). A more refined social psychological model (also called the Wisconsin Model) evolved from the research of Sewell, Haller, and Portes (1969) which included structural, individual, and interactive variables, and their impact on occupational and educational aspirations and attainment. This study developed a model of attainment based on inputs and their resulting outputs (educational and occupational attainment) by collecting data over a period of time. This concept of a developmental process leading to educational attainment created various types of college choice models focusing on econometric (Bishop, 1977; Manski & Wise, 1983), consumer (Kotler & Fox, 1985), sociological (Sewell et al., 1969; Sewell & Shah, 1968b), and combined theories (Hossler & Gallagher, 1987). Combined theories include a combination of econometric, consumer, and/or sociological models.

The importance of studying student aspirations is demonstrated in studies that show a positive relationship between educational aspirations and the eventual enrollment in a postsecondary institution (Sewell, Haller, & Ohlendorf, 1970; K. Wilson & Portes, 1975). The development of aspirations and decision making involved in choosing a college is more commonly known as college choice.

Other studies focus on the college decision making process with educational aspirations defined as the predisposition phase of the college choice model (Hamrick & Stage, 2004; Hossler & Gallagher, 1987; Hossler & Stage, 1992). Hossler and Stage (1992) define the term student college choice to include “(a) the decision of students to continue their education at the
College Choice and Aspirations

The decision to attend college has been studied using a number of theoretical frameworks. Hossler and Gallagher’s model (1987) has been selected as the framework for this study to evaluate students’ educational aspirations. More specifically in this proposed study, the predisposition phase of Hossler and Gallagher’s model was used to define the control variables that affect aspirations. Hossler and Stage (1992) focused their research on the predisposition phase of Hossler and Gallagher’s model and found the data supported the influence of parents’ education, family income, gender, ethnicity, parents’ expectations, academic abilities, and extracurricular activities on educational aspirations. Student characteristics, significant others’ influences, and extracurricular activities have been studied extensively. By controlling these variables we can then study the impact of other variables on educational aspirations. In this study the researcher looked at participation in credit-based transition programs and its impact on changing educational aspirations after controlling for student characteristics, significant others’ influence, junior-year dual credit completed, and extracurricular activities.

Hossler and Gallagher model. Hossler and Gallagher (1987) developed a combined framework for student college choice. The three-phase model includes predisposition, search, and choice. The predisposition phase is a “developmental phase in which students determine whether or not they would like to continue their education beyond high school” (Hossler & Gallagher, 1987, p. 209). Hossler and Gallagher (1987) noted the predisposition phase had received the least attention from researchers who study college choice. Hossler and Stage (1992)
engaged in additional research on predisposition by developing and testing a structural model of predisposition. They drew from previous status attainment literature, identified a set of variables including student and family background, and high school experiences to build their predisposition model.

Hossler and Gallagher’s (1987) three phases are similar to the three phase models proposed by Litten (1982) and Jackson (1982). Hossler and Gallagher drew on similar constructs of previous models (Jackson, 1982; Litten, 1982) but include the individual and organizational variables that detail each phase of the three-phase model. They suggest each phase produces outcomes that influence the student choice process. Figure 1 summarizes the three-phase choice model of Hossler and Gallagher.

<table>
<thead>
<tr>
<th>Model Dimensions</th>
<th>Influential Variables</th>
<th>Student Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Individual</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Variables</td>
<td></td>
</tr>
<tr>
<td>Predisposition</td>
<td>Student characteristics</td>
<td>College options</td>
</tr>
<tr>
<td>(Phase One)</td>
<td>Significant others</td>
<td>Or Search for other options</td>
</tr>
<tr>
<td></td>
<td>Educational activities</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Organizational</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Variables</td>
<td></td>
</tr>
<tr>
<td></td>
<td>School characteristics</td>
<td></td>
</tr>
<tr>
<td>Search</td>
<td>Student preliminary</td>
<td>Choice set</td>
</tr>
<tr>
<td>(Phase Two)</td>
<td>college values</td>
<td>Or Other options</td>
</tr>
<tr>
<td></td>
<td>Student search activities</td>
<td></td>
</tr>
<tr>
<td>Choice</td>
<td>Choice set</td>
<td></td>
</tr>
<tr>
<td>(Phase Three)</td>
<td>College and University courtship activities</td>
<td>Choice</td>
</tr>
</tbody>
</table>


Hossler and Gallagher (1987) describe the three phases in terms of the impact on the student. The predisposition phase is the period of time when students develop aspirations for
college attendance. The search phase is a point when students gain information to assist themselves in the evaluation of matching self and institution. The choice stage provides the student with a very limited set of possibilities matching the personal and educational needs of the student. In each of the three phases students’ aspirations are influenced by individual or organizational factors. Aspirations in the predisposition phase are considered to be developing and are considered stable or increasing in the search and choice phases (Hossler et al., 1999). In looking at the stability of aspirations, Hossler et al. (1999) found 58% of female ninth-grade students and 52% of male ninth-grade students reported thinking about their futures and 67% of students who decided to attend college in the eighth or ninth-grade enrolled within one year of high school graduation.

The next section of the chapter examines the conception of the predisposition phase according to Hossler and Stage (1992), focusing attention on aspirations and predisposition.

**Aspirations and Predisposition**

Hossler and Stage (1992) examined the relationship between student characteristics including family and student background, student high school variables, and educational aspirations. They studied the following variables to build a causal model for predisposition: (a) SES, (b) student achievement, (c) ethnicity, (d) gender, (e) parental educational expectations and encouragement, (f) high school quality, (g) high school curriculum track, and (h) student involvement in high school activities. Following their research they identified those variables influencing aspirations. Figure 2 represents the predisposition phase of college choice and the associated variables influencing aspirations.
The variable family income was included in the model depicted in Figure 2 even though income did not have a causal relationship in the model since parents’ education and family income can be closely associated and both are linked to SES. A limitation of this study was in the purposeful sampling process that included 2,497 high school students who completed all surveys given to 21 targeted high schools in Indiana. Results therefore have limited generalizability, although they have been published widely in the literature and served as a basis for theory development.

**Aspirations and Student Characteristics**

**Race, ethnicity, and gender.** Researchers have studied the impact of race and gender on educational aspirations, and results have been mixed. An important aspect to consider when reviewing studies on race/ethnicity is the difference that exists among various disciplines with
regard to the importance or significance of studying race/ethnicity. The focus of Fish (2002) is on race and intelligence but Fish notes the important fact that scientifically there is no biological evidence to differentiate between what is defined by many researchers as race/ethnicity. From an anthropological standpoint, differences among people of the earth are socio-cultural differences rather than biologically based differences. Fish notes, “the classification of people into biological races has long been known by anthropologists to be scientifically inaccurate, but reflective instead of American folk beliefs” (2002, p. 3). Fish surmises through scientific evidence and argument that the concept of human biological races was constructed socially and historically through 17th and 18th century European thought and that racial categories were developed to serve social ends, including the justification and perpetuation of inequality.

After reading through Fish’s arguments, this researcher does recognize the differences in perceptions of the value of categorizing data based on race/ethnicity. Unfortunately in some disciplines this type of categorization seems to be the norm and the desire to look at data from different perspectives appears to be easily accomplished through racial categorization. The focus of interpretation of categorized information should be on social and cultural differences as opposed to differences in the physical characteristics of hair and/or skin color.

Gist and Bennett (1963) studied the occupational and educational aspirations of African Americans and white students. Members of the sample of 873 ninth and twelfth grade students were neither the wealthiest nor the most impoverished attending their school(s), providing a crude means of controlling for SES. They also controlled for intelligence quotient (IQ). Results of this study showed no difference between African American and white student educational or occupational aspirations and expectations. However, whites, more than African Americans tended to decide against a future education. The measurement of educational aspirations was
limited to the following options: (a) will continue education, (b) undecided, and (c) will not continue education. Identifying aspirations through the above definition does not differentiate desire from expectation, therefore limiting interpretation. Gist and Bennett also found higher mobility aspirations (defined by aspirations three or more levels above their fathers) in African Americans compared to whites and African American girls had particularly high mobility aspirations.

Some race studies compared African American and white students (Garrison, 1982; Gist & Bennett Jr., 1963; Hauser & Anderson, 1991; Hauser & Featherman, 1976; Portes & Wilson, 1976). Portes and Wilson (1976) found differences in the factors or variables (parental socioeconomic status, ability, grades, self-esteem, educational aspirations) in the Wisconsin model of educational attainment based on race. They studied more than 2,000 tenth grade boys in a longitudinal study from a multi-stage probability sampling from 87 high schools randomly selected from across the United States. Using standardized path models, Portes and Wilson (1976) posited the existence of separate or distinctive African American and white mobility processes based on their findings of stronger relative roles of parental economic status, measured ability, and school grades among whites, and of self-esteem and educational aspirations among African Americans.

Kerckhoff and Campbell (1977) modified the Wisconsin model of educational attainment developed by Sewell et al. (1969) by adding three variables: academic ability at two stages of the students’ secondary schooling (junior high GPA and senior high GPA) and disciplinary activity that occurred during the junior high school years. Kerckhoff and Campbell determined educational attainment in African Americans was not a function of early academic success or SES although these variables played a role in the educational attainment of whites. The crucial
factor in the attainment process for African Americans was high school academic performance. Like Portes and Wilson, Kerckhoff and Campbell showed that the process of educational attainment varies for different races and a standard model might be problematic when applied to all students.

Marini and Greenberger (1978) studied a random sample of 2,495 eleventh-grade students (1,226 boys and 1,269 girls) in a Pennsylvania public school district and found boys both aspired to and expected higher levels of educational attainment than girls, and there was a greater discrepancy between aspirations and expectations for girls. Marini and Greenberger controlled for both SES and academic ability and showed that both SES and academic ability had a greater effect on educational attainment for boys than for girls. Marini and Greenberger differentiated aspirations from expectations through their survey questions. They measured aspirations by asking the student to indicate the highest level of schooling they desired to attain, and measured expectations by asking the student to indicate the highest level of schooling they expected to attain.

Kao and Tienda (1998) studied the educational aspirations of minority youth using the National Education Longitudinal Study of 1988 (NELS:88) for 1541 students participating in subsequent surveys in 1990 and 1992. They studied the change in aspirations of youth from the eighth grade through the twelfth grade of high school using a combined theory of status attainment (Sewell et al., 1969) and the blocked opportunity theory (Gibson, 1991; MacLeod, 1987; Ogbu, 1991). The blocked opportunity theory can be viewed from two perspectives. One perspective is the overachievement of students to compensate for perceived liabilities associated with minority status (Sue & Okazaki, 1990) and the other perspective is educational
underperformance if the racial group is skeptical about the link between education and higher mobility (Gibson & Ogbu, 1991; Ogbu, 1991).

Like others (e.g., Kerckhoff & Campbell, 1977; Perna, 2000a) Kao and Tienda (1998) suspected the development of aspirations in minority youth does not fit the status attainment model for white students. In addition to the quantitative aspect of their study, Kao and Tienda followed up their study of whites, African Americans, Asians, and Hispanics with a qualitative study involving focus groups. Distinct ethnic and race patterns in the concreteness of educational aspirations were noted, providing or giving support to the blocked opportunity theory in minority students’ development of educational aspirations. They found that while African Americans and Hispanics have high aspirations at some point in time, they are less likely to maintain these aspirations from eighth grade through twelfth grade. They also reported that “gender is more influential in the formation of aspirations prior to high school, at which time sex differences remain relatively stable” (p. 375). Females tended to have higher aspirations by the tenth grade than males. Their study included the following variables: (a) SES, (b) parents’ education, (c) family structure, (d) educational resources at home, (e) outside classes, (f) immigrant mother, and (g) students’ previous school experience as control variables. The model also included a change in aspirations variable based on previous years’ aspirations. Aspirations were measured in the eighth, tenth, and twelfth grades.

Perna (2000a) expanded the econometric college decision-making model to include social and cultural capital in an effort to create a better fit for predicting college attendance of ethnic minority students at four-year institutions. She used the 1992-1994 National Education Longitudinal Study (NELS:92/94) database for her study and defined social and cultural capital by parents’ education, expectations, encouragement, involvement, others’ help, school quality,
public/private status, use of college test prep tools such as classes, computer programs or tutors, and school location and diversity. Controlling for all other variables and adding proxies for social and cultural capital to the model improved the fit of the model for white, African American, and Hispanic students. Perna found academic ability and social and cultural capital are significant to the college attendance decision for all groups (white, African American, and Hispanic) but in different ways. The variables most important in determining college attendance for white students are academic ability, followed by social and cultural capital. In contrast, African Americans and Hispanics showed academic ability, and social and cultural capital contributed equally in predicting four-year college enrollment.

Chenoweth and Galliher (2004) studied a group of 242 students in rural West Virginia to determine the impact of cultural and economic conditions on students’ educational aspirations. They found no significant differences between males and females; however the two genders appeared to arrive at a decision by different pathways. Family and peers influenced each gender differently. The researchers speculated males who socialize in a working class environment may develop dismissive attitudes toward higher education and females may view higher education as a source of independence or a way out of their current situation. They found the significant predictor variables associated with education aspirations for males are perceived intelligence, friend’s plans for college, and either parent attending college. The significant predictor variables associated with education aspirations for females are high school curriculum and perceived intelligence.

In the Hossler and Stage study (1992), gender was directly related to students’ aspirations but overall studies about gender and aspirations are contradictory. Hossler and Stage concluded that attempts to determine the influence of race on the development of educational aspirations are
complex and any associations found between race and the development of educational aspirations are indirectly related through variables such as high school activities, ability, or parents’ expectations levels.

Mau and Bikos (2000) studied a nationally representative sample of tenth-grade students using the National Educational Longitudinal Study from 1988 through 1994 (NELS:88/94, base year through third follow-up) which followed the students for two years beyond high school. They found students showed increases in educational aspirations over time regardless of race and gender. Asian Americans had the greatest increase in educational aspirations compared to other groups, and female students had higher educational aspirations than males.

**Academic ability.** Ability has been defined and measured differently in research on educational aspirations and college choice. Sewell and Shah (1968b) and Sewell, Haller, and Straus (1957) used the Henmon-Nelson Test of Mental Ability. This measure is a standardized test that was established for the State of Wisconsin. Ability has also been measured as a function of academic performance, the GPA. This measure too has been differentiated by course specific calculations and by overall school GPA. Research on academic ability, typically measured through GPA or ability test scores, suggests a positive relationship to predisposition toward college enrollment (Hossler et al., 1999). Academic ability and achievement are predictors of both aspiration development and interest in a college education, and subsequent college attendance (Hossler, Braxton, & Coopersmith, 1989; Hossler et al., 1999; Manski & Wise, 1983; Sheppard, Schmit, & Pugh, 1992).

Brookover, Erickson, and Joiner (1967) studied longitudinally a population of 377 white male students beginning in eighth grade and continuing into the eleventh grade to determine if educational aspirations and expectations were related to academic achievement and
socioeconomic status. They defined GPA as a composite score in English, social studies, math, and science and found educational aspirations and expectations were positively correlated with academic achievement and SES.

Harrison (1969) studied the impact of performance in school controlling for SES and gender. He studied 160 middle- and low-income successful and unsuccessful students. Success was defined by GPA and overall school achievement and Harrison found aspirations in successful students were significantly different from aspirations in unsuccessful students when controlling for gender and SES. Successful students expect and desire more education than do unsuccessful students. In addition, Harrison found aspirations of middle class students differed significantly from lower class students when controlling for gender and school performance. Middle class students expect more education than do lower class students.

Sewell, Haller, and Portes (1969) used both academic performance and mental ability in their study of the causal sequence of educational and occupational attainment in their study of 739 male students. They used SES and mental ability as the commencing variables in their path model to occupational and educational attainment. These researchers measured students’ academic performance using a transformation of the students’ rank in the high school class. Mental ability was measured using the Henmon–Nelson test score. Sewell, Haller, and Portes found mental ability had a direct impact on academic performance. Interestingly, academic performance indirectly impacted aspirations through significant other’s influence (index of parents’, teachers’, and peer influence) which Sewell et al. suggest provides evidence that others’ perceptions can align with the demonstrated ability of the student.

Wilson and Portes (1975) wanted to analyze more timely data and compare the status attainment model developed by Sewell and his associates (Sewell, 1971; Sewell et al., 1970;
Sewell & Shah, 1968a) to determine if any differences exist in the model between previously used objective variables and the current use of subjective variables. This longitudinal study of 2,213 males was drawn from a multistage probability sample and was surveyed in the tenth grade (fall 1966) of high school. Subsequent surveys took place in the spring of 1968 and 1969 and the spring and summer of 1970. After attrition, the responses were reduced to 1,620.

Wilson and Portes (1975) used a self-assessment of school ability based on the students’ responses to three questions pertaining to self-ratings on general school ability, intelligence, and reading ability. Wilson and Portes studied the impact of the self-assessment of school performance variable and determined the association between self-assessment, aspirations, and attainments were spurious and considered to be a consequence of the common dependence on mental ability and academic performance. The variable representing academic performance was the average score between the respondent’s self reported GPA in the ninth and tenth grades. Research supported by Jung and Moore (1970, Winter) and Hanna, Bligh, and Lenke (Hanna, Bligh, & Lenke, 1970) provided Wilson and Portes with evidence that a self-reported measure of GPA is a generally good substitute for school reported grades. They found measured mental ability was the strongest determinant of occupational aspirations but academic performance was the strongest influence on educational aspirations. The change in the theoretical model reflected a process in which personal influences and subjective orientations were less significant in the development of aspirations compared to structured and objective measures of parent resources and ability. Wilson and Portes found that ability and SES were important factors throughout the process of attaining an education. They also found that aspirations showed a strong effect on education attainment but failed to mediate the effects of ability and SES.
Tuttle (1981) studied a subsample of 14,287 high school seniors from the High School and Beyond Study of 1980. Student achievement variables were measured by both standardized test scores and high school grades and were found to be the highest contributors to the college going decision of high school seniors. In a reduced path model, he found high school grades and academic ability to produce a total causal impact of .261 and .290 respectively. High school grades were coded as eight discrete categories ranging from mostly A’s = 8 to mostly below D = 1. Academic ability was measured by five standardized test scores provided by students participating in the High School and Beyond study.

In the Hossler and Stage (1992) study, GPA exerted a strong direct influence on student’s aspirations. Later research of Hossler et al. (1999) showed students who earn better grades receive encouragement not only from parents but from peers, teachers, and other family members to continue their education. As Hossler et al. (1999) noted, grades are an indicator of success and success itself encourages students to continue in the activity involved with success – school.

Year in high school. According to Hossler and Stage (1987) most high school students formalize their educational plans between the eighth and tenth grade in high school. Hossler et al. (1999) specifically started their longitudinal study with ninth grade students in order to track the students’ shifts in plan over time and found 67% of students who decided in the eighth or ninth grade enrolled in college immediately following graduation. They noted once students begin to articulate plans to go to college it becomes more difficult to change them. Those students who were undecided in ninth grade became more certain over time as the percentage identifying college after high school increases during sophomore and junior years. The
percentage of students identifying the military or work after high school changes only by a
couple of percentage points from ninth grade to eleventh grade.

In the Hossler et al. (1999) longitudinal study of ninth graders, the researchers posed two
important questions. The first question focused on the chronological development of
postsecondary plans and aspirations of high school students, and the second question asked about
the people and experiences that influenced those plans. They used the terms aspirations and plans
interchangeably. Student aspirations in the college choice model are defined by levels of
education, and students identify their plans based on what level of education they aspire to attain.
Some interesting experiences noted by Hossler et al. (1999) include the following: (a) as students
approach their senior year, a larger number of students choose to attend college; (b) parental
support and encouragement are key factors in the educational aspirations of students between
ninth and eleventh grades; (c) by the twelfth grade some parents’ expectations for their children
declined, especially those categorized as low income, low educational level, and having children
with low GPA; and (d) as students approach the twelfth grade the educational decision making
process has moved from predisposition to search and choice phases of the process. In this phase
there are more external influences (peers, teachers, counselors) impacting the search and choice
phase of the decision making process.

**Summary of aspirations and student characteristics.** Research on aspirations and
student characteristics show mixed results among the researchers, but it is important to note that
the time the research was performed may have impacted results based on social and culture
differences evident at the time. Gist and Bennett (1963) found no significant differences between
African Americans and whites in educational and occupational aspirations with SES and IQ
controlled. Other studies (Kao & Tienda, 1998; Kerckhoff & Campbell, 1977; Perna, 2000a;
Portes & Wilson (1976) focused on variables and pathways that define the development of educational aspirations and attainment among various race and ethnic groups. The structural path models used in status attainment theory and used to define educational attainment for whites were not the same used for other ethnic groups. Social and cultural influences were found to impact educational aspirations and attainment differently for the different racial groups.

Kerckhoff and Campbell (1977) determined educational attainment in African Americans was not a function of early academic success or SES although these variables played a role in the educational attainment of whites. The crucial factor in the attainment process for African Americans was high school academic performance. Portes and Wilson (1976) found differences in the factors or variables (parental socioeconomic status, ability, grades, self-esteem, educational aspirations) in the Wisconsin model of educational attainment based on race.

Gender differences impact educational aspirations and attainment differently and can vary according to the time (age of the student) the research was completed. Kao and Tienda (1998) found gender differences in the formation of aspirations prior to high school and by the tenth grade females tended to have higher aspirations than males. On the other hand, Marini and Greenberger (1978) found eleventh grade boys have higher educational aspirations and expectations than eleventh grade girls and the gap between aspirations and expectations is larger in girls than boys. Mau and Bikos (2000) studied aspirations two years after high school and they found educational aspirations increased over time regardless of race and gender.

Academic preparation and achievement are predictors of both aspirations for a college education, and subsequent college attendance (Hossler et al., 1989; Hossler et al., 1999; Manski & Wise, 1983). Academic achievement is positively correlated with educational aspirations (Brookover et al., 1967; Harrison, 1969). Hossler and Stage (1992) noted the strong direct impact
of GPA on the predisposition phase of decision making and Hossler et al. (1999) noted the influence of others (parents, peers, teachers, and family) through encouragement to continue their education when students perform well academically.

As previously mentioned, the age of the student is important in the development of college aspirations. Plans begin to formalize between the eighth and tenth grade in high school. Once plans are articulated it becomes more difficult to change them (Hossler et al., 1999). As students approach the twelfth grade they move from the predisposition phase to the search and choice phase of the decision making model. Hossler et al. also noted that as students approach the search and choice phase the impact of external (peers, teachers, counselors) influences are greater.

Aspirations and Significant Others

**Parent’s level of education.** Parents’ level of education has been studied to determine the impact of the parents’ education or lack of education on their children’s aspirations (Kahl, 1953; Krauss, 1964). Early studies had their limitations due to small sample size, studying males only, and a failure to use representative sampling techniques. Sewell and Shah (1968a) improved upon the previous studies by including females, accounting for the students’ intelligence, and using a large sample for the study. They studied the combination of father’s education and mother’s education, the child’s measured intelligence, student perceived parental encouragement, college plans, college attendance, and college graduation for males and females. They determined that parents’ education, whether considered separately or jointly (in the form of interaction terms) was positively related to both educational aspirations and achievements in both males and females but the additional amount of variance explained by adding the interaction
terms was negligible. They also found differences between fathers’ and mothers’ educational influence varied with the intelligence of the student. The mothers’ education exerted greater influence than the fathers’ education on aspirations and achievements of students with lower intelligence whereas the reverse was true for students with higher intelligence. Sewell and Shah also found a father's education showed a slightly stronger effect than the mother's education on perceived parental encouragement, college plans, college attendance, and college graduation for males; but for female students the effects of both father's and mother's education were almost equal.

Horn and Nuñez (2000) noted in their study of the NELS:88/94 data that as parents’ educational levels rose so did the family income. Also, the family structure was more likely to remain a two parent household family when parents’ educational levels were higher. Parents who attained no more than a secondary education were less likely to have children who would aspire to a bachelor’s degree (Horn & Nuñez, 2000) and more likely to have students who were less academically qualified (Berkner & Chavez, 1997) than students with college educated parents.

Hahs-Vaughn (2004) studied the impact of parents’ education level on first generation and non-first generation college students using Terenzini’s Theoretical Model of College Impact (1996). She wanted to understand if and/or where parents’ education impacts the college experience process. Terenzini’s college experience model incorporates three components: (a) precollegiate traits, (b) collegiate experiences (curricular, in-class, extracurricular experiences, and institutional context), and (c) educational outcomes. Terenzini’s precollegiate traits (the first step in his longitudinal model) include variables that coincide with this study and include academic ability, father and mothers’ education level and employment, income, and SES.

The Hahs-Vaughn study examined a subgroup of 1,629 first-time, traditionally aged
college students from the 1990/1992/1994 Beginning Postsecondary Student (BPS) Longitudinal Study. The subgroup consisted of 29% first generation students and 71% non-first generation students. First generation college students are defined as “students who are first in their immediate family to enroll in college” (Hahs-Vaughn, 2004, p. 485). Focusing on the factors impacting the precollegiate traits, first generation students commonly possess less family income and less encouragement from parents (Terenzini et al., 1996). According to Riehl (1994) first generation college students have lower college entrance exam scores and are less confident about college academic achievements. Hahs-Vaughn studied students’ aspirations for college at the beginning of college and four years later, and found first generation students aspired to lower levels of postsecondary education as compared to non-first generation students. Interestingly, precollegiate variables (e.g., ability index, standardized test scores, expected education level, father and mother’s education level, income, SES) were a stronger influence on non-first generation college students on both college experiences and college outcomes as compared to first generation students. In non-first generation students precollege traits were a stronger influence on the college experience and what happens four years after beginning college than first generation students.

Parental education had a direct effect on the college aspirations of ninth grade students and an even greater impact on actualization of students’ college plans, based on studies by Hossler et al. (1999) and Hossler and Stage (1992). Choy (2002) noted a young person’s likelihood of attending a four-year college increased with the level of their parent’s education, but she noted that participation in rigorous high school math curriculum can mitigate the effect of the parents’ lack of a college education. Hossler et al. (1989) explained “the evidence suggests the level of parental education exerts a strong influence upon predisposition toward
postsecondary education, more than either SES or student ability” (p. 256). Parents education influences the type of institution a student selects regardless of a student’s academic ability and achievement (Hearn, 1991).

**Parents’ employment, occupation, and socioeconomic status.** The parents’ role in promoting social, emotional, and academic growth of their children should not be ignored in encouraging children to aspire to higher levels of education (U.S. Department of Education, 1994). A parent’s educational aspirations for their child influences the child’s expectations for education (Hanson, 1994). Researchers in the past argued the greatest factor in determining whether a child would attend college was whether a parent attended college (Tierney, 2002). As a result, social class became a determining factor in college attendance and has therefore been studied extensively (Brookover et al., 1967; Harrison, 1969).

A number of studies looking at the success of at-risk students in the educational pipeline try to explain the successful navigation of the education system by those unlikely to be successful (Horn, 1997; Horn & Chen, 1998). Horn (1997) identified at-risk students by a number of characteristics,

These included being from a single parent household, having an older sibling who dropped out of high school, changing schools two or more times other than the normal progression (e.g., from elementary to middle school), having C’s or lower grades between sixth and eighth grades, being from a low socioeconomic status (SES) family, or repeating an earlier grade. (p. iii)

Using data from NELS:88/94, Horn and Chen (1998) identified between 1700-2900 students as moderate to high risk of dropping out of school based on a variety of risk factors, and examined the experiences of those youth that not only managed to graduate from high school but entered postsecondary education. They found parental involvement, peer influence, and participation in college prep activities had some of the strongest effects on enrolling in postsecondary education.
Horn and Nuñez (2000) used the NELS 88/94 data to compare first generation students with their peers whose parents had some college or graduated from college and noted first generation college students are less likely than their peers to participate in academic programs leading to college enrollment, but students participating in higher level math programs increased their chances of enrolling in college. In addition, those students who had parents participating in college activities and help from school personnel increased their chances of enrolling in college.

Research on educational aspirations found relationships of significance between aspirations, SES, locus of control, and academic ability (Flowers, Milner, & Moore, 2003; Rene Smith-Maddox, 1999). Smith-Maddox (1999) studied cross-sectional data on 3,009 African American eighth graders using the NELS:88 database. She used communication with other adults, parental network, parents’ educational level and SES as measures of social resources, and she used parents’ expectations, activities outside of school as cultural resources and parental involvement as the cultural capital measure. Results showed poverty status was a significant negative predictor of aspirations. Students’ aspirations and outcomes are influenced by their social networks and cultural resources, their curriculum track placement, and their social class.

Using a large national data set, NELS: 88/92, Hamrick and Stage (1998) studied student and school characteristics for comparison (aggregate versus disaggregate data) to verify if aggregate data could mask the importance or misrepresent the predictive value of some variables in the student college choice model. Using LISREL path analysis, they studied five groups (all schools, select schools with high percentages of minority students and high percentages of students receiving free or subsidized school lunches, and African Americans, Latino/Latinas, and Anglo Americans from select schools) for comparison. The groups consisting of all schools and select schools (high minority, high free or subsidized school lunch) represented aggregate data.
Each subgroup consisted of 300 eighth grade students randomly selected from their assigned larger groups. Significant factors in predicting college aspirations included family SES, parental expectations, and GPA were present in both aggregate models (eighth graders from all schools and eighth graders from high minority, low income schools). Family SES was a significant direct predictor of college aspirations in both aggregate models. In analyzing the subgroups, for Latino/Latinas and Anglo Americans the family SES factor was a direct significant predictor in determining college aspirations. This was not the case for African Americans as the variable indirectly impacted aspirations through the parental expectations and GPA variables. As a result of disaggregating the data differences in aspiration development among the ethnic groups were identified.

**Parents’ expectations.** The influence of significant others has been studied using various definitions for the variable. Some definitions used a combination of variables including parents’ education and occupation (Blau & Duncan, 1967; Rehberg & Westby, 1967; Sewell & Shah, 1968a; P. Wilson & Wilson, 1992), family influences including family size and parental encouragement or expectations (Bennett & Gist, 1964; Krauss, 1964; Nelson & Simpkins, 1973; Rehberg & Westby, 1967; Sewell & Shah, 1968b) and the influence of peers (Alexander Jr. & Campbell, 1964; Duncan, Haller, & Portes, 1968; Haller & Butterworth, 1960; Krauss, 1964; K. Wilson & Portes, 1975). Early studies on status attainment determined the influence of significant others to be important in the development of aspirations as well as attainment. Significant others directly influenced both aspirations and educational attainment (Sewell et al., 1970; Sewell & Hauser, 1972). Parental expectations and encouragement have been identified as having a significant influence on the likelihood of postsecondary attendance (Hossler & Stage, 1992; Mau & Bikos, 2000; Stage & Hossler, 1989).
Conklin and Dailey (1981) studied 2,700 students in southern New York in a four-wave longitudinal study to determine the relationship between the consistency of parental educational encouragement over time and the educational outcomes of students. They defined consistency by measuring parental encouragement in the ninth, tenth, and twelfth grades to see if responses were the same for each year. They found with the presence of parental encouragement from ninth grade to graduation, students were more likely to attend college. Parental encouragement was also linked to the type of institution a student selected to attend. Students who received consistent parental encouragement had the following college enrollment patterns: (a) 49.7% attend a four-year institution, (b) 40.5% attended a two-year institution, and (c) 9.8% did not attend college. Inconsistencies in parental support led to only 55.4% of this group attending postsecondary education with 38.7% attending a two-year institution.

Wilson and Wilson (1992) studied 2,896 high school seniors living in two parent families from the High School and Beyond (HSB: 80/84) data set. They defined parental encouragement by the parents’ involvement in school work and providing direction to the student regarding high school plans. Using logistic regression models they found significant effects on aspirations for parents’ educational level, perceived aspirations of the parents for their child, and parents’ influence on high school plans.

Hossler et al. (1999) and Stage & Hossler (1989) noted parental expectations and encouragement have the greatest effect on the predisposition phase (educational aspirations) of the college decision-making process. Most college choice research focuses on the role of parents in the decision making process of students attending four year colleges or universities. Bers and Smith (1989) conducted one of the first studies for community college students. They reported
the parents’ involvement and interest in being informed during their children’s decision process were present, but parents were not the initiators or the decision makers in the process.

Bers and Galowich (2002) received survey data from 225 households (33.5% response rate) from a single community college district. Many of the parental respondents were educated (49% had at least one parent with a bachelor’s degree or higher and 38% had one parent with at least some college experience) and Caucasian (79%). Student data was retrieved from college data systems and included placement test scores, GPA, and credits earned. Later, a parent focus group was convened to explore the role of parents in college decision making. They learned that parents of community college students want and expect their children to earn at least a bachelor’s degree, with approximately 20% anticipating their students will earn an associate’s degree first. They noted the following about parents and the community college,

Parents value student outcomes that relate in large part to academic achievements and increased focus and confidence, including earning credits and GPAs that will transfer, improving academic skills, gaining a sense of direction, and improving self-confidence. They see academic skill level and maturity as linked, with those who report maturity levels high also perceiving higher academic skill levels. (p. 71)

Moreover, they found an association between the timing of the decision to attend college and the decision to attend the community college. Community college students made their decisions closer to graduation or even after high school graduation. Parental involvement varied with 19% of parents noting no involvement, 31% involved during the students’ freshman/sophomore high school years, 46% involved during students’ junior/senior high school years, and 4% only after their students’ high school graduation.

Cheng and Starks (2002) studied the impact of parental expectations, and the influence of teachers, relatives, and peers on the educational expectations of tenth grade students in the first follow-up study of NELS:88 across various ethnic groups (Asian Americans, African Americans,
whites, and Hispanic Americans). A total of 17,002 students (American Indians excluded, due to low number, and also those missing data or responses as unknown) were studied, controlling for SES, academic performance, gender, and family structure (number in household, parent structure, and siblings). They found Asian, Hispanic, and African American parents hold higher educational aspirations for their students compared to white parents. They also found the relatives’ influence is greater in African American and Hispanic students while teachers’ and friends’ influence are similar for all ethnic groups.

Okagaki and Frensch (1998) studied the parents of 275 fourth and fifth grade students in a suburban school district in northern California. These parents and their children were identified as Asian-American, Latino, and European-American. The purpose of the study was to identify differences, if any, in school performance and parental beliefs between and within the ethnic groups. This study grouped parental belief and behavior scales into four clusters: (a) educational attainment, (b) grade expectations, (c) childrearing beliefs, and (d) self-reported parenting behaviors and parental efficacy. They found Asian-American parents had higher ideal, expected, and minimum education attainment for their children than European-American parents and Latino parents. Asian-American parents’ minimal expectation for their children was college graduation.

In studying children’s grades and educational attainment while controlling for children’s prior academic performance and parents’ perceptions of their children’s abilities, they found differences still existed across the ethnic groups. Okagaki and Frensch found children’s grades were positively and significantly correlated with expected years of schooling among Asian-American and European-American parents, but not Latino parents. These differences supported the hypothesis that cultural differences in beliefs existed across the groups.
Peer influences. The role of peers in social and academic development has been debated and discussed but as Tierney and Colyar (2005) indicate, “if education is a social undertaking, then the role of peers in learning is of critical concern” (p. 49). The impact of friends on a students’ desire to go to college may be due to the likelihood that individuals associate with individuals with similar interests (Krauss, 1964). Krauss (1964) found in a survey of 706 high school seniors that working class students who have acquaintances who plan to go to college are more likely to aspire to college themselves.

Sokatch (2006), in his subset of NELS:88/94, looked at the influence of peers and the college-going plans of 481 low income, urban minority youth compared to a representative sample of 481 high school graduates. Sokatch found significantly stronger statistical association between peer influence and postsecondary enrollment at a 4-year institution in the study group (sample of low income, urban minority student from public high schools) than in the control group (comparison sample of all U.S. high school graduates) after controlling for demographic, academic, family, financial aid information, and school composition. These variables were identified in the literature as influencing the college-going decision process.

Overall, research on peer influence has been mixed, but as Tierney and Colyar (2005) suggest, many facets of the educational process add to the complexity of studying peer influence. Studies addressing the concerns with studying peer influence include: (a) homophily (Krauss, 1964); (b) comparisons with family influence (Davies & Kandel, 1981; Kandel & Lesser, 1969); (c) identity formation (Coleman, 1961); and (d) peer status (McDill & Coleman, 1965). In light of some of the conceptual confusion, Tierney and Colyar affirm peer group affiliation as an important component of educational success.
Summary of aspirations and significant others. Sewell and Shah (1968a) determined that parents’ education, whether considered separately or jointly was positively related to both educational aspirations and achievements. A parent’s educational aspirations for their child influences the child’s expectation for education (Hanson, 1994) and a parent’s education influences the type of institution a student selects (Hearn, 1991). Students whose parents attained no more than a secondary education were less academically qualified for college (Berkner & Chavez, 1997) and were less likely to aspire to a bachelor’s degree (Horn & Nuñez, 2000).

Smith-Maddox (1999) showed poverty status was a significant negative predictor of aspirations in African Americans. But Hamrick and Stage (1998) showed SES was not a significant predictor of college aspirations in African Americans but indirectly impacted aspirations through parental expectations and GPA variables. Anglo Americans and Latino/Latinas college aspirations were directly impacted by family SES.

Parental expectations and encouragement have a significant influence on the likelihood of postsecondary attendance (Hossler & Stage, 1992; Mau & Bikos, 2000; Stage & Hossler, 1989). In fact, Hossler et al. (1999) note parental expectations and encouragement have the greatest effect on educational aspirations. Conklin and Dailey (1981) found students who experienced consistent parental encouragement (ninth grade through graduation) were more likely to attend college. Asian American, Hispanic American, and African American parents hold higher educational aspirations for their students compared to white parents (Cheng & Starks, 2002). Asian American parents’ minimal expectation for their children was college graduation (Okagaki & Frensch, 1998).

The role of peers in social and academic development has been debated. The impact of friends on a students’ desire to go to college may be due to the likelihood that individuals
associate with individuals with similar interests (Krauss, 1964). Sokatch (2006) found
significantly stronger statistical correlation and association between peer influence and
postsecondary enrollment at 4-year institutions in the study group (low income urban minority
public high school graduates) compared to the control group (comparison sample of all U.S. high
school graduates). Aside from the complexities associated with studying peer influence, Tierney
and Colyar (2005) affirm peer group affiliation as an important component of educational
success.

Aspirations and Extracurricular Activities

Hossler and Stage (1992) found extracurricular activity is another variable impacting the
predisposition phase (educational aspirations). There are many studies of students’
characteristics and significant others’ influence (Bennett & Gist, 1964; Cheng & Starks, 2002;
Garg, Melanson, & Levin, 2007) but fewer studies focus on extracurricular activities and college
aspirations (Alfeld, Hansen, Aragon, & Stone, 2006; Hamrick & Stage, 1998; Otto & Alwin,
1977; Spady, 1970). Extracurricular activities have been traditionally defined as participation in
athletics, student government, and student clubs or organizations and have been found to have
mixed results on the educational aspirations of students (Hearn, 1984; Hossler & Stage, 1992;
Stage & Hossler, 1989). In general, these studies show the greater the involvement of students in
extracurricular activities the more likely the students are to have higher educational aspirations.

Spady (1970) found participation in extracurricular activities played a part in
differentiating high aspirants from others in his study of 297 senior boys in two neighboring
West Coast high schools in 1963 and four years later in 1967. The purpose of his study was to
research a student's peer status and his extracurricular participation in high school and their effect
on the student’s educational aspirations, subsequent college attainments and persistence in college, holding constant family SES, Intelligence Quotient (IQ), and grades. Spady defined participation in extracurricular activities into three categories: (a) varsity sports, student offices, and service organizations; (b) other activities, and (c) no participation. He found participation in service and leadership roles impacted educational aspirations by encouraging social integration, by improving self-esteem, and by providing skills and resources necessary for success in college. He notes,

Educational aspirations become a proxy for high status and personal recognition...by providing opportunities for success that lie outside the formal academic structure and by helping students to develop attitudes and skills that will bolster those aspirations. (p. 700)

Otto (1976) found similar results in his study of 442 students in that extracurricular activities were a means to increase social integration that raised educational aspirations.

Hossler et al. (1999) emphasized the social, academic, family, and economic variables that influence educational aspirations but recognized the importance of understanding student participation in extracurricular activities even though this dimension was not part of their study. They state “the degree of student involvement in high school activities may be an indicator of overall levels of motivation and self-confidence” (p. 27). But interestingly, Hamrick and Stage (1998) found differing relationships between college predisposition and school activities by ethnicity and SES.

Using the NELS:88 data set, Hamrick and Stage (1998) randomly selected 300 cases from the original data set of 20,233 eighth graders (Model 1). In addition they identified 1,977 eighth graders from specifically selected schools that represent high minority enrollment (over 40%) and a high rate of school lunch program participation (over 50%), and randomly selected 300 students to create another aggregate group (Model 2). Analysis was done on disaggregated
groups of Latino/Latinas (Model 3), African Americans (Model 4), and Anglos (Model 5), randomly selected to equal 300 participants per group. Model 1 showed significant factors for college predisposition included family SES, ethnicity, parental expectations, GPA, and participation in school activities. In Model 2, the high minority and low income group, changes were seen in ethnicity and participation in school activities no longer being significant factors in college predisposition. Within the Latino/Latinas and Anglo American groups’ college predisposition was significantly related to family SES, unlike the African American group. When the data was disaggregated into Latino/Latinas, African Americans, and Anglo Americans, there was no significant relationship between participation in school activities and college predisposition. Hamrick and Stage noted the importance of the results being masked when using large aggregate data sets without interaction terms including race.

Recently Alfeld, Stone, Aragon, Hansen, Zirkle, Conners et al. (2007) examined student participation in student leadership organizations associated with Career and Technical Education (CTE). Career and Technical Student Organizations (CTSO) demonstrate four organizational elements that make them unique. These include leadership, professional development, community service, and competitive events. This study looked at the linkages between participation in a CTSO and the psychosocial variables of attitudes and behavior (academic motivation, academic engagement, and civic engagement) and achievement indicators (career self-efficacy, grades, college aspirations, and employability skills).

A total of 1,797 participants completed the surveys and the students were categorized into three comparison groups: (a) CTE students with CTSO participation, (b) CTE students without CTSO participation, and (c) general student population. They controlled for student demographics, participation in extracurricular activities, work experience, and volunteer service.
Alfeld et al. used a variety of items and scales (e.g., Youth Experience Survey, High School Survey of Student Engagement, Motivated Strategies for Learning Questionnaire) to measure the achievement indicators (e.g., grades, aspirations, career self-efficacy, employability skills) and behaviors (e.g., academic motivation, academic engagement, civic engagement). They found that participating specifically in leadership and professional development activities in a CTSO raised students’ educational aspirations. In general, Alfeld et al. found lower college aspirations in CTE students compared to non-CTE students which is consistent with previous findings (DeLuca, Plank, & Estacion, 2006; Levesque, 2003). They found the more students participated in CTE organizations (CTSO), the higher their academic motivation, academic engagement, grades, career self-efficacy, college aspirations, and employability skills. These results were identified in the pre-phase of the study. When compared at the end of the academic year, CTSO students gained less in a change in educational aspiration compared to general students and there was no difference in change in aspirations between CTSO and CTE students.

Besides extracurricular activities studied by Spady (1970), Alfeld et al. (2007), and Hamrick and Stage (1998) it is important to consider educational opportunities that have been implemented in high schools to address preparation for college and give students an opportunity to experience the demands of college-level learning while still enrolled in high school. These educational opportunities include dual credit/enrollment, Tech Prep, middle and early college high schools, and other programs serving disadvantaged youth (Lerner & Brand, 2006).

**Summary of aspirations and extracurricular activities.** Research results have been mixed on the impact of extracurricular activities and educational aspirations. Spady (1970) found participation in extracurricular activities, especially those related to leadership and service roles, impacted aspirations by encouraging social integration, improving self-esteem, and providing
skills and resources necessary for success in education. Alfeld et al. (2007) found similar results by participation in CTSOs in their pre-phase study. They found the impact of participation in leadership and professional development activities of CTSOs (Career and Technical Student Organizations) raised student aspirations. Hamrick and Stage (1998) found variations in the impact of extracurricular activities when data was analyzed in aggregate and disaggregated by race. Participation in extracurricular activities was no longer significant to aspirations when data was disaggregated by race.

**Credit-based Transition Programs**

Educational opportunities including credit-based transition programs are in the forefront of research today. Lerner and Brand (2006) conducted a systematic review of a number of previous studies, including reviewing outcomes (e.g., high school graduation, college going) associated with a number of secondary-postsecondary learning options (educational opportunities). Their review of 22 studies concluded positive outcomes for students who participate in various secondary-postsecondary learning option programs with regard to performance in high school, earning college credit while in high school, and better grades in college. Many of the studies did not allow for the disaggregation of data based on race/ethnicity, income level or other individual characteristics because the samples were too small. Other limitations (e.g., self-reported data is limited, lack of integration between secondary and postsecondary data systems, lack of access to detail data) have contributed to the lack of detailed research on secondary-postsecondary learning option programs. Lerner and Brand identified that the value of various educational opportunities is in their helping students to complete high school, to access more rigorous academic curricula, and to encourage students to think about
college. Referring to students participating in programs like dual credit and Tech Prep, they suggested “being on a college campus or accessing college-level course work may help them imagine a different and more positive future” (p. 129).

Programs such as Tech Prep and dual credit have existed for many years (Bragg, 2002; Hoffman, 2007). Tech Prep ("Carl D. Perkins Career and Technical Education Improvement Act," 2006) is a federally funded program that combines 2 years of secondary and a minimum of 2 years of postsecondary education integrated with academic and technical course work using work-based and work site learning opportunities. Tech Prep prepares students in a career field including high skill, high wage, or high demand occupations through applied, contextual, and integrated instruction. A key component to Tech Prep is the link between secondary schools and a 2-year postsecondary institution and if possible and practical, 4-year postsecondary institutions. The focus of integrating academic and technical curriculum and the development of articulation agreements with local community colleges, as stated in Public Law 109-270 Carl D. Perkins Vocation and Applied Technology Education Amendments of 2006, is providing a sequence of courses to develop basic skills, technical core competencies, and development in the specialty fields. Tech Prep basic skills development can begin as early as the ninth grade and the student can continue on the plan of study to completion of an associate’s degree or beyond.

The most current version of the Carl D. Perkins Career and Technical Education Improvement Act of 2006, Public Law 109-270, addresses the requirement of each State to implement programs of study in their state plans. The specific requirements for CTE programs of study must be adopted by local educational agencies and postsecondary institutions, and must include the following:

1. Incorporate secondary education and postsecondary education elements;
2. Include coherent and rigorous content aligned with challenging academic standards and relevant career and technical content in a coordinated, non-duplicative progression of courses that align secondary education with postsecondary education to adequately prepare students to succeed in postsecondary education;

3. May include the opportunity for secondary education students to participate in dual or concurrent enrollment programs or other ways to acquire postsecondary education credits; and

4. Lead to an industry-recognized credential or certificate at the postsecondary level, or an associate or baccalaureate degree; (p. 35)

The focus of CTE programs of study includes the incorporation of dual credit or other ways for students to obtain postsecondary education credits. This requirement provides opportunities for more students to obtain postsecondary credits and may ultimately increase participation in this program across the country.

The question arises about the influence of both Tech Prep and dual credit on the college aspirations of high school students. Tech Prep and dual credit include the following opportunities: (a) providing a challenging academic learning environment for students, (b) exposing students to higher academic levels of course work, and (c) providing college level course work (Bailey & Karp, 2003). Participation in extracurricular activities, such as athletics and student organizations is shown to have a positive impact on aspirations (Swail, 2000), but what about the participation in other types of educational activities, especially those activities with an academic focus? Research shows enrolling in rigorous course work (Adelman, 1999, 2006) and securing college qualifications (Adelman, 1999, 2006) contribute to student success in high school as well as college, but few studies have been done examining this important question for Tech Prep or dual credit. How does participation in these educational activities influence educational aspirations?
Dual credit initiatives have attracted a tremendous amount of attention during this past decade (Bailey, 2005). Initially dual credit course work represented an opportunity shared only with those students possessing higher academic abilities (Karp et al., 2004; National Commission on the High School Senior Year, 2001). But recently, dual credit opportunities have been associated with CTE courses that are available to students with varying degrees of academic ability (Bailey & Karp, 2003).

Credit-based transition programs: dual credit. Considering the importance of continuing into postsecondary education and noting nearly one-third of all students in undergraduate postsecondary education are in postsecondary vocational programs (Silverberg, Warner, Fong, & Goodwin, 2004), transition from high school to postsecondary education for CTE students is important. Nearly 37.6% of postsecondary vocational students under the age of 20 attend postsecondary education with the intent of transferring and 20.5% have the intent of obtaining a degree or certificate (Silverberg et al., 2004). Hershey, Silverberg, Owens, and Hulsey (1998) reported on the national evaluation of Tech Prep implementation using data from surveys, site-visits, and in-depth reviews from 1993 through 1997. Hershey et al. reported 58% of Tech Prep participants started some kind of postsecondary education or training with nearly a third of Tech Prep high school graduates attending a community college.

Though their study did not focus on CTE enrollment specifically, Venezia, Kirst, and Antonio (2003) noted that postsecondary success is dependent on a clear understanding of the expectations of college, and they observed dual credit courses can provide students with high school experiences that prepare them for college expectations.

With the implementation of educational programs like Tech Prep and dual credit, that primarily impact the junior or senior years of high school (Boswell, 2001; Clark, 2001), is it still
possible to change students’ college aspirations? Hossler, Braxton, and Coopersmith (1989) report “most high school students have made their decisions regarding postsecondary education by their freshman or sophomore year in high school” (p. 256). However, Alexander and Cook (1979) suggest educational plans are malleable. Using two sets of data, NLS: 72/74 and ETS data set (subset of the Study of Academic Prediction and Growth, 1968-69), they show for most students educational plans are longstanding (prior to the 10th grade) but in both data sets between 20-24% of students made their decision in the 12th grade.

Building bridges to college through various mechanisms is being addressed by state education leaders (Hoffman, Vargas, & Santos, May 2008). Dual credit programs have historically provided accelerated work for advanced students, including students in CTE programs (Hoffman et al., May 2008; Karp, Calcagno, Hughes, Jeong, & Bailey, 2007). As Hoffman et al. suggest, when properly designed, dual credit can do more than advance students; dual credit can serve as an on-ramp to college. As noted by Hoffman et al. the purpose of dual credit should be clearly defined. Dual credit programs can be bridges for students not already planning on college or can be considered as a head start strategy for those already committed to postsecondary education.

Waits, Setzer, and Lewis (2005) estimated there were nearly 1.2 million enrollments in courses for dual credit through postsecondary institutions in 2002-2003. Nearly three quarters of public high schools offered dual credit and within the 11,400 public schools, 92% offered academic courses and 51% offered technical courses. Waits et al. noted a positive relationship between school enrollment size and the number of CTE dual credit courses that were offered. The larger the school enrollment, the more likely the school is to offer CTE dual credit courses. Nationally, there were 398,000 enrollments in CTE dual credit courses in 2002-2003.
Waits et al. (2005) noted the students who may be able to benefit most from dual credit programs are currently participating the least. These underrepresented students, students in high minority serving high schools, are least likely to have access to dual credit or exam-based courses. Hoffman, Vargas, and Santos (May 2008) noted:

Dual enrollment programs have the potential to result in substantial benefits for high school students and their families, particularly for those who may not appear college bound. . . .Faced with higher expectations of college-level courses and with appropriate academic supports, many rise to the challenge, proving to themselves and others that they are indeed capable of postsecondary work. (p. 7)

In the Postsecondary Education Quick Information System (PEQIS) survey of 2002-2003, Kleiner and Lewis (2005) found 98% of public 2-year institutions, 77% of public 4-year institutions, 40% of private 4-year institutions, and 17% of private 2-year institutions participated in high school dual credit programs. Nearly 48% of the institutions responded that dual credit students generally took one course per semester, 19% responded two courses per academic term, 4% stated three or more courses per academic term, and 28% stated the number varied. Ninety-four percent of institutions awarded college credit for courses immediately following course completion. Kleiner and Lewis identified approximately 5% of postsecondary institutions with dual credit programs had programs specifically geared toward high school students at risk of education failure. Thirty-nine percent of institutions serving at risk students reported the primary focus of the program was CTE. Twenty-one percent of the programs were combined academic and CTE, 34% were academically focused only, and 6% were identified as other.

Results from the 2005 NAEP High School Transcript Study from high school graduates show 59% of students expecting to graduate from college take mid-level to rigorous curriculum in their high school years, while 50% of students who do not expect to graduate from college take a less than standard level of curriculum during their high school years (Shettle et al., 2007).
Standard level of curriculum is defined as at least four credits of English and three each in social studies, mathematics, and science. Mid-level curriculum is defined as the standard level of curriculum plus geometry and algebra I or II; at least two courses in biology, chemistry, and physics; and at least one credit of a foreign language. A rigorous curriculum is defined as mid-level curriculum plus an additional credit in mathematics including pre-calculus or higher; biology, chemistry, and physics; and at least three foreign language credits (Shettle et al., 2007).

The High School Transcript Study (HSTS) collected and analyzed transcripts from a representative sample of America’s public and private high school graduates. The study also reported the gap between whites and African Americans taking mid-level or higher curriculum diminished over the previous five years, however the discrepancies between the Hispanic population and whites remained the same.

A high school’s culture of preparation can make a difference in students’ access to college (De La Rosa & Tierney, 2006). De La Rosa and Tierney noted high schools can contribute to the college-going culture by:

- implementing academic preparation for college that encourages the pursuit of intensive academic goals with expectation for all students;
- have clear ongoing relationships with community colleges and four-year institutions so that students graduate with college credit;
- encourage elective teachers to file [document] to make their courses meet college requirements; and
- have a complete array of Advanced Placement courses. (p. 6)

Lynch, Harnish, Fletcher, Thornton and Thompson (2006) looked at students participating in CTE dual credit courses and their continued education in postsecondary institutions for a period of three years between July 1, 2001 and June 30, 2004 in the state of Georgia. Many of the collaborations between the high school and the technical colleges were
done through the effort of the Tech Prep program. The report showed 27% of high school students participating in CTE dual enrollment courses enrolled in a state technical college after high school graduation compared to the average transition rate of 8% of all high school graduates during the same time frame. Many of the students who transitioned to postsecondary technical schools attended the institution with which their high school partnered. According to Lynch et al. (2006), 91% of high school CTE course dual enrolled students earned an A, B, or C in their course work and after transitioning, 81% continued earning an A, B, or C on all college-level courses, including general education and technical education. Other impacts of participation in CTE dual enrollment as identified by survey participants include seeing connections between education and careers, improved self confidence in their ability to complete college work, and positive attitudes towards further education.

**Credit-based transition programs: CTE and tech prep.** Rojewski (1997) studied high school senior students using the NELS: 88/94 data set to examine participation in secondary vocational education, work experiences, and the postsecondary aspirations of economically disadvantaged and non-disadvantaged students. Rojewski used a two-stage stratified sample with schools as the first-stage unit and a random sample of students within each selected school as the second-stage unit. The resulting sample included senior students in 1992 that had responses for all data elements on questions related to work, participation in vocational education courses, and educational aspirations, yielding a sample of 2,289 adolescents who were economically disadvantaged and 9,720 considered non-disadvantaged.

Rojewski (1997) found more than double the percentage of disadvantaged youth participating in vocational courses and enrolled in the vocational program compared to non-disadvantaged youth. Rojewski found adolescents in the vocational program reported lower
educational aspirations than their non-program counterparts regardless of disadvantage status. Rojewski found disadvantaged youth with little or no vocational course work had lower educational aspirations than the non-disadvantaged youth, especially for youth without any prior involvement in vocational education. He also found disadvantaged youth in a vocational program had higher educational aspirations for a vocational/technical school (up to 2-year postsecondary degree) and lower educational aspirations for a college degree than non-disadvantaged youth. But as Rojewski noted, his data was not reflective of the new integrated academic-vocational curriculum as identified through subsequent changes to the Carl D. Perkins Vocational and Applied Technology Education Act, and future studies may show different results on educational aspirations.

Bailey and Karp (2003) completed a descriptive study of various credit-based transition programs including dual enrollment, Advanced Placement (AP), International Baccalaureate (IB), Tech Prep, and middle college high schools (MCHS) focusing on literature published from 1990 to 2003 as well as interviews with state and college level personnel, researchers and representatives of associations (e.g., Syracuse University Project Advance, the National Alliance of Concurrent Enrollment Programs, the College Board, and the International Baccalaureate Organization). They examined program components; student composition of enrollees (high achieving, college bound, or lower achieving), size and growth of the various credit-based transition programs; the intensity of the experience for students; and program effectiveness. Bailey and Karp categorized various credit-based transition programs into three program types: (a) singleton programs, (b) comprehensive programs, and (c) enhanced comprehensive programs. Singleton programs are most like Advanced Placement (AP) programs and serve high achieving students. Comprehensive programs are most like Tech Prep programs and serve middle
achieving students and enhanced comprehensive programs are similar to Middle College High School programs and serve middle to low achieving students.

Bailey and Karp (2003) found credit-based transition programs serve middle to low achieving students by: (a) preparing students for the academic rigors of college, (b) providing realistic information to students about the skills required to be successful in college, and (c) improving students’ motivation through interesting courses, high expectations, and promoting institutional relationship between secondary and postsecondary education. They found 21 of 45 published studies on credit-based transition programs discussed program outcomes but many did not consider confounding variables such as student characteristics, achievement, and motivation. Their review of prior studies led to the conclusion that credit-based transition programs had positive outcomes but most were limited by the lack of controls for student characteristics.

Many Tech Prep programs are considered comprehensive programs (Hershey et al., 1998). Tech Prep programs focus on integrated academic preparation along with technical preparation through career programs of study. Programs of study are generally defined as coordinated, successive course work and are not limited to single course occurrences. Tech Prep programs have multiple outcomes related to both education and work.

DeLuca, Plank, and Estacion (2006) used the National Longitudinal Survey of Youth 1997 (NLSY 97) and its subsequent rounds of surveys to identify whether participation in CTE during high school is related to postsecondary enrollment and whether the first college attended was a 2-year or 4-year institution. The student sample included 1,691 participants. DeLuca et al. categorized the career related programs and activities of students into four categories. These categories included: (a) career majors, (b) Tech Prep, (c) cooperative education, and (d) work-based learning activities. Control variables included gender, race/ethnicity, parents’ education,
SES, school type, and family structure. They found 58.1% of the students participated in at least one career related or CTE program, with 30% participating across multiple years. CTE participation differed with race/ethnicity. CTE participation included 61.6% of African Americans, 50.8% of Hispanics, and 59.1% of whites. They also found lowest income quartile students participated in the lowest rate of 52.3% while the second lowest income quartile participated in the high rate of 61.6%. Transcript data for 873 participants revealed lower income students took more CTE courses relative to academic courses whereas the highest income students took fewer CTE courses relative to academic courses.

DeLuca et al. (2006) found Tech Prep programs had no significant effect on college enrollment (2-year or 4-year) for CTE participants when controlling for gender, race, family background, grades, school engagement, and test scores. Using transcript analysis, they looked at CTE course taking (number of courses taken) as opposed to student reported participation in CTE programs or activities, and DeLuca et al. found that those students with high CTE-to-academic course ratios (0.6-3.0) had reduced chances of attending college as compared to students taking a smaller ratio of CTE courses controlling for gender, race, family background, grades, school engagement, and test scores. They also found differences in the types of institutions CTE students attend. Deluca et al found “students taking more than half of their courses in CTE have a 67% lower odds of attending a 2-year schools and 83% lower odds of attending a 4-year colleges than peers who had taken more academic courses” (p. 29).

In the first phase of a longitudinal, comprehensive multi-method study of dual enrolled students, Harnish and Lynch (2005) looked at factors related to the students’ transition into postsecondary education and work. The first phase involved a qualitative cross case analysis involving a purposeful sampling of three sites in the State of Georgia. Each site consisted of a
technical college and two high schools associated with the technical college. The sites
represented different models of delivery of CTE dual credit and varying curricula and program
areas. Site A served a metropolitan area and included a separate educational center to serve dual
credit students with a variety of CTE programs. Site B served a rural area with small school
enrollments, high poverty, and low educational attainment. Dual credit courses for Site B were
offered at the high school and at a satellite campus of the technical college. Site C served a
growing urban/suburban area with a large minority population. All dual credit classes in Site C
were offered at the high school. Data for the first phase of analysis was collected through field
data collection, interviews, and focus group discussions. One area of focus for this study by
Harnish and Lynch was participation in dual enrollment by student characteristics, motivation,
and admission requirements. They also studied outcomes associated with participation and
reasons why students enrolled in CTE dual credit.

Harnish and Lynch found students were enrolled in dual credit to obtain college credit
and to increase their wage earning potential, both during and after college. Outcomes associated
with dual credit programs were increased exposure to college, increased options for course work,
and focused career choices. Administrators noted the exposure to college course work helped
students understand the academic expectations as well as behavioral expectations of college.
Stakeholders in dual credit suggested enrollment in CTE dual credit courses helped students with
career decision making, employment skill development, and facilitating the transfer from
secondary education to postsecondary education. Harnish and Lynch found parents and
counselors were not factors in the decision to enroll in dual credit courses, but peers were
influential in the students’ decision to enroll in dual credit.
The final report of a four-phase study by Lynch, Harnish, Fletcher, Thornton, and Thompson (2006) began with phase one by Harnish and Lynch (2005) previously described. Phase two is an analysis of data on 17,442 high school students enrolled in dual credit and the 9,358 students who transitioned from high school to higher education in the State of Georgia in the defined time frame. These students also participated in dual credit with the local technical colleges during their high school years. Lynch et al. (2006) found 27% of all high school students participating in technical college dual credit during the three year time frame studied enrolled in a technical college following graduation, whereas the previous historical average transition rate of all high school graduates was 8%. Overall, 54% of high school dual credit students enrolled in the Georgia University System, whereas historically 46% of high school graduates matriculated to higher education.

Lynch et al. (2006) found students matriculating to the technical college were 55% female, 61% white, and 35% low-income students. These students were more likely to graduate from high school with a technical preparatory program. They also found students who matriculated to the 4-year institutions were similar in gender and race (56% female, 62% white) but represented a lower percentage (24%) of low-income students. These students more than likely completed a college preparatory program. Also of interest, Lynch et al. found males, especially African American males, enrolled in dual credit were least likely to continue in postsecondary education and African American females were most likely to enroll in technical colleges than any other gender and race combination (white, Hispanic, multi-racial, American Indian, Asian).

In looking at remediation of dual credit students, Lynch et al. (2006) found 25% of students entering the technical college and 26% of students entering the 4-year institutions
required at least one developmental studies course. Historically, one in two students entering a Georgia college required at least one developmental course. Lynch et al. also identified other positive impacts of dual credit and these included: (a) career development, (b) workforce preparation, and (c) drop-out prevention.

There are obviously many opportunities to expand research on credit-based transition programs but the difficulties arise in the complexity of the programs and the diversity of students involved in the programs. Sound methodological research is important in isolating variables that confound results and analyzing program outcomes using valid reliable measures. Further research in this area is definitely needed.

**Summary of credit-based transition programs.** Lerner and Brand (2007) concluded positive outcomes for students who participate in secondary-postsecondary learning option programs include better performance in high school, earning college credit while in high school, and better grades in college. A number of program options are available for high school students of varying abilities. These programs include academic curriculum and the integration of academic and technical curriculum. Some examples of programs include dual credit and Tech Prep programs. These programs can provide opportunities for students to understand the expectations of college and prepare students for college expectations (Venezia et al., 2003) and to build bridges in preparation for college (Hoffman et al., May 2008). Collaboration between the high schools and colleges is critical to easing the transition of students into postsecondary education and provides an educational path to meet the needs of the students.
Characteristics of Students in Credit-based Transition Programs

In academic year 2002-2003, nationally about 813,000 students (nearly 5% of all high school students in public and private institutions) earned college credit within or outside of dual enrollment programs. Of this number, nearly 84% of participating high school students earned college credit through dual credit programs, with the majority affiliated with public 2-year institutions (Kleiner & Lewis, 2005). Hoffman (2007) observed “the potential of dual enrollment to serve as a transition-to-college strategy for a wide range of students . . . dual enrollment can be a powerful tool for integrating high school and postsecondary education into a single system” (p. 194). Recent studies have shown mixed student educational outcomes associated with dual credit opportunities.

Bragg, Loeb, Gong, Deng, Yoo, and Hill (2002) conducted a four-year longitudinal study reviewing students’ educational outcomes and experiences. Their study included eight local Tech Prep consortia located in different regions of the country and involving nearly 4600 participants (nearly equally split between Tech Prep participants and non-participants). The dataset created for the study was called Community College and Beyond (CC&B). A random sample of Tech prep participants (300 per site) was identified. A random sample of non-participants was drawn to ensure groups were equivalent in high school GPA and/or high school percentile rank (HSPR). “Groups were similarly represented within the consortium by selecting an equivalent number of tech prep participants and non-participants by school and by graduating class” (Bragg et al., 2002, p. 40). Data analysis was performed on a consortium-by-consortium basis due to local differences in policy and approach.

Results showed Tech Prep participants in five consortia accumulated more articulated credits than non-participants, although both groups had articulated credit. These courses were
mostly CTE, with non-participant students in two consortia taking more academic (math and science) articulated courses than participants. A very high percentage (greater than 80%) of both participants and non-participants attended 2-year institutions. There were exceptions in this pattern in two consortia where both groups (participants and non-participants) and non-participants in another consortium attended 4-year institutions more frequently than 2-year institutions. A significant difference arose between the two groups in two consortia, with one consortium showing more participants attended 2-year colleges over non-participants and one consortium where non-participants attended 4-year institutions more than participants. The completion of any college credential within three to four years of high school graduation was not significantly different between participants and non-participants and was only about 10.5%.

Conducting a secondary analysis of the CC&B dataset, Kim (2006) studied the impact of dual credit, CTE dual credit, total dual credit, and articulated credit on college readiness and total college credit hours earned. She selected 1,141 high school graduates who enrolled in community colleges from four of the original eight consortia, and her analysis controlled for gender, high school percentile rank, and high school course-taking. She found students taking articulated credit earned more college credit hours than students taking academic or CTE dual credit among those students who matriculated to the lead community college. The lead community college refers to the community college responsible for providing college credit for the dual credit classes offered in high school. Kim noted students earning articulated credit were required to earn an additional 3 credit hours before articulated credit would be transcripted at the community college. She also found academic dual credit and articulated credit showed a positive relationship to college readiness, with academic dual credit related to math readiness and
articulated credit related to reading and writing readiness. Kim used placement in remedial courses to measure college readiness.

Lekes et al. (2007) studied the transition to college of CTE and non-CTE program students in a mixed methods approach using data from high school programs (CTE participants and non-participants) and data from community college students in two regions of the United States. The study was a two-part study focusing on a secondary education component and a postsecondary component. The purpose of the study was to examine transition activities and how transition activities affected students’ high school performance, transition to college, and postsecondary placement, persistence, and completion.

Secondary students involved in two programs (health and information technology (IT) programs) were studied along with non-participating counterparts. Both programs involved the opportunity for dual credit. Matched pair participants were created based on race/ethnicity, gender, age, GPA, and SES when available. The matched pair sampling yielded 68 CTE students and 68 non-CTE students who were seniors attending six high schools and a technical center (32 IT CTE students from the Northwest site and 36 health CTE students from the Southeast site). Findings revealed a statistically significant difference between CTE students and non-CTE students, and CTE students were more likely to participate in contextual learning, participate in internships, mentoring experiences, taking or planning to take industry certifications, and participate in dual credit. Specifically, CTE students (66.7%) were more likely to participate in at least one dual credit course compared to non-CTE students (30.2%). Lekes et al. found no significant differences between CTE students and non-CTE students in their academic ability and (a) overall high school GPA, (b) math GPA, and (c) science GPA. There was a significant difference in scores on the ACT WorkKeys Reading for Information sub-test given the spring
semester of the senior year, with CTE students performing significantly higher than non-CTE students.

Lekes et al. (2007) compared the plans and goals of CTE and non-CTE students, with CTE students scoring significantly higher on the following statements regarding goals and plans: (a) I have a plan for achieving my academic goals following high school, (b) I plan on continuing my studies in the (computer or health) field, and (c) I have a clear career goal. CTE students rated their skill development significantly higher than non-CTE students in the areas of problem solving, ability to complete projects, conduct research, math, applying to college, work-related skills, communication, time management, and thinking critically.

Lekes et al. (2007) administered a follow-up survey to the secondary participants six months after high school graduation to assess each students’ transition to college, and plans for college and career. CTE students (74.5%) were as likely as their non-CTE pair (76.6%) to enroll in college. They found educational aspirations were not significantly different between CTE and non-CTE students and CTE students (84.8%) were as likely to aspire to earning a bachelor’s degree or higher as non-CTE students (82.2%).

The postsecondary component of the Lekes et al. (2007) two-part study used two types of analysis. The primary analysis looked at students 18 years of age and older enrolled at the target community college between fall 2000 and spring 2004 who attended one of 25 feeder high schools. The number of participants in the group totaled 6,505. Control variables included age, gender, race/ethnicity, and SES. Students were identified as CTE (specifically Computer Information Systems (CIS)) dual credit participants, Running Start (RS) students, students who took at least one CIS course, and non-participants. Running Start is a dual credit program emphasizing academic courses. They looked at participation in postsecondary education and
college readiness. Lekes et al. (2007) found 33% of both CTE dual credit students and RS students entered postsecondary education at the community college. In studying remedial education requirements for the three groups, they found: (a) significant differences between RS students (39.5%) and non-participants (70.4%) in general remedial requirements (taking at least one remedial course) and math remediation (RS students and non-participants are 34.6% and 64.4% respectively), and (b) significant differences between both CTE dual credit (19.1%) and RS (7.4%), and non-participants (36.9%) in communication remediation. Lekes et al. note the requirements of the RS program include placement testing into college level courses and the results therefore represent this difference, at least in part. With control variables considered, CTE dual credit students were more academically prepared than non-participants in communication, but not in math or overall.

Lekes et al. (2007) provided a review of 78 responding participants from seven feeder high schools (including five of the high schools participating in the secondary component). These participants were asked to participate in a follow-up survey and provide high school transcripts along with the postsecondary information. Group comparisons (CTE dual credit, RS program, and non-participants) using high school transcripts showed: (a) no significant differences in high school GPAs; (b) CTE dual credit students averaged one level higher in math courses taken than non-participants while there were no differences between the groups in English, foreign language, or science; and (c) CTE dual credit students appeared to opt out of the college prep program but were about as well prepared as the other groups in the studied aspects of curriculum (English, foreign language, and science).

Karp, Calcagno, Hughes, Jeong, and Bailey (2007) studied two large existing student data sets representing Florida and New York City. Their quantitative longitudinal study controlled for
pre-existing student characteristics while analyzing college enrollment and persistence for high school students who were dual enrolled. Both studies evaluated the short-term outcomes (attending a two- or four-year institution; full-time enrollment; first-semester GPA; persistence to second semester; persistence to fourth semester) and long-term outcomes (total credits earned within three years).

In the state of Florida, Karp et al. (2007) analyzed the data twice, once for all students and once for CTE students as defined by NCES. They found in both sets of data (all students and only CTE students), a positive relationship between students participating in dual enrollment and high school graduation, enrollment in college, enrollment full time in college, and GPA one year after high school. In comparison participation in College Now, a dual enrollment program offered by City University of New York was positively related to pursuing a bachelor’s degree and overall progress toward a degree. They found students participating in College Now were 9.7% more likely to pursue a bachelor’s degree than their peers not enrolled in College Now, controlling for race, gender, SES, cohort year, age, and high school characteristics. This finding is interesting in that all College Now students are CTE students. The researchers did not directly measure educational aspirations but speculated that a relationship may exist between participation in College Now and students’ educational aspirations. Unlike Karp et al. (2007) analysis of students enrolled in dual enrollment courses in Florida, data collected on students in College Now revealed program intensity (number of dual enrollment courses taken) influenced first semester GPA and full-time enrollment. Program intensity was more important to long-term outcomes than short-term outcomes including persistence, GPA after four semesters, and progress toward a degree.
Karp et al. (2007) also looked at subgroups to identify the gains of dual enrollment by underrepresented groups. Analysis of subgroups based on gender, SES, and high school academic achievement was performed on the Florida study group. The New York study was limited in its number of participants and the only subgroup analyzed was gender. The results yielded no significant differences between males and females on short-term outcomes or long-term outcomes in the New York study. The Florida study was analyzed for all students and separately for CTE students. In both analyses, male participants were more likely than female participants to enroll in college, with high SES students more likely to enroll in four year institutions compared to low SES students. Karp et al. noted,

Males, low-income students, and low-achieving high school students all appear to benefit from participation in dual enrollment to a greater extent than their dual enrollment peers who enter college courses with more social, economic, and educational advantages. This indicates that dual enrollment may well be a strategy for encouraging postsecondary success among students not typically seen as college-bound. It also indicates that ... dual enrollment can benefit a range of students, not only those who achieve at very high levels in high school. (p. 63)

Controls used in the sub-group studies of Florida data included cohort year, English language proficiency, high school characteristics including location, income, and education level of residents.

Several limitations were mentioned by Karp et al. (2007), including limited measurement of previous academic ability of the students and individual measures of SES. Another shortcoming was the lack of availability of an important control variable, motivation. Despite these limitations these results are useful identifying characteristics of students and how participation might influence postsecondary outcomes.

Summary of characteristics of students in credit-based transition programs.
Nationally, nearly 5% of all high school students in both public and private institutions earned
college credit within or outside of dual credit programs (Kleiner & Lewis, 2005). Tech Prep participants accumulated more credits with this credit in mostly CTE courses compared to non-participants (Bragg et al., 2002). In looking at attendance in postsecondary institutions, results were mixed showing participants and non-participants attended 4-year institutions more frequently than 2-year institutions, and in other circumstances participants attended 2-year institutions over non-participants.

Kim (2006) found students participating in academic dual credit and articulated credit showed a positive relationship to college readiness. Readiness associated with math was found in students participating in academic dual credit and readiness associated with reading and writing was found in students with articulated credit. Lekes et al. (2007) studied CTE and non-CTE students and their high school experience and transition to college. They found no significant differences in academic ability, overall high school GPA and math and science GPA between the two groups. They also found CTE students were as likely as their non-CTE counterparts to enroll in college and had no significant differences in educational aspirations. Karp et al. (2007) found a positive relationship between students participating in dual credit and high school graduation, enrollment in college, enrollment full time in college, and GPA one year after high school.

**Summary**

This study used Hossler and Gallagher’s College Choice Model (1987) with a focus on the predisposition phase further studied by Hossler and Stage (1992). This simple three phase approach to the decision making process is student centered and is an integrated approach using common variables associated with status-attainment models, economic models, and social/cultural models. Directly focusing on aspiration development and using variables directly
impacting the early phase of college choice, the researcher will study the role of participation in dual credit on changing the educational aspirations of high school seniors. The conceptual framework for this study is presented in Figure 3.

Figure 3. Conceptual framework for this study.
Chapter 3

Methods

This chapter presents the research design, methods and procedures used to collect and analyze data on the change in aspirations during the senior year for students who participated in dual credit compared to students who did not. The chapter includes the following sections: (a) research design, (b) population and sample, (c) instrumentation, (d) data collection, (e) variables, and (f) methods for analyzing the data. The study employed a correlational research design that is explained in detail.

Research Design

This study used a correlational research design and included the collection of quantitative data using three questionnaires to collect data from high school students and dual credit course completion data collected from a local community college. Two questionnaires were administered during the students’ high school senior year and dual credit course completion data was collected from the local community college upon grade assignment for the college courses. The third and final questionnaire was administered post-high school graduation and will be used for follow-up analysis and not as part of this research project.

The researcher used correlational statistics to describe and measure the degree of association or relationship between two or more variables (Creswell, 2005). This study is considered observational since nothing is manipulated by the experimenter or individual leading the research. Correlational research is not causal research and therefore the researcher cannot make statements concerning cause and effect based on this type of research. Correlational
research is often exploratory and integral to beginning a research project, as it describes relationships between variables (Hulsizer & Woolf, 2009).

Some of the variables identified for this data collection were previously studied by Hossler and Stage (1992), Hossler and Gallagher (1987), and Hossler, Schmit, and Vesper (1999). They included academic performance, socioeconomic status (SES), family and peer influences, extracurricular activities, and educational aspirations. The researcher added the independent variable participation in dual credit, specifically participation in academic dual credit and CTE dual credit, to the model.

For this study, survey research was the method of data collection, specifically a group-administered questionnaire (Trochim, 2006). In group-administered questionnaires, a questionnaire is handed to each individual in the group and each individual is asked to complete the survey at that time. Considering the number of potential respondents, the most efficient manner of data collection was a paper survey instrument. The questionnaire was relatively inexpensive to administer and group-administration provided additional benefits. The ability to administer the questionnaire to a group in a classroom setting provided an organized assembly of respondents who had a group leader (teacher) available to answer any questions (Trochim, 2006).

**Population and Sample**

The sample for this study was drawn from the population of high school seniors attending one high school in the Midwest during the 2009-2010 academic year. The total population of high school seniors at the beginning of the 2009-2010 academic year was 530 senior students.
Permission to conduct research. Permission to conduct the research was obtained by the researcher calling the principal of the high school and scheduling a meeting with the principal in early summer 2009. The principal approved the research pending approval of the study from the Institutional Review Board (IRB) of the University of Illinois Urbana-Champaign (UIUC). The IRB process for the protection of human subjects was completed at the UIUC in August 2009. Approval of the study by the IRB process of the College of Education at UIUC was acquired prior to data collection.

Research site. The high school chosen for this study had a diverse population, and it offered students the opportunity to participate in both academic and CTE dual credit. The high school of choice (pseudonym is Midwest Area High School) was a large high school located in the Midwest with approximately 2,097 freshman to senior high school students. The diversity of the school is represented by enrollment that was 62% white, 36.0% Black, 0.6% Hispanic, and 1.2% other (Midwest Area Board of Education, 2010a). Approximately 48% of the students were eligible for reduced-price or free lunch programs (low income defined at or below 130% federal poverty level (Midwest Area Board of Education, 2010b)). The school had a mobility rate of 19.4% and a high school dropout rate of 3.9%. In the past academic year, Midwest Area High School offered 18 different types of academic dual credit courses (e.g., biology, English, public speaking, U.S. History) and 20 different types of CTE dual credit courses (e.g., basic welding, Microsoft Word®, child care, basic nursing assistant) with a local community college (pseudonym is Central Midwest Community College) (see Appendix A). Appendix A contains a listing of all academic and CTE dual credit courses available at Midwest Area High School. Courses are listed according to the opportunity for students to register during their junior and/or senior year in high school. Course curriculum is offered in a traditional format. There are a total
of 63 credit hours available in the academic dual credit offerings and 84 credit hours available in the CTE dual credit offerings. There are no fees associated with enrollment in dual credit courses. Academic requirements must be followed according to the college catalog. Most academic and CTE dual credit courses have minimum reading and/or sentence test score requirements students must meet prior to enrollment. Central Midwest Community College’s dual credit program is accredited by the National Alliance of Concurrent Enrollment Partnerships (NACEP). NACEP is a national accrediting body and organization that ensures dual credit programs demonstrate excellence and participate in research, and establishes communication and advocacy of dual credit programs (National Alliance of Concurrent Enrollment Partnerships, 2010).

There were two times during the students’ senior year that the researcher collected data. All students and their parents were mailed information regarding the research, risks, and options to withdraw. Upon completion of Instrument #1 and signing the consent forms, 284 senior students were considered participants in the research study. At the end of the students’ senior year, continuing students were identified and 227 students were asked to continue in the research project. After completion of Instrument#2 and signing of the revised consent, 163 students were considered participants in the research study. The sample was 31% of the senior class. Throughout the process students were removed from the research as a result of the following reasons: (a) parent withdrew their student from participation, (b) student failed to sign the first consent or complete the first questionnaire, (c) student did not continue their high school participation during the academic year, or (d) student did not complete the second questionnaire. Table 1 contains the numbers and percentages of the population and sample throughout the research process during the senior year.
The analysis between population and the research sample showed no significant differences in composition in gender \( \chi^2 (1, N = 163) = 0.027, p = .870 \) and in race/ethnicity \( \chi^2 (1, N = 163) = 2.137, p = .144 \) when analyzing with Chi-square goodness of fit tests. There was however, a significant difference in composition between the population and research sample in low income status \( \chi^2 (1, N = 163) = 13.275, p < .001 \). In order to compare the population and the research sample on low income status, the low income status of the research sample was defined based on the same measure as the population at 130% of federal poverty levels according to school guidelines (Midwest Area Board of Education, 2010a). Based on state reporting, the population had 48% of the students with low income status. Based on the data gathered by the researcher, the sample had 24% of the students with low income status. The significant difference in composition between the population and research sample with income status may possibly be due to a few factors: (a) population data was representative of the number of students in their freshman to senior year and sample data represented only senior year students, (b) the senior class was reduced throughout the academic year due to dropping out, moving, early graduation, or non-continuation in the research project which may have affected a larger number of low income students, (c) parent data submitted for reduced lunches was collected during August 2009 and salary data identified through the survey were representative of data obtained from third quarter of 2008 from the Department of Employment Security, and (d) differences in reporting income (population reports actual monthly income and sample was a annual salary estimate of income based on job title or description). There was no significant difference between participation groups from first questionnaire to second questionnaire using a Chi-square goodness of fit test \( \chi^2 (1, N = 163) = 1.342, p = .247 \). The intent of the researcher to provide a comparison between all groups was to show differences existed from the beginning.
and may reflect differences in reporting. It appears the differences in income status were evident from the first phase of the research when the sample was 54% of the population. The researcher would suggest that difference is due to inconsistencies between state reporting and the researcher’s method of collecting the data.

Table 1

*Numbers and Percentages of Population and Sample*

<table>
<thead>
<tr>
<th>Demographics</th>
<th>High School Senior Population</th>
<th>Participants – Following First Survey Questionnaire (Instrument #1)</th>
<th>Participants – Following Second Survey Questionnaire (Instrument #2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Number High School Seniors</td>
<td>530</td>
<td>284 (54%)</td>
<td>163 (31%)</td>
</tr>
<tr>
<td>Male</td>
<td>286 (54%)</td>
<td>145 (51%)</td>
<td>89 (55%)</td>
</tr>
<tr>
<td>Female</td>
<td>244 (46%)</td>
<td>139 (49%)</td>
<td>74 (45%)</td>
</tr>
<tr>
<td>White</td>
<td>345 (65%)</td>
<td>187 (66%)</td>
<td>115 (71%)</td>
</tr>
<tr>
<td>Non-white</td>
<td>185 (35%)</td>
<td>97 (34%)</td>
<td>48 (29%)</td>
</tr>
<tr>
<td>Low Income</td>
<td>48%(^a)</td>
<td>77 (28%)</td>
<td>39 (24%)</td>
</tr>
<tr>
<td>Other</td>
<td>52%</td>
<td>194 (72%)</td>
<td>124 (76%)</td>
</tr>
</tbody>
</table>

*Note. Number (%)*


**Student privacy.** All students were assigned a tracking number. This tracking number was used in place of personal identifying information (names and addresses) in the data entry process. The link between tracking number and personally identifiable information was stored.
separately in a secure location not in connection with the database, as specified by this researcher’s formal agreement with the College of Education’s Human Subjects Review office. This information was used only to match questionnaire responses for data entry, to identify non-responders to the surveys for follow-up, to match transcript data from the community college, and to identify individuals for the lottery associated with the study wherein each respondent’s identification number was included in a drawing for a gift certificate at the end of each data collection period, described in more detail below. This process was used to assure the study participants that participation in this study represented minimal risk to their privacy.

**Subject remuneration.** Using the process described above to protect human subjects, all students participating in the study had their ID entered into a drawing for a gift certificate after each of the questionnaires was administered. After Instrument #1 was completed, the students were entered into a drawing for a $50 gift certificate. Since Instrument #1 was administered at two different times (as explained in the data collection process), two $50 gift certificates were awarded. After Instrument #2 was completed, the students had an opportunity to win a $50 gift certificate and a $100 gift certificate. The students were entered into two drawings. The final drawing occurred at the end of the third data collection period (Instrument #3, which is not part of this research study) and students were entered into a drawing for a $250 gift certificate.

After completion of Instrument #1, the approximate odds of winning the drawing were 2:284. After the completion of Instrument #2, the approximate odds of winning each drawing were 1:163 for the $50 gift certificate and for the $100 gift certificate. After the completion of Instrument #3, the approximate odds of winning the drawing were 1:41. The odds were based on the number of seniors completing each of the questionnaires. The winners were notified by the school office following completion of Instrument #1 and Instrument #2. Following the
completion of Instrument #3 the winner was notified by email and the high school was notified as well as specified by this researcher’s formal agreement with the College of Education’s Human Subjects Review office.

**Instrumentation**

**Validity and reliability.** The variables of interest were defined through previously constructed survey questions used in national longitudinal research studies. Most questions were taken from existing instruments, and used verbatim or modified for clarity (see Appendix B). Many questions were taken from national surveys from the National Center for Education Statistics (NCES) (2002a, 2002b, 2002c). These questions have been used repeatedly over time since 2002, but since there might be differences in understanding across participants due to various external factors (e.g., age, geographic location, culture), it is important to ensure that respondents understand the questions on the survey instrument.

One mechanism to use for determining if questions are consistently understood and answered by respondents for a new administration of a questionnaire is to perform cognitive laboratory interviews (Fowler, 2009). Cognitive laboratory interviews are performed to collect information about respondents’ comprehension and responses to questions. According to Fowler (2009), the most common task of a cognitive lab is to ask respondents to identify in their own words what they believe the question is asking and to explain how they chose a particular answer over others. The intent of this process is to identify comprehension and difficulty of the response task prior to disseminating the questionnaire to all study participants. This pre-test laboratory interview usually involves fewer than ten participants. This process is an essential step in the design and evaluation of the survey instrument (Fowler, 2009). In an effort to ensure clarity and
understanding of the questions used on an instrument, a cognitive laboratory interview was conducted for this study.

Prior to survey administration the researcher conducted a cognitive laboratory interview with 11 high school senior students (6 males and 5 females). The students who were invited to participate in the cognitive lab signed a consent form, and their parents signed one as well. Participating students were also given a $10 gift certificate from Subway® for their time and efforts. Students completed the questionnaires and in conjunction with the researcher discussed items that lacked clarity for them. The students were able to verbally discuss their questions about the instrument, and/or write comments on their questionnaires. The survey instrument questions were taken from previous NCES surveys from the National Education Longitudinal Survey (NELS). This exercise ensured face validity of the questionnaire. Validity refers to the extent to which results of the instrument are meaningful, make sense relative to the concepts or constructs that the researcher seeks to understand, and enable the researcher to draw good conclusions (Creswell, 2005). The following questions were asked during the cognitive laboratory interview session:

1. Is the wording of the questions and the response alternatives appropriate?

2. If any of your friends were reading these questions, are there words or phrases that may confuse them?

3. Are the questions, response alternatives, and instructions clear?

4. Is there anything in any of the documents that is confusing or hard to understand?

5. Do you think that the questionnaire can be completed without looking up any information?

6. How long do you estimate that it would take a student to complete the questionnaire?
Comments from the students indicated clarity of questions and appropriateness of questions; however, the students commented on the inability to remember other family member addresses from memory. As a result, email addresses were added to the questionnaire. The second questionnaire (Instrument #2) requests contact information from students in order for the researcher to follow-up with students regarding college enrollment after high school. This follow-up research is not part of this study. Students were able to remember family member e-mails better than family residence addresses. All other questions on the instruments were clear.

Reliability refers to the stability and consistency of a measurement (Creswell, 2005). Most questions were taken from widely used national survey instruments and those questions represented a measure of a single variable. Family income was an index of the responses on at least two questions. Prior to national dissemination in 2002, Education Longitudinal Study (ELS) researchers tested their instruments. To ensure quality of responses, a field test study of the base year questionnaire (ELS 2002 study) was reviewed using 922 cases. One way to assess quality of questions is to field questions from respondents at the time of administration. This was done during the field test for the base year questionnaire (Owings, 2003). Review and analysis of field responses post-administration defined question refinement and informed instrument development as a result of the following: (a) questions from student participants regarding items on the questionnaire, (b) the percent of missing data retrieved for each critical item, (c) item-level rates of non-response, (d) a check on inter-item consistency, (e) percent of students successfully navigating each filter question, and (f) item-level response rate variation by position in the questionnaire (Owings, 2003). Field test studies during the first follow-up time frame evaluated a number of questionnaires, including the first follow-up questionnaire. The analysis included evaluation of item non-response, test-retest reliabilities, scale reliabilities, and correlations.
between theoretically related measures (Ingels, Pratt, Rogers, Siegel, & Stutts, 2005). This researcher’s study used questions defined as primarily informational. There were no quantitative values reported for informational questions contained in the national study.

**Data Collection**

A complete listing of the senior students and their home mailing addresses was provided by the high school to this researcher. Of the 530 students eligible to participate, 11 students had incorrect addresses and never received notification of the research (therefore the researcher assumed parent and student were not adequately informed and dropped the students from the study), and 21 students and/or parents opted out of the research study leaving a total of 498 students available to participate.

**Parent’s letter.** Following the identification of the population, a parents’ refusal for child to participate form (see Appendix C) was mailed to students’ home address and addressed to the parents/guardians approximately 3 weeks prior to the September 30, 2009 administration of Instrument #1. The form included the following information: (a) introduction of the researcher, (b) explanation of the research study, (c) how to contact researcher with questions or desire to withdraw student from study, (d) explanation of confidentiality and risk involved in participation, (e) general time frames of the research, (f) explanation of remuneration opportunities for participants, and (g) signature line for those parents who did not want their child to participate in the study. Parent forms had a requested return date and parents were asked to return the form to the high school main office. Parents/guardians were asked to sign the refusal to participate form if they did not want their child to participate in this study. Absence of the refusal form assumed parental approval for student participation.
**Student letter.** Students were also mailed an information letter (see Appendix D). The student letter provided the following information: (a) introduction of the researcher, (b) explanation of the research study, (c) explanation regarding the parental refusal form mailed to parents, (d) explanation of confidentiality and risk of research, (e) general time frames of the research, and (f) explanation of remuneration opportunities for participants.

**Additional communication.** An alternative form of communication (e.g., newsletter) was mailed to the parents sharing information about the research (see Appendix E) for a second time. The additional mailing to parents ensured the parents received information about the study. The information content received in the newsletter sent to parents was similar to the content in the original letter but was provided in a different format.

**Instrument #1 administration.** All senior English classes were identified for administration of the first questionnaire (Instrument #1) on September 30, 2009. With the help of the high school English chairperson, this researcher identified 20 English class sections to administer Instrument #1 (see Appendix F) and the student consent form (see Appendix G). The English chairperson arranged for all English faculty in the identified senior English courses to administer Instrument #1 during the scheduled class periods on September 30, 2009. A formal set of instructions (see Appendix H) was provided to each faculty to assist in consistent delivery of instructions. Instructions were written for the instructor, and specific instructions were written to be read to the students. Each English faculty was given a $10 gift certificate to Subway® for assistance in administering Instrument #1. Packets containing Instrument #1 and the student consent form were provided to all senior students.

After Instrument #1 and the student consent forms were completed the researcher identified all valid responses (those with signed consents) which totaled 245. The desire to
ensure adequate sampling of CTE participants and increase the sample size led to the decision to return to the school two weeks later (early October 2009) and administer Instrument #1 and student consents in CTE classes to those students who did not complete the survey in an English class. With the help of the assistant principal of CTE, this researcher identified 58 students who were enrolled in CTE classes and were not enrolled in senior English classes. The researcher went to 12 CTE class sections offering these students the opportunity to participate in the research study. As a result, an additional 39 respondents participated bringing the total to 284 (54%) high school senior participants.

The variables of interest for the research were collected during the senior year at two different times using two different questionnaires. The data collected on the first questionnaire included the following variables: (a) students’ initial senior-year aspirations, (b) gender, (c) race/ethnicity, (d) father/male guardian’s highest level of education, (e) mother/female guardian’s highest level of education, (f) father/male guardian’s current employment status, (g) father/male guardian’s occupation, (h) mother/female guardian’s current employment status, (i) mother/female guardian’s occupation, (j) father/male guardian’s educational expectation for the student, and (k) mother/female guardian’s educational expectation for the student. The data collected on the second questionnaire included the following variables: (a) students’ final senior-year aspirations, (b) participation in extracurricular activities, (c) overall GPA in four academic core courses, and (d) educational plans of the students’ friends. Additional contact information was collected to follow-up with students post high school graduation, and this researcher intends to use this information to address research questions beyond the scope of the current study.
Instrument #2 administration. In preparation for administration of the second questionnaire (Instrument #2) at the end of the school year (May 2010), rosters of all senior English classes and rosters from all CTE courses were provided to this researcher to locate seniors continuing into the spring semester. A listing of students (101 students) who had either dropped out of school (17%), participated in early graduation (69%), chose to continue in a General Educational Development (GED) program (6%) or who had transferred out of the district (8%) was provided to this researcher to help determine continuance in the study. A total of 57 students from the researcher’s sample were eliminated from the study due to their lack of persistence at Midwest Area High School. A total of 227 students were given Instrument #2 (see Appendix I) and a revised student consent form (see Appendix J). Only those students who completed Instrument #1 had the option of completing Instrument #2.

The decision was made by this researcher to eliminate obtaining ACT scores since an additional parent signature would be required by the high school to obtain this information and the additional requirement might have complicated the process and led to incomplete cases due to missing data. A question pertaining to self-reported GPA was used in its place. A signature of the student was required to obtain community college credit information. These changes were summarized on a revised student consent form and the students were asked to sign the revised consent form.

Because some of the students may fail to sign the revised consent, two additional questions were added to the survey instrument to obtain student-reported dual credit course completion data. This information would provide student-reported dual credit course completion data in place of the community college data that could not be obtained in the event the revised student consent was not signed by the student. Obtaining self-reported data would prevent
elimination of the student from the study. The students’ signature on the first consent covered completing Instrument #2 and if the students completed Instrument #2 but did not complete the revised consent, the data from Instrument #2 could still be used. There were 20 students who did not sign the revised consent form but remained in the study because they completed Instrument #2. In an effort to determine the reliability of self-reported dual credit data, the researcher performed correlational analysis on those students who had both self-reported data and community college reported data. The correlation between self-reported dual credit hours (both academic and CTE) earned during the junior year \((r = .509, p < .001)\) and community college reported dual credit hours was moderate. Total junior year dual credit was used as a control variable in the analysis. The correlation between self-reported senior-year academic dual credit and community college reported senior-year academic dual credit \((r = .832, p < .001)\) was strong. The correlation between self-reported senior-year CTE dual credit and community college reported senior-year CTE dual credit \((r = .651, p < .001)\) was moderate. Based on correlational analysis, using student self-reported data is moderately reliable. The researcher relied on self-reported data for 20 cases out of 163 cases (12%) for analysis.

Class rosters were created for the researcher and the 227 students continuing with the research project were grouped by class (22 English class sections and 21 CTE class sections). Packets were prepared with student names, class time and room number, and were distributed. Packets contained Instrument #2 and the revised consent form. This researcher went to the CTE classes to communicate with those students continuing with the research and the English faculty communicated with their students who were continuing. Administration of Instrument #2 was similar to Instrument #1. Again, a scripted communication sheet to ensure consistent information was being shared with all students (see Appendix K). The teachers received a $10 Subway® gift
certificate for their assistance in administering Instrument #2. After distribution of Instrument #2 in early May 2010, 163 students responded and were considered continuing participants in the research.

**Obtaining community college data.** This researcher provided documentation (formal request to Central Midwest Community College Institutional Review Board) and provided information to the community college for all students who signed the revised consent form to obtain the dual credit course completion data which resides on community college transcripts in the form of completed credit hours. The researcher received an electronic file from Central Midwest Community College containing the data [completed hours by Program Classification System (PCS) code by academic year by student] once dual credit grades were completed for the school year. PCS coding is a state-wide standardized system of assigning course codes and identifying course type in the community college system. The community college data was received in July 2010.

**Variables**

To answer the research questions addressed in Chapter 1 and to utilize the theoretical concepts of Hossler and Gallagher (1987), the variables of interest include gender, race/ethnicity, parents’ education, parents’ expectations, household income (SES), GPA, extracurricular activities, peer influence, students’ initial senior-year educational aspirations, students’ final senior-year educational aspirations, and participation in dual credit measured in the junior-year, which was used as a control variable, and participation in dual credit in the senior year of high school. The primary dependent variable is students’ final senior-year aspirations. Student aspiration is the end result of the predisposition phase of college choice (Hossler & Stage, 1992).
and predisposition is a major component in Hossler and Gallagher’s College Choice model (1987). The primary independent variable is participation in dual credit during the senior year. The researcher’s interest is to determine if dual credit participation has an impact on changing student aspirations from the beginning to the end of the senior year of high school while controlling for student characteristics, significant others’ influence, junior-year dual credit completed, and extracurricular activities. The details of how the demographic variables were operationalized are described in Table 2.

**Gender.** Each student was asked to identify their gender as either male or female. After the completion of the two questionnaires, all responses (163) were coded. The variable [male] was used as a dummy variable for analysis. Male was coded equal to 1, and female was coded equal to 0.

**Race/ethnicity.** The race/ethnicity variable was collected by having respondents self-report on the questionnaire using the following options: (a) white, (b) black or African American, (c) Hispanic or Latino, (d) multi-racial/multi-ethnic, (e) American Indian or Alaskan Native, (f) Asian or Pacific Islander, (g) other, or (h) do not wish to respond (coded as missing data). After the completion of the two questionnaires, all responses (163) were coded. The variable [white] was created as a dummy variable for analysis. White was coded equal to 1 and all remaining cases were coded equal to 0. There was no missing data for this variable.

Table 2

Demographic Variable Titles and Operationalization

<table>
<thead>
<tr>
<th>Variable Descriptions</th>
<th>How operationalized</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Gender (please check one):</td>
</tr>
<tr>
<td></td>
<td>1. Male</td>
</tr>
<tr>
<td></td>
<td>2. Female</td>
</tr>
</tbody>
</table>

(continued)
Table 2 (continued)

<table>
<thead>
<tr>
<th>Variable Descriptions</th>
<th>How operationalized</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Male] (Recoded)</td>
<td>Male = 1</td>
</tr>
<tr>
<td></td>
<td>Female = 0</td>
</tr>
<tr>
<td>Race/Ethnicity</td>
<td>Ethnicity (please check one):</td>
</tr>
<tr>
<td></td>
<td>1. American Indian or Alaskan Native</td>
</tr>
<tr>
<td></td>
<td>2. Asian or Pacific Islander</td>
</tr>
<tr>
<td></td>
<td>3. Black or African American</td>
</tr>
<tr>
<td></td>
<td>4. Hispanic or Latino</td>
</tr>
<tr>
<td>[white] (recoded)</td>
<td>5. Multi-racial/multi-ethnic</td>
</tr>
<tr>
<td></td>
<td>6. White, non-Hispanic</td>
</tr>
<tr>
<td></td>
<td>7. Other, please describe ____________________</td>
</tr>
<tr>
<td></td>
<td>8. Do not wish to respond</td>
</tr>
<tr>
<td></td>
<td>White = 1</td>
</tr>
<tr>
<td></td>
<td>Non-white = 0</td>
</tr>
</tbody>
</table>

**Parents’ education.** In this study, students were surveyed about the level of education that their mother/guardian and father/guardian had completed. The options were as follows: (a) did not finish high school, (b) graduated from high school or GED, (c) graduated high school and attended 2 year did not complete degree, (d) graduated from 2year school, (e) graduated from high school, went to college, did not complete 4 year degree, (f) graduated from 4 year college, (g) completed Master’s degree or equivalent, (h) completed Ph.D., M.D., or other advanced degree, (i) do not know, and (j) does not apply. The question was replicated from the Educational Longitudinal Study of 2002 (National Center for Education Statistics, 2002b). Responses equal to (i) do not know or (j) does not apply were coded as missing data.

To create the variable measuring parents’ education from mothers’ education and fathers’ education, the higher value of the two values was assigned. If either mothers’ or fathers’ values were missing, the only value available was used. The detailed information contained in the
parents’ education question included eight steps whereas other educational variables including students’ initial senior-year and final senior-year educational aspirations and parents’ expectations contained only seven steps. This variable was recoded by collapsing two response options (option 4 and 5 on the questionnaire) into a single value, thus creating the same 7-level scale as the other education related variables. Option 4 identifies those students who graduated from a two-year institution and option 5 identifies those students who attended college but did not complete a four-year degree. There were seven cases that were impacted by this recoding. This recoding will allow for easier comparison between education-related variables. The range of possible values was from 1 to 7. The details of how the parents’ education variables were operationalized and their sources are described in Table 3.

Table 3

Parents’ Education Variable Descriptions and Operationalization

<table>
<thead>
<tr>
<th>Variable Descriptions</th>
<th>How operationalized</th>
</tr>
</thead>
<tbody>
<tr>
<td>How far in school did your parents/guardians go? Highest level of education reached by father/male guardian: (please check one)</td>
<td></td>
</tr>
<tr>
<td>1. Did not finish High School</td>
<td></td>
</tr>
<tr>
<td>2. Graduated from High School or GED Program</td>
<td></td>
</tr>
<tr>
<td>3. Graduated from high school and attended a two-year school (such as a vocational or technical school, a junior college, or a community college), but did not complete a degree</td>
<td></td>
</tr>
<tr>
<td>4. Graduated from a two-year school (such as a vocational or technical school, junior college, or a community college)</td>
<td></td>
</tr>
<tr>
<td>5. Graduated from high school and went to college, but did not complete a four-year degree</td>
<td></td>
</tr>
<tr>
<td>6. Graduated from four-year college</td>
<td></td>
</tr>
<tr>
<td>7. Completed Master’s Degree or equivalent</td>
<td></td>
</tr>
<tr>
<td>8. Completed Ph.D., M.D. or other advanced degree</td>
<td></td>
</tr>
<tr>
<td>9. Do not Know</td>
<td></td>
</tr>
</tbody>
</table>

(continued)
Table 3 (continued)

<table>
<thead>
<tr>
<th>Variable Descriptions</th>
<th>How operationalized</th>
</tr>
</thead>
<tbody>
<tr>
<td>10. Does not apply</td>
<td></td>
</tr>
<tr>
<td>Highest level of education reached by mother/female guardian: (please check one)</td>
<td></td>
</tr>
<tr>
<td>1. Did not finish High School</td>
<td></td>
</tr>
<tr>
<td>2. Graduated from High School or GED Program</td>
<td></td>
</tr>
<tr>
<td>3. Graduated from high school and attended a two-year school (such as a vocational or technical school, a junior college, or a community college), but did not complete a degree</td>
<td></td>
</tr>
<tr>
<td>4. Graduated from a two-year school (such as a vocational or technical school, junior college, or a community college)</td>
<td></td>
</tr>
<tr>
<td>5. Graduated from high school and went to college, but did not complete a four-year degree</td>
<td></td>
</tr>
<tr>
<td>6. Graduated from four-year college</td>
<td></td>
</tr>
<tr>
<td>7. Completed Master’s Degree or equivalent</td>
<td></td>
</tr>
<tr>
<td>8. Completed Ph.D., M.D. or other advanced degree</td>
<td></td>
</tr>
<tr>
<td>9. Do not Know</td>
<td></td>
</tr>
<tr>
<td>10. Does not apply</td>
<td></td>
</tr>
</tbody>
</table>

Parents’ Education

Parents’ education will be the higher value between the mothers’ and the fathers’ education


**Parents’ expectations.** This study surveyed students about the level of education they thought their mother and father wanted them to attain. The question was replicated from the Educational Longitudinal Study of 2002 (National Center for Education Statistics, 2002a). The options included: (a) complete less than high school graduation, (b) graduate from high school or obtain GED, (c) attend vocational, trade, or business school after high school, (d) receive Associate’s degree (2 years), (e) receive Bachelor’s degree (4 years), (f) obtain a Master’s degree or equivalent, or (g) obtain a Ph.D., M.D., or other advanced degree. To create the variable parents’ expectations from mothers’ expectations and fathers’ expectations, the highest value
between the two responses was assigned. If either mothers’ or fathers’ values were missing the only value available was used. If both mothers’ and fathers’ values were missing the variable was coded as missing data. The range of possible values was from 1 to 7. The details of how the parents’ expectation variable was operationalized and its source are described in Table 4.

Table 4

*Parents’ Expectations Variable Descriptions and Operationalization*

<table>
<thead>
<tr>
<th>Variable Descriptions</th>
<th>How operationalized</th>
</tr>
</thead>
<tbody>
<tr>
<td>Father’s Expectations</td>
<td>How far in school do you think your parents/guardians want you to go?</td>
</tr>
<tr>
<td></td>
<td>Father or male guardian wants me to: (please check one)</td>
</tr>
<tr>
<td></td>
<td>1. Complete less than high school graduation</td>
</tr>
<tr>
<td></td>
<td>2. Graduate from high school or obtain GED</td>
</tr>
<tr>
<td></td>
<td>3. Attend vocational, trade, or business school after high school (1-2 years) or attend one or two years of college</td>
</tr>
<tr>
<td></td>
<td>4. Receive Associate’s degree (2 years)</td>
</tr>
<tr>
<td></td>
<td>5. Receive Bachelor’s degree (4 years)</td>
</tr>
<tr>
<td></td>
<td>6. Obtain a Master’s degree or equivalent</td>
</tr>
<tr>
<td></td>
<td>7. Obtain a Ph.D., M.D., or other advanced degree</td>
</tr>
<tr>
<td>Mother’s Expectations</td>
<td>Mother or female guardian wants me to: (please check one)</td>
</tr>
<tr>
<td></td>
<td>1. Complete less than high school graduation</td>
</tr>
<tr>
<td></td>
<td>2. Graduate from high school or obtain GED</td>
</tr>
<tr>
<td></td>
<td>3. Attend vocational, trade, or business school after high school (1-2 years) or attend one or two years of college</td>
</tr>
<tr>
<td></td>
<td>4. Receive Associate’s degree (2 years)</td>
</tr>
<tr>
<td></td>
<td>5. Receive Bachelor’s degree (4 years)</td>
</tr>
<tr>
<td></td>
<td>6. Obtain a Master’s degree or equivalent</td>
</tr>
<tr>
<td></td>
<td>7. Obtain a Ph.D., M.D., or other advanced degree</td>
</tr>
<tr>
<td>Parent’s Expectations</td>
<td>For purposes of analysis, parents’ expectations will be the higher value between the mother’s expectation and father’s expectation.</td>
</tr>
</tbody>
</table>

**SES - household income.** The variable household income is the total household income. The variable is an index of income based on employment status, occupation, and geographical region of employment that was conceived and operationalized by this researcher. The question on the instrument was replicated from the Educational Longitudinal Study of 2002 (National Center for Education Statistics, 2002b). The income value for the male and female adults in the household was based on the occupation and the employment status with the following options: (a) unemployed, (b) employed less than 20 hrs per week, (c) employed 20 or more hrs per week, (d) retired, (e) disabled, or (f) does not apply. Based on employment status and occupation provided by survey data, the annual median salary for each person was identified based on regional values provided by the State Department of Employment Security (Midwest Area Department of Employment Security, 2010). The following website (http://www.workforceinfo.state.xx.us/) was used to access regional annual median salaries (Midwest Area Department of Employment Security, 2010). Salary data provided by the State Department of Employment Security were from 2008 Quarter 3. Questionnaire results regarding occupation information (job title and/or job duties) was used to identify the occupation. Selecting the occupation then led to detailed information regarding various levels of salaries (e.g., entry level, median, experienced). The opportunity to select salaries by region was available and this researcher selected the appropriate region and used the value representing median annual salaries for each occupation. If the self-reported employment status of either one or both parents was unemployed, retired, disabled, or does not apply, the annual income was coded as zero income. If the self-reported employment status was left blank then data was coded as missing data. Coding for missing data or responses marked as “does not apply” may be indicative of single head of household families. If only one of the parents reported occupation and employment status then
the single derived income became the household income. In some instances job titles and duties may not provide enough detail to identify the appropriate salary. For example, an individual working in a medical laboratory could potentially have two different positions depending on their level of education. In some instances it was necessary to use level of education to identify the appropriate salary.

If the employment status was part-time for either of the parents (employed less than 20 hrs per week), the annual median income for that individual was divided by 2 to represent part-time employment. Four cases for the male head of household were missing occupation information but the survey response indicated that the father’s employment status was full-time, so the average income for males employed 20 or more hrs per week (equal to $44,784) was used for these four cases. The value for household income was calculated based on the sum of mother’s and father’s income. If either parent’s salary information could not be determined based on questionnaire responses, the salary was coded as missing data. It is important to remember this variable represents a value identified in September 2009 but used data reported from third quarter 2008.

Descriptive analysis and regression analysis was performed using household income and the recoded variable, low income status. The criterion for low income status is defined by the following guidelines. The State report on poverty for 2009 (Heartland Alliance for Human Needs and Human Rights, 2010) identified low income for a family of four based on federal poverty levels at $44,100. Family income equal to $44,100 and below was coded as 1 (low income) and higher incomes were coded 0 (other). The detail of how the household income variable was operationalized and its source is described in Table 5.
Table 5

*Occupation, Employment Status, and Household Income Variables and Operationalization*

<table>
<thead>
<tr>
<th>Variable Descriptions</th>
<th>How operationalized</th>
</tr>
</thead>
<tbody>
<tr>
<td>Father’s/male guardian’s and Mother’s/female guardian’s Employment Status and Father’s/Mother’s Occupation</td>
<td>Father’s/male guardian’s current employment: (please check one)</td>
</tr>
<tr>
<td></td>
<td>1. unemployed</td>
</tr>
<tr>
<td></td>
<td>2. employed less than 20 hrs per week (total)</td>
</tr>
<tr>
<td></td>
<td>3. employed 20 or more hrs per week (total)</td>
</tr>
<tr>
<td></td>
<td>4. retired</td>
</tr>
<tr>
<td></td>
<td>5. disabled</td>
</tr>
<tr>
<td></td>
<td>6. does not apply</td>
</tr>
<tr>
<td></td>
<td>What kind of work does your father normally do? That is, what is the job called?</td>
</tr>
<tr>
<td></td>
<td>What does he actually do in that job? That is, what are his main duties?</td>
</tr>
<tr>
<td>Mother’s/female guardian’s current employment: (please check one)</td>
<td>1. unemployed</td>
</tr>
<tr>
<td></td>
<td>2. employed less than 20 hrs per week (total)</td>
</tr>
<tr>
<td></td>
<td>3. employed 20 or more hrs per week (total)</td>
</tr>
<tr>
<td></td>
<td>4. retired</td>
</tr>
<tr>
<td></td>
<td>5. disabled</td>
</tr>
<tr>
<td></td>
<td>6. does not apply</td>
</tr>
<tr>
<td></td>
<td>What kind of work does your mother normally do? That is, what is the job called?</td>
</tr>
<tr>
<td></td>
<td>What does he/she actually do in that job? That is, what are his/her main duties?</td>
</tr>
<tr>
<td>Derived from occupation and pulled from Central Midwest Department of Employment securities website based on geographic location</td>
<td></td>
</tr>
</tbody>
</table>

(continued)
Variable Descriptions | How operationalized
--- | ---
**Household Income** | Calculated (Combined Father’s and Mother’s Income)
Using parents’ occupation, employment status and regional salary information from the Central Midwest Department of Employment Security, annual median salaries for each parent will be identified. The combined salaries, if applicable, will be household income.

[Low income] (recoded) | Low income = 1
Other = 0


**Grade Point Average.** Through the survey the students were asked to assess their average grades from ninth grade to twelfth grade (mostly As, half As and half Bs, mostly Bs, half Bs and half Cs, mostly Cs, half Cs and half Ds, mostly Ds, mostly below Ds) in four core subject areas (math, science, English, social science/history). The average grade of each subject was assigned a corresponding point value where mostly As was equivalent to 4.0, As and Bs were equivalent to 3.5, mostly Bs was equivalent to 3.0, Bs and Cs were equivalent to 2.5, mostly Cs was equivalent to 2.0, Cs and Ds were equivalent to 1.5, mostly Ds was equivalent to 1.0, and mostly below Ds was equivalent to 0.5. The four subject areas were averaged to compute an overall GPA for the student. The question was modified from the Survey of High School Students used by Alfeld et al. (2006). Responses were either complete (all four subject areas provided) or missing (3 cases provided no responses for subject areas). If the value was missing, the variable was coded as missing data. The range of possible values was from 0.5 to 4.0. The details of how the GPA variable was operationalized are described in Table 6.
Table 6

Grade Point Average (GPA) Variable and Operationalization

<table>
<thead>
<tr>
<th>Variable Descriptions</th>
<th>How operationalized</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students’ Academic Performance operationalized through GPA</td>
<td>For each of the school subjects listed below, mark an “X” in the statement that best describes your grades from the beginning of ninth grade until now. For each of the subjects: Math, Science, English and History/Social Studies the student will identify one of the following grade levels.</td>
</tr>
<tr>
<td></td>
<td>Point value</td>
</tr>
<tr>
<td></td>
<td>a. Mostly A’s</td>
</tr>
<tr>
<td></td>
<td>b. About half A’s and half B’s</td>
</tr>
<tr>
<td></td>
<td>c. Mostly B’s</td>
</tr>
<tr>
<td></td>
<td>d. About half B’s and half C’s</td>
</tr>
<tr>
<td></td>
<td>e. Mostly C’s</td>
</tr>
<tr>
<td></td>
<td>f. About half C’s and half D’s</td>
</tr>
<tr>
<td></td>
<td>g. Mostly D’s</td>
</tr>
<tr>
<td></td>
<td>h. Mostly below D</td>
</tr>
</tbody>
</table>

Grade points among the four core subjects will be averaged to represent academic performance.


Extracurricular activities. Students were surveyed about their level of involvement in various extracurricular activities. The question was duplicated from the Survey of High School Students (Alfeld et al., 2006) and used the following activities to identify extracurricular
participation: (a) athletics (club or intramural), (b) Boy Scouts or Girl Scouts, (c) Boys or Girls Clubs, (d) church youth group, (e) 4-H club, (f) Junior Livestock Associations, (g) athletics (school team), (h) band/choir, (i) class officer, (j) foreign language club, (k) math/science club, (l) military, reserve officer training corps (ROTC), (m) drama, (n) Distributive Education Clubs of America (DECA), and (o) other. DECA is an organization for high school and college students that promote leadership and entrepreneurship for marketing, finance, hospitality and management students around the globe (DECA Incorporated, 2010). The students were asked to identify their level of participation in each activity with a point value assigned as either local (1 pt), regional (2 pts), state (3 pts), or national (4 pts) participation or no participation (0 pts). The range of possible values was from 0 (no participation) to 60 (active in all activities at the national level). The values of the surveyed participants ranged from a minimum of 0 to a maximum of 19. The details of how the extracurricular activities variable was operationalized and its source are described in Table 7.

Table 7

*Extracurricular Activities Variable and Operationalization*

<table>
<thead>
<tr>
<th>Variable Descriptions</th>
<th>How operationalized</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extracurricular Activities</td>
<td>Have you participated in any of the following school-sponsored activities this past year? Please check one response for each activity.</td>
</tr>
<tr>
<td></td>
<td>Responding to each activity with no participation (0), local participation (1), regional participation (2), state participation (3), and national participation (4)</td>
</tr>
<tr>
<td></td>
<td>1. Athletics (Club or Intramural)…..</td>
</tr>
<tr>
<td></td>
<td>2. Boy Scouts or Girl Scouts……………………</td>
</tr>
<tr>
<td></td>
<td>3. Boys or Girls Clubs…………………………</td>
</tr>
<tr>
<td></td>
<td>4. Church Youth Group……………………</td>
</tr>
<tr>
<td></td>
<td>5. 4-H Club………………………………………..</td>
</tr>
<tr>
<td></td>
<td>6. Junior Livestock Associations…..</td>
</tr>
<tr>
<td></td>
<td>7. Athletics (School Team)……………………</td>
</tr>
</tbody>
</table>

(continued)
<table>
<thead>
<tr>
<th>Variable Descriptions</th>
<th>How operationalized</th>
</tr>
</thead>
<tbody>
<tr>
<td>8. Band/Choir</td>
<td></td>
</tr>
<tr>
<td>9. Class Officer</td>
<td></td>
</tr>
<tr>
<td>10. Foreign Language Club</td>
<td></td>
</tr>
<tr>
<td>11. Math/Science Club</td>
<td></td>
</tr>
<tr>
<td>12. Military (e.g. Junior. ROTC)</td>
<td></td>
</tr>
<tr>
<td>13. Drama</td>
<td></td>
</tr>
<tr>
<td>14. DECA</td>
<td></td>
</tr>
<tr>
<td>15. Other (specify):</td>
<td></td>
</tr>
</tbody>
</table>

Each activity was assigned a level of participation by each student. The point values identified above were summed for all activities for a total score.


**Peer influence.** The survey question addressing peer influence asked students about their friends’ intentions to attend college. The question was adapted from the Educational Longitudinal Study of 2002 (National Center for Education Statistics, 2002c). Students were asked to identify if (a) none (0 pts), (b) a few (1pt) (c) some (2 pts), (d) most (3 pts), or (e) all of their friends (4 pts) intended to attend either a 2 year or 4 year college. Other options (drop out of high school, work/military after high school) were available for the student to select but were not used to assess friends’ intention to attend college. The higher value between student responses to item (c) attend a 2 year college and item (d) attend a 4 year college was the value assigned to peer influence. A range of possible values was from 0 to 4. If values were missing the variable was coded as missing data. The details of how the peer influence variable was operationalized and its source are described in Table 8.
Table 8

Peer Influence Variable and Operationalization

<table>
<thead>
<tr>
<th>Variable Descriptions</th>
<th>How operationalized</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peer Influence</td>
<td><strong>What are the plans of your friends?</strong> (please check one response for each question) Point values are defined as follows: None (0), few (1), some (2), most (3), all (4)</td>
</tr>
<tr>
<td></td>
<td><strong>How many of your friends ...</strong> Select None, few, some, most, or all for each question</td>
</tr>
<tr>
<td></td>
<td>a. dropped/plan to drop out of high school without graduating?</td>
</tr>
<tr>
<td></td>
<td>b. plan to have a regular full-time job/military after high school?</td>
</tr>
<tr>
<td></td>
<td>c. plan to attend 2-year community college?</td>
</tr>
<tr>
<td></td>
<td>d. plan to attend a four-year college or university?</td>
</tr>
<tr>
<td></td>
<td>The higher value between student responses to item (c) attend 2 year college and item (d) attend 4 year college was the numerical value assigned to peer influence.</td>
</tr>
</tbody>
</table>


**Students’ initial senior-year aspirations.** At the beginning of the students’ senior year, students were asked to identify their educational aspirations. The options included: (a) complete less than high school graduation, (b) graduate from high school or obtain GED, (c) attend vocational, trade, or business school after high school, (d) receive Associate’s degree (2 years), (e) receive Bachelor’s degree (4 years), (f) obtain a Master’s degree or equivalent, or (g) obtain a Ph.D., M.D., or other advanced degree. This variable is used as a control variable. The question was adapted from the Educational Longitudinal Study of 2002 (National Center for Education Statistics, 2002b). The range of possible values was from 1 to 7.
**Students’ final senior-year aspirations.** At the end of the students’ senior year, students were asked to identify their educational aspirations. The options included: (a) complete less than high school graduation, (b) graduate from high school or obtain GED, (c) attend vocational, trade, or business school after high school, (d) receive Associate’s degree (2 years), (e) receive Bachelor’s degree (4 years), (f) obtain a Master’s degree or equivalent, or (g) obtain a Ph.D., M.D., or other advanced degree. This variable was the final senior-year aspirations variable. The question was adapted from the Educational Longitudinal Study of 2002 (National Center for Education Statistics, 2002b). The researcher is looking for change in educational aspirations and used initial senior-year aspirations variable and final senior-year aspirations variable to measure change in aspirations. The range of possible values was from 1 to 7. The details of how the students’ initial senior-year and final senior-year aspiration variables were operationalized and their source are described in Table 9.

Table 9

**Student Senior-Year Aspirations (initial and final) Variable and Operationalization**

<table>
<thead>
<tr>
<th>Variable Descriptions</th>
<th>How operationalized</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Aspirations (initial senior-year and final senior-year)</td>
<td>As things stand now, how far in school do you want to go?</td>
</tr>
<tr>
<td></td>
<td>1. Complete less than high school graduation</td>
</tr>
<tr>
<td></td>
<td>2. Graduate from high school or obtain GED</td>
</tr>
<tr>
<td></td>
<td>3. Attend vocational, trade, or business school after high school (1-2 years) or attend one or two years of college</td>
</tr>
<tr>
<td></td>
<td>4. Receive Associate’s degree (2 years)</td>
</tr>
<tr>
<td></td>
<td>5. Receive Bachelor’s degree (4 years)</td>
</tr>
<tr>
<td></td>
<td>6. Obtain a Master’s degree or equivalent</td>
</tr>
<tr>
<td></td>
<td>7. Obtain a Ph.D., M.D., or other advanced degree</td>
</tr>
</tbody>
</table>

Participation in dual credit (junior-year and senior-year). Data was received from the local community college (Central Midwest Community College) that was responsible for providing dual credit opportunities for the students at Midwest Area High School. An electronic file was received from the community college that identified college credits accumulated by participating students in their junior-year (2008-2009) and senior year (2009-2010). The credits were identified by student as academic or CTE college credit and separated by academic year. Academic dual credit and CTE dual credit is differentiated and coded by a program classification system (PCS) code. Academic courses are coded equal 1.1 and CTE courses are coded equal to 1.2 (Central Midwest Community College Board, 2010a). A listing of dual credit courses provided at Midwest Area High School can be found in Appendix A.

Control variable. At the time when initial senior-year aspirations were measured, some students had already experienced dual credit during their junior-year so credits earned during their junior-year were used as a control variable. Junior-year dual credit participation was represented by the total dual credit hours (academic and CTE) earned during the junior-year and called [Total Junior Dual Credit]. Since the number of complete cases (n=144) was small for the linear regression analysis, it was important to include a relatively small number of variables in the analysis thus, the researcher combined the variables junior-year academic dual credit hours and junior-year CTE dual credit hours, into a single variable called total junior dual credit hours.

Variables used in descriptive analysis. Participation in dual credit (dummy variable) during the junior and senior years in high school was used in descriptive analysis. The participation variable was dummy coded based on participation in any type of dual credit (either academic or CTE, or both) during the junior and/or senior year. Participation was coded equal to 1 and non-participation was coded equal to 0.
Type of dual credit participation was identified through the use of a categorical variable based on the total number of credit hours for each type of credit (academic and CTE) earned during both the junior and senior year. Academic dual credit courses are defined as dual credit courses with an academic focus and identified with a specific PCS code. CTE dual credit courses are defined as dual credit courses with a career and technical education focus and identified with a specific PCS code.

Technically, there could be four categories identified in the research sample: (a) academic dual credit, (b) CTE dual credit, (c) both academic and CTE dual credit, and (d) non-participation. Since the sample contained a small number of students (18) who participated in both academic and CTE dual credit during the junior and senior years, the researcher used the following method to group the students into the other three existing categories. Students who had completed more credit hours in academic courses at the community college were categorized as academic dual credit participants and students who completed more credit hours in CTE courses at the community college were categorized as CTE dual credit participants. For example, if the student earned more credit hours in academic dual credit (during the junior and senior year) compared to CTE dual credit (during the junior and senior year) the student was categorized in the academic dual credit group and vice versa. If the academic dual credit hours equaled the CTE dual credit hours (during the junior and senior year) the student was categorized in the CTE dual credit group. Non-participants earned zero dual credit hours in both the junior and senior year. The types of dual credit categories are called academic dual credit, CTE dual credit, and non-participation and the number of participants in each group is 68, 46, and 49 respectively.

Variables used in regression analysis. Participants were categorized into dual credit participation groups (academic, CTE, or non-participation) based on participation during the
senior-year. This categorical variable is different from the previous categorical variable in that only senior year participation is assessed compared to both junior and senior year participation described above. Technically, there could be four groups identified based on participation during the senior-year in the research sample: (a) academic dual credit, (b) CTE dual credit, (c) both academic and CTE dual credit, and (d) non-participation. Since the sample contained a small number of students (12) who participated in both academic and CTE dual credit during the senior-year the researcher used the following method to group the students into the other three existing categories. Students who participated in both academic and CTE dual credit in their senior year were recoded based on the highest value of total credit hours earned by type. For students earning more academic dual credit compared to CTE dual credit in their senior year, they were coded as academic. For students earning more CTE dual credit compared to academic dual credit, they were coded as CTE. If the academic dual credit hours equaled the CTE dual credit hours during the senior year the student was recoded in the CTE dual credit group. There were three participants in the sample who met this criterion. Dummy variables [Senior Academic Dual Credit] and [Senior CTE Dual Credit] were created to represent participation in senior academic dual credit and participation in senior CTE dual credit. For a comparison of academic dual credit hours earned and CTE dual credit hours earned by participants see a crosstabulation matrix in Appendix L. The details of how the dual credit participation variables were operationalized are described in Table 10.
Table 10

Dual Credit Participation Variable Descriptions and Operationalization

<table>
<thead>
<tr>
<th>Variable Descriptions</th>
<th>How operationalized</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dual Credit Hours</td>
<td>Dual credit hours were identified as academic dual credit and CTE dual credit based on Central Midwest Community College Board program classification system (2010a) and differentiated by junior and senior years in high school.</td>
</tr>
<tr>
<td>Total junior-year dual credit</td>
<td>Sum of the total dual credit hours earned during the junior-year, both academic and CTE.</td>
</tr>
<tr>
<td>(control variable)</td>
<td></td>
</tr>
<tr>
<td>Type of Dual Credit</td>
<td>Categories created for descriptive analysis (credit earned during junior and/or senior year):</td>
</tr>
<tr>
<td>(categorical variable used in</td>
<td>1 = Academic dual credit</td>
</tr>
<tr>
<td>descriptive analysis)</td>
<td>3 = CTE dual credit</td>
</tr>
<tr>
<td></td>
<td>4 = neither academic nor CTE dual credit (non-participation)</td>
</tr>
<tr>
<td>Participation in dual credit</td>
<td>Participation in either academic or CTE dual credit during the junior or senior year = 1</td>
</tr>
<tr>
<td>(dummy variable used in descriptive</td>
<td>Non-participation = 0</td>
</tr>
<tr>
<td>analysis)</td>
<td></td>
</tr>
<tr>
<td>Participation in senior-year</td>
<td>Senior Academic Dual Credit = 1, Other = 0</td>
</tr>
<tr>
<td>dual credit (dummy variables used in</td>
<td>Senior CTE Dual Credit = 1, Other = 0</td>
</tr>
<tr>
<td>linear regression)</td>
<td>Non-participation = 0, Other = 0</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Interaction terms. Interaction effects are manifested in the presence of non-additive effects of independent variables on a dependent variable. An interaction term is a product of two or more other variables (Allen, 1997). Testing for interaction effects between two independent variables allows researchers to understand the conditions under which relationships between variables change in strength and direction, and provides information on whether the relationship between two variables is contingent upon the value of a third variable (Aguinis & Gottfredson,
2010). Based on previous research findings on aspiration development and college decision making, results indicate differences related to parental expectations and gender (Hossler & Stage, 1992; Stage & Hossler, 1989) and differences related to GPA and race/ethnicity (Portes & Wilson, 1976) and differences related to parents’ education and SES, and both variables combined (Hamrick & Stage, 2004; Kao & Tienda, 1998). It is therefore important to analyze interaction terms for participation in senior-year dual credit (academic, CTE, non-participation) with gender and race/ethnicity (a two-way interaction), and for participation in senior-year dual credit (academic, CTE, non-participation) with both gender and race/ethnicity combined (a three-way interaction).

The following two-way interaction terms were created and analyzed in the regression model: gender and participation in senior year academic dual credit [male X SeniorAcadDC], gender and participation in senior year CTE dual credit [male X SeniorCTEDC], race/ethnicity and participation in senior year academic dual credit [white X SeniorAcadDC], race/ethnicity and participation in senior year CTE dual credit [white X SeniorCTEDC], income status and participation in senior year academic dual credit [LowInc X SeniorAcadDC], and income status and participation in senior year CTE dual credit [LowInc X SeniorCTEDC] to determine their relationship to students’ changing senior-year aspirations.

Three-way interactions between gender, race/ethnicity, and dual credit participation were analyzed in the regression model. The following three-way interaction terms were created: gender and race/ethnicity and participation in senior year academic dual credit [male X white X SeniorAcadDC] and gender and race/ethnicity and participation in senior year CTE dual credit [male X white X SeniorCTEDC].
**Methods for Analyzing**

After data entry and all necessary recoding of variables, the data was analyzed using the Statistical Package for Social Sciences® (SPSS) software version 17.0. This study used an alpha level of $\alpha = .05$, which is most commonly used in social and behavioral sciences as the criterion for statistical significance (Murphy & Myors, 2004; Yockey, 2008).

Table 11 represents each research question, the variables involved, and the method of data analysis.

Table 11

*Data Analysis for Each Research Question*

<table>
<thead>
<tr>
<th>Research Questions</th>
<th>Variables</th>
<th>Statistical Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research Question 1</td>
<td>Student Characteristics, Significant Others’ influence, Extracurricular activities, and student’s aspirations among dual credit participation groups (any dual credit participation, academic dual credit participation, CTE dual credit participation, non-participation)?</td>
<td>Descriptive analysis, Chi-square analysis, ANOVA with post hoc analysis, paired samples t test, Pearson correlation</td>
</tr>
<tr>
<td></td>
<td>Type of senior year dual credit participation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Type of junior-year and senior-year dual credit participation</td>
<td></td>
</tr>
<tr>
<td>Research Question 2</td>
<td>Control Variables: Junior-year Dual Credit, Initial aspirations, Student Characteristics, Significant Others’ influence, Extracurricular activities</td>
<td>Hierarchical multiple linear regression analysis</td>
</tr>
<tr>
<td></td>
<td>Independent Variable: Type of senior year dual credit participation (academic, CTE, none)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dependent Variable: Change in Aspirations</td>
<td></td>
</tr>
</tbody>
</table>
### Table 11 (continued)

<table>
<thead>
<tr>
<th>Research Questions</th>
<th>Variables</th>
<th>Statistical Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Research Question 3</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Is there a difference between males and females in how participation in senior-year dual credit influences student’s final senior-year aspirations while controlling for initial educational aspirations, junior-year dual credit hours, race/ethnicity, GPA, significant others’ influence, and extracurricular activities? | **Control Variables:**  
  Junior-year Dual Credit  
  Initial aspirations  
  Race/ethnicity  
  GPA  
  Significant Others’ influence  
  Extracurricular activities  | **Hierarchical multiple linear regression analysis including interaction terms for gender and type of participation in senior-year dual credit**  
  **Independent Variable:**  
  Type of senior year dual credit participation (academic, CTE, none)  
  **Dependent Variable:**  
  Change in Aspirations  
  **Interaction Terms:**  
  Male X Type of participation in dual credit |
| **Research Question 4** | | |
| Is there a difference between whites and non-whites in how participation in senior-year dual credit influences student’s final senior-year aspirations while controlling for initial educational aspirations, junior-year dual credit hours, gender, GPA, significant others’ influence, and extracurricular activities? | **Control Variables:**  
  Junior-year Dual Credit  
  Initial aspirations  
  Gender  
  GPA  
  Significant Others’ influence  
  Extracurricular activities  | **Hierarchical multiple linear regression analysis including interaction terms for race/ethnicity and type of participation in senior-year dual credit**  
  **Independent Variable:**  
  Type of senior year dual credit participation (academic, CTE, none)  
  **Dependent Variable:**  
  Change in Aspirations  
  **Interaction Terms:**  
  White X Type of participation in dual credit |
| **Research Question 5** | | |
| Is there a difference between whites and non-whites that depends on gender in how participation in senior-year dual credit influences student’s final aspirations? | **Control Variables:**  
  Junior-year Dual Credit  
  Initial aspirations  
  GPA  
  Significant Others’ Influence  | **Hierarchical multiple linear regression analysis including interaction terms for gender, race/ethnicity, and type** |

(continued)
Table 11 (continued)

<table>
<thead>
<tr>
<th>Research Questions</th>
<th>Variables</th>
<th>Statistical Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>senior-year aspirations while controlling for initial education aspirations, junior-year dual credit hours, GPA, significant others’ influence, and extracurricular activities?</td>
<td>Extracurricular activities</td>
<td>of participation in senior-year dual credit</td>
</tr>
<tr>
<td></td>
<td>Independent Variable:</td>
<td>Type of senior year dual credit participation (academic, CTE, none)</td>
</tr>
<tr>
<td></td>
<td>Dependent Variable:</td>
<td>Change in Aspirations</td>
</tr>
<tr>
<td></td>
<td>Interaction Terms:</td>
<td>White X Type of participation in dual credit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Male X Type of participation in dual credit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>White X Male X Type of participation in dual credit</td>
</tr>
</tbody>
</table>

Research Question 6

Is there a difference between low income students and others in how participation in senior-year dual credit influences student’s final senior-year aspirations while controlling for initial educational aspirations, junior-year dual credit hours, student characteristics, parents’ education, parents’ expectations, peer influence, and extracurricular activities?

<table>
<thead>
<tr>
<th>Control Variables:</th>
<th></th>
<th>Hierarchical multiple linear regression analysis including interaction terms for income status and type of participation in senior-year dual credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Junior-year Dual Credit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initial aspirations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student Characteristics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parents’ education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parents’ expectations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peer influence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extracurricular activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Independent Variable:</td>
<td></td>
<td>Type of senior year dual credit participation (academic, CTE, none)</td>
</tr>
<tr>
<td>Dependent Variable:</td>
<td></td>
<td>Change in Aspirations</td>
</tr>
<tr>
<td>Interaction Terms:</td>
<td></td>
<td>Low income X Type of participation in dual credit</td>
</tr>
</tbody>
</table>

Research Question One

Descriptive analysis. Descriptive analysis was used to identify the characteristics of students who participated in academic dual credit, CTE dual credit, or did not participate in dual credit using crosstabulation, Chi-square analysis, and ANOVA analysis with post hoc statistics.
Crosstabulation and Chi-square test of independence. Chi-square analysis was performed between gender, race/ethnicity, and income status and the dichotomized variable [participation in any dual credit]. Chi-square analysis was also performed between gender, race/ethnicity, and income status and a categorical variable [type of participation in dual credit] representing academic dual credit participation, CTE dual credit participation, and non-participation.

Pairwise comparisons. To further differentiate between participation groups, pairwise comparisons were performed for each of the demographic variables (gender, race/ethnicity, and income status). Multiple comparisons must control the type I error probability (Green & Salkind, 2008). The Bonferroni method of adjustment was used for the pairwise comparison among participation types.

ANOVA and post-hoc statistics. One-way analysis of variance (ANOVA) was used to determine if the following independent samples came from populations with different means (Stern, 2010). The independent variable was type of participation in dual credit (academic dual credit, CTE dual credit, and non-participation). The dependent variables that were analyzed included: (a) students’ final senior-year aspirations, (b) parents’ expectations, (c) parents’ education, (d) household income, (e) extracurricular activities, (f) peer influence, and (g) GPA. After initial analysis two variables did not meet the underlying assumption that the variances of values of the dependent variables were equal in the three populations. This was indicated by the Levene test for homogeneity of variance. A significant value ($p < .001$) for the Levene Statistic was found in GPA and peer influence, therefore alternative testing was required. An alternative test to the one-way ANOVA is the Brown-Forsythe $F$-ratio (Stern, 2010; Yockey, 2008).
An index of effect size, eta squared ($\eta^2$) was reported and is interpreted in much the same way as $r^2$. Values range from 0 to 1 with high values indicating a high proportion of variance in the dependent variable that can be accounted for by variation in the independent variable. Eta-squared values .01, .06, and .14 roughly correspond to a small, medium, and large effect size (Cohen, 1988). The $F$ statistic was reported for each ANOVA analysis. A significant $F$ value indicates the means of all populations being considered are probably not equal (Stern, 2010). Post hoc tests are used to examine differences in means of the participation groups. Tukey HSD post hoc tests were performed on all dependent variables that met the assumption of homogeneity of variance. Dunnett T3 post hoc tests were performed on dependent variables that had a significant Levene Statistic and significant F value on the Brown-Forsythe test. Dunnett T3 is a post hoc test that does not assume equal variances between the groups (Yockey, 2008).

**Paired samples t Test.** In an effort to determine if significant differences exist between student’s initial aspirations and student’s final aspirations paired samples t tests (dependent t tests) were performed among the groups (senior-year academic dual credit participants, senior-year CTE dual credit participants, and senior-year non-participants). The groups were then further differentiated by gender, race/ethnicity, and income status. This test is used to compare the mean of one sample to the mean of another sample when the samples are naturally related in some manner (Yockey, 2008)

**Pearson correlation matrix.** According to Cohen (1988) correlation ($r$) values equal to +/- .10, +/- .30, and +/- .50 are representative of small, moderate, and strong correlations, respectively. Correlation analysis was used to determine whether two measured variables co-vary, to quantify the strength of the linear relationship between the variables, and to validate the need to control variables when performing regression analysis.
Research Questions Two, Three, Four, Five, and Six

In addressing research question two, three, four, five, and six, the researcher used hierarchical multiple linear regression analysis to assess statistical significance of the variables identified in the hypotheses. Multiple linear regression analysis was used because this form of multivariate analysis provided several benefits. These benefits include: (a) \( R^2 \) defines the proportion of variance in the dependent variable explained using the weighted combination of independent variables, (b) a significant \( F \) statistic indicates the variance of the dependent variable accounted for by the weighted set of independent variables exceeds what could be expected by chance, and (c) with a significant \( R^2 \) there is a nonzero linear relation between the dependent and independent variables (Stern, 2010) and (d) hierarchical multiple linear regression allows the researcher to incrementally add one or more predictor variables to a regression equation (model) to determine if the variables will significantly increase the predictability of the criterion (Jaccard & Turrisi, 2003).

Research question two was analyzed using hierarchical multiple linear regression. The formula for multiple linear regression (MLR) is \( Y = a + b_1X_1 + b_2X_2 + \ldots + b_kX_k + e \) (Pedhazur, 1997). Two models were presented. Model 1 contained all control variables. Model 2 contained all control variables and also the dummy variable representing participation in senior academic and CTE dual credit. The \( F \) statistics, \( R^2 \) values, change in \( R^2 \), and significance of regression coefficients were analyzed.

Research questions three, four, five, and six were analyzed using hierarchical multiple linear regression including interaction terms of dual credit participation with gender (research question three), race/ethnicity (research question four), gender and race/ethnicity combined (research question five), and income status (research question six). Models including two-way
and three-way interaction terms were presented. The formula for a multiple linear regression equation with two-way interaction terms is:

\[ Y = a + b_1 X_1 + b_2 X_2 + \ldots + b_k X_k + b_j X_j + b_{ij} (X_k X_j) + e \]  

(Jaccard & Turrisi, 2003). Three models were presented. Model 1 contained all control variables and the variables representing participation in senior academic and CTE dual credit. Model 2 contained all the control variables, participation in senior academic and CTE dual credit variables, and added the two-way interaction terms. Model 3 contained all the control variables, participation in senior academic and CTE dual credit variables, the two-way interaction terms, and the three-way interaction terms. The formula for a multiple linear regression using three-way interaction terms is:

\[ Y = a + b_1 X_1 + b_2 X_2 + \ldots + b_k X_k + b_j X_j + b_l X_l + b_{ij} (X_k X_j) + b_{il} (X_k X_l) + b_{ijl} (X_k X_j X_l) + e \]  

(Jaccard & Turrisi, 2003). Analysis included the \( F \) statistics, \( R^2 \) values, change in \( R^2 \), and significance of regression coefficients was analyzed. Considering the small number of complete cases in the sample and the number of variables in the regression model, results are analyzed to determine if any of the variables could be removed to reflect a more accurate representation of regression coefficients.
Chapter 4

Findings

This chapter provides results of the quantitative research obtained through high school student questionnaire responses and credit-hour completion obtained from transcript data from the community college for dual credit completed during the junior and senior years of high school. This research was conducted to determine the influence of dual credit course completion on the change in high school seniors’ aspirations for college while controlling for student characteristics, significant others’ influence, junior-year dual credit completed, and extracurricular activities. This chapter is organized into four sections which include the following: (a) descriptive analysis, (b) research question one, (c) research question two, and (d) research questions three, four, five, and six.

Descriptive Analysis

The composition of the research sample from Midwest Area High School is represented in Table 12. The gender mix of the sample is 55% male and 45% female. The race/ethnicity mix of the sample is 71% white and 29% non-white. The sample is 34% low income and 66% other income.

Table 12

<table>
<thead>
<tr>
<th>Gender, Race/ethnicity, and Income Status of Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
</tr>
<tr>
<td>-----------------------------------</td>
</tr>
<tr>
<td>Total Sample</td>
</tr>
<tr>
<td>White</td>
</tr>
<tr>
<td>Non-white</td>
</tr>
<tr>
<td>Low Income</td>
</tr>
<tr>
<td>Other</td>
</tr>
</tbody>
</table>
Research Question One

Research question one asks if there are any differences in student characteristics, significant others’ influence, extracurricular activities, and student’s aspirations among dual credit participation groups [dual credit participation (either academic or CTE dual credit), academic dual credit participation, CTE dual credit participation, non-participation]. This question is answered using crosstabulation and Chi-square analysis, and ANOVA with post hoc tests.

Data were gathered from high school seniors and participation (college credit hours completed) in any dual credit was obtained from the community college for the students’ junior and senior years. Using the dichotomous variable of any dual credit participation during the junior and senior years and non-participation, crosstabulations and Chi Square analysis were used to determine if a relationship existed between gender, race/ethnicity, or income status, and dual credit participation. Table 13 shows that there is not a significant relationship between gender and participation in dual credit \( \chi^2 (1, N = 163) = .067, p > .05 \), with close to 70% of each group participating. Analysis of race/ethnicity shows that a significant relationship \( \chi^2 (1, N = 163) = 6.064, p < .05 \) exists between race/ethnicity and participation in some form of dual credit. Results show white students (76%) participate in dual credit more than non-white students (56%). There was also a significant relationship between income status and participation in dual credit \( \chi^2 (1, N = 163) = 17.160, p < .001 \) with low income students participating in dual credit at a lower rate (49%) than non-low income students (81%).
Table 13

*Crosstabulation and Chi-square Analysis for Gender, Race/Ethnicity, and Income Status, and Participation in Dual Credit*

<table>
<thead>
<tr>
<th>Variables</th>
<th>Participation in Dual Credit</th>
<th>Did Not Participate in Dual Credit</th>
<th>%</th>
<th>Total</th>
<th>% of Total</th>
<th>$\chi^2$</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>63</td>
<td>26</td>
<td>70.8%</td>
<td>29.2%</td>
<td>89</td>
<td>54.6%</td>
<td>.067</td>
<td>1</td>
</tr>
<tr>
<td>Female</td>
<td>51</td>
<td>23</td>
<td>68.9%</td>
<td>31.1%</td>
<td>74</td>
<td>45.4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>87</td>
<td>28</td>
<td>75.7%</td>
<td>24.3%</td>
<td>115</td>
<td>70.6%</td>
<td>6.064</td>
<td>1</td>
</tr>
<tr>
<td>Non-White</td>
<td>27</td>
<td>21</td>
<td>56.3%</td>
<td>43.7%</td>
<td>48</td>
<td>29.4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Income</td>
<td>27</td>
<td>28</td>
<td>49%</td>
<td>51%</td>
<td>55</td>
<td>33.7%</td>
<td>17.160</td>
<td>1</td>
</tr>
<tr>
<td>Other</td>
<td>87</td>
<td>21</td>
<td>81%</td>
<td>19%</td>
<td>108</td>
<td>66.3%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* *p < .05. **p < .001

**Analysis of participation groups.** Referring back to the research sample, students were categorized as participants in specific types of dual credit (academic dual credit or CTE dual credit) and those who did not participate at all during the junior and senior years of high school. The analysis of the participation groups, referring to the academic dual credit participants, the CTE dual credit participants, and non-participants include a comparison of frequency distributions on gender, race/ethnicity, and income status. Table 14 presents the crosstabulation of type of dual credit participation by gender. Forty-two percent of the sample participates in academic dual credit, 28% participates in CTE dual credit, and 30% did not participate in any type of dual credit. The Chi-square analysis shows an association between gender and type of dual credit participation [$\chi^2 (2, N = 163) =23.331, p < .001$]. Pairwise comparisons to identify the significant differences between the various participation groups are displayed in Table 15.
Table 14

*Crosstabulation and Chi-square Analysis of Type of Dual Credit Participation by Gender*

<table>
<thead>
<tr>
<th>Type of Dual Credit</th>
<th>Male</th>
<th></th>
<th>Female</th>
<th></th>
<th>Total</th>
<th>%</th>
<th>χ²</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Dual Credit</td>
<td>25</td>
<td>28%</td>
<td>43</td>
<td>58%</td>
<td>68</td>
<td>42%</td>
<td>23.331</td>
<td>2</td>
<td>.000*</td>
</tr>
<tr>
<td>CTE Dual Credit</td>
<td>38</td>
<td>43%</td>
<td>8</td>
<td>11%</td>
<td>46</td>
<td>28%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neither Academic nor CTE Dual Credit</td>
<td>26</td>
<td>29%</td>
<td>23</td>
<td>31%</td>
<td>49</td>
<td>30%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>89</td>
<td>100%</td>
<td>74</td>
<td>100%</td>
<td>163</td>
<td>100%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* p < .001

To analyze the relationships using pairwise comparisons, the Bonferroni method of adjustment was used. The Bonferroni method is used to control for Type I error across the pairwise comparisons of participation types (Green & Salkind, 2008). With the Bonferroni method the probability to yield a .05 significance level is the alpha level for the comparisons divided by the number of comparisons \[ p = .05/3 = .0167 \]. The significant differences revealed in Table 15 are the relationships between gender and academic or CTE dual credit \[ χ² (1, N = 114) = 23.325, p < .0167 \] and between gender and CTE dual credit or non-participation \[ χ² (1, N = 95) = 9.432, p < .0167 \]. Females (84%) participate significantly more than males (40%) in academic rather than CTE dual credit and males (60%) participated significantly more in CTE dual credit rather academic dual credit and males (59%) participate significantly more than females (26%) in CTE dual credit rather than non-participation. Females are more likely to be a non-participant than participate in CTE dual credit. There is no significant difference in gender between academic dual credit and non-participation.
Table 15

*Crosstabulation and Chi-square Analysis of Type of Dual Credit Participation by Gender using Bonferroni Adjustment*

<table>
<thead>
<tr>
<th>Type of Dual Credit</th>
<th>Male</th>
<th>Female</th>
<th>( \chi^2 )</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Dual Credit</td>
<td>25</td>
<td>43</td>
<td>23.325</td>
<td>1</td>
<td>.000*</td>
</tr>
<tr>
<td>CTE Dual Credit</td>
<td>38</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic Dual Credit</td>
<td>25</td>
<td>43</td>
<td>3.076</td>
<td>1</td>
<td>.079</td>
</tr>
<tr>
<td>Neither Academic nor CTE Dual</td>
<td>26</td>
<td>23</td>
<td>9.432</td>
<td>1</td>
<td>.002*</td>
</tr>
<tr>
<td>CTE Dual Credit</td>
<td>38</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neither Academic nor CTE Dual</td>
<td>26</td>
<td>23</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* with Bonferroni adjustment \( p < .0167 \) for \( \alpha = .05 \)

Race/ethnicity was dichotomized into two categories, white and non-white. Analyzing the relationship between race/ethnicity and type of dual credit participation using Chi-square statistics, a significant relationship is found \( \chi^2 (2, N = 163) = 14.919, p < .01 \). Results are shown in Table 16. Pairwise comparisons to identify the significant differences between the various participation groups are displayed in Table 17.

Table 16

*Crosstabulation and Chi-square Analysis of Type of Dual Credit Participation by Race/ethnicity*

<table>
<thead>
<tr>
<th>Type of Dual Credit</th>
<th>White</th>
<th>Non-white</th>
<th>( \chi^2 )</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Dual Credit</td>
<td>59</td>
<td>9</td>
<td>14.919</td>
<td>2</td>
<td>.001*</td>
</tr>
<tr>
<td>CTE Dual Credit</td>
<td>28</td>
<td>18</td>
<td>28%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neither Academic nor CTE Dual Credit</td>
<td>28</td>
<td>21</td>
<td>30%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* \( p < .01 \)
Using pairwise comparisons results and Bonferroni adjustment, Table 17 shows significant differences between the distribution of white and non-white participants in academic dual credit as opposed to CTE dual credit $[\chi^2(1, N=114) = 10.179, p < .0167]$ and between academic dual credit as opposed to no dual credit $[\chi^2(1, N=117) = 13.106, p < .0167]$. Significantly more white students (68%) participate in academic dual credit than CTE dual credit (32%) and significantly more non-white students participate in CTE dual credit (67%) than academic dual credit (33%). In comparing academic dual credit and non-participation, white students (68%) participate significantly more in academic dual credit than non-white students (30%) and more non-white students (70%) are non-participants compared to white students (32%). Academic and CTE dual credit participants show significant differences between white and non-white students in that the CTE dual credit participants are less likely to be white compared to the academic participants. There is not a significant difference in participation between white and non-white student in CTE dual credit as opposed to no dual credit identified through pairwise comparison with the Bonferroni adjustment.

Table 17

_Crosstabulation and Chi-square Analysis of Type of Dual Credit Participation by Race/ethnicity using Bonferroni Adjustment_

<table>
<thead>
<tr>
<th>Type of Dual Credit</th>
<th>White</th>
<th></th>
<th>Non-white</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>%</td>
<td>Number</td>
<td>%</td>
<td>$\chi^2$</td>
<td>df</td>
</tr>
<tr>
<td>Academic Dual Credit</td>
<td>59</td>
<td>68%</td>
<td>9</td>
<td>33%</td>
<td>10.179</td>
<td>1</td>
</tr>
<tr>
<td>CTE Dual Credit</td>
<td>28</td>
<td>32%</td>
<td>18</td>
<td>67%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic Dual Credit</td>
<td>59</td>
<td>68%</td>
<td>9</td>
<td>30%</td>
<td>13.106</td>
<td>1</td>
</tr>
<tr>
<td>Neither Academic nor CTE</td>
<td>28</td>
<td>32%</td>
<td>21</td>
<td>70%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dual Credit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neither Academic nor CTE</td>
<td>28</td>
<td>50%</td>
<td>18</td>
<td>46%</td>
<td>.136</td>
<td>1</td>
</tr>
<tr>
<td>Dual Credit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* with Bonferroni adjustment $p < .0167$ for $\alpha = .05$
Analyzing the relationship between low income status and participation in different types of dual credit using Chi-square statistics, an association between the income status and type of dual credit participation is found \( \chi^2 (2, N = 163) = 21.409, p < .001 \) as shown in Table 18.

There is significant relationship between the type of dual credit and income status. Pairwise comparisons to identify the significant differences between the various participation groups are displayed in Table 19.

Table 18

*Crosstabulation and Chi-square Analysis of Type of Dual Credit Participation by Income Status*

<table>
<thead>
<tr>
<th>Type of Dual Credit</th>
<th>Low Income</th>
<th></th>
<th>Other</th>
<th></th>
<th>( \chi^2 )</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Dual Credit</td>
<td>11</td>
<td>20%</td>
<td>57</td>
<td>53%</td>
<td>21.409</td>
<td>2</td>
<td>.000*</td>
</tr>
<tr>
<td>CTE Dual Credit</td>
<td>16</td>
<td>29%</td>
<td>30</td>
<td>28%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neither Academic nor CTE Dual Credit</td>
<td>28</td>
<td>51%</td>
<td>21</td>
<td>19%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>55</strong></td>
<td><strong>100%</strong></td>
<td><strong>108</strong></td>
<td><strong>100%</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* \( p < .001 \)

Using pairwise comparisons and the Bonferroni adjustment, the only significant relationship that is found is between income status and academic dual credit participation as opposed to non-participation \( \chi^2 (1, N = 117) = 21.507, p < .0167 \). Table 19 shows there is no significant relationship between income status and academic dual credit versus CTE dual credit or between income status and CTE dual credit as opposed to non-participation. Low income status students (72%) are more likely to be non-participants compared to other income status students (27%) and other income status students are more likely to participate in academic dual credit (73%) compared to low income status students (28%).
Table 19

*Crosstabulation and Chi-square Analysis of Type of Dual Credit Participation by Income Status using Bonferroni Adjustment*

<table>
<thead>
<tr>
<th>Type of Dual Credit</th>
<th>Low Income</th>
<th>Other</th>
<th>χ²</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Dual Credit</td>
<td>11 (41%)</td>
<td>57 (66%)</td>
<td>5.255</td>
<td>1</td>
<td>.022</td>
</tr>
<tr>
<td>CTE Dual Credit</td>
<td>16 (59%)</td>
<td>30 (34%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic Dual Credit</td>
<td>11 (28%)</td>
<td>57 (73%)</td>
<td>21.507</td>
<td>1</td>
<td>.000*</td>
</tr>
<tr>
<td>Neither Academic nor CTE Dual Credit</td>
<td>28 (72%)</td>
<td>21 (27%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CTE Dual Credit</td>
<td>16 (36%)</td>
<td>30 (59%)</td>
<td>4.771</td>
<td>1</td>
<td>.029</td>
</tr>
<tr>
<td>Neither Academic nor CTE Dual Credit</td>
<td>28 (64%)</td>
<td>21 (41%)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*with Bonferroni adjustment p < .0167 for α = .05

One-way ANOVA was performed on the following variables: students’ final senior-year aspirations, parents’ expectations, parents’ education, extracurricular activities, household income, GPA, and peer influence. The variables were analyzed by type of participation in dual credit. Post hoc tests were conducted to ascertain pairwise differences. Eta-square (η²) is the percentage of variance in the dependent variable that is accounted for by the independent variable (Yockey, 2008). The effect size (η²) for all variables ranged from η² = .04 to η² = .33. These small to large effect sizes (.01, .06, and .14; small, medium, large respectively (Cohen, 1988)) indicate type of participation accounted for 4% to 33% of the variance in various dependent variables. Based on the Levene Statistic the assumption of homogeneity of variance was acceptable for all variables except GPA and peer influence. See Table 20 for Tukey post hoc statistics for all variables except the GPA and peer influence. The F statistic for the Brown-Forsythe test for the relationship between peer influence and type of dual credit participation was not significant therefore post hoc tests were not performed. See Table 21 for Dunnett T3 post hoc statistics for GPA.
Students’ final senior-year aspirations. There was a significant relationship between the type of dual credit participation and the students’ final senior-year aspirations shown by ANOVA analysis \([F(2,160) = 11.453, \ p < .001, \ \eta^2 = .13]\). Multiple comparisons of students’ final senior-year aspirations by type of participation in dual credit using the Tukey post hoc test identified that students who participated in academic dual credit \((M_{\text{final asp}} = 5.75, \ SD_{\text{final asp}} = 1.084)\) had a significantly higher mean for final senior-year aspirations than students participating in CTE dual credit \((M_{\text{final asp}} = 4.80, \ SD_{\text{final asp}} = 1.408)\) and students who did not participate in any dual credit \((M_{\text{final asp}} = 4.73, \ SD_{\text{final asp}} = 1.440)\) at the \(p < .01\) and \(p < .001\) levels, respectively. There was no significant difference between non-participants \((M_{\text{final asp}} = 4.73, \ SD_{\text{final asp}} = 1.440)\) and students’ participating in CTE dual credit \((M_{\text{final asp}} = 4.80, \ SD_{\text{final asp}} = 1.408)\). Students who participated in academic dual credit had a mean final senior-year aspiration level between completing a bachelor’s degree and obtaining a master’s degree. Students participating in CTE dual credit or participating in no dual credit had final senior-year aspirations between receiving an associate’s degree and completing a bachelor’s degree.

Parents’ expectations. There was a significant relationship between the type of dual credit participation and the parents’ expectations shown by ANOVA analysis \([F(2,158) = 12.840, \ p < .001, \ \eta^2 = .14]\). Multiple comparisons of parents’ expectations by type of participation in dual credit using the Tukey post hoc test identified that students who participated in academic dual credit \((M_{\text{parents' exp}} = 5.81, \ SD_{\text{parents' exp}} = .885)\) had a significantly higher mean for parents’ expectations than students participating in CTE dual credit \((M_{\text{parents' exp}} = 4.78, \ SD_{\text{parents' exp}} = 1.172)\) and students who did not participate in any dual credit \((M_{\text{parents' exp}} = 5.11, \ SD_{\text{parents' exp}} = 1.323)\) at the \(p < .001\) and \(p < .01\) levels, respectively. There was no significant difference in parents’ expectations for students participating in CTE dual credit \((M_{\text{parents' exp}} =\)
4.78, $SD_{parents'exp} = 1.172$) and non-participants ($M_{parents'exp} = 5.11, SD_{parents'exp} = 1.323$). Students’ participating in academic dual credit reported their parents expected them to achieve between completing a bachelor’s degree and obtaining a master’s degree. Non-participants also had parents who expected them to achieve beyond the bachelor’s degree but not as far beyond it as the academic dual credit participants. The CTE dual credit participants’ parents had lower expectations, between receiving an associate’s degree and completing a bachelor’s degree.

**Parents’ education.** There was a significant relationship between the type of dual credit participation and the parents’ education shown by ANOVA analysis \[F(2,149) = 12.958, p < .001, \eta^2 = .15\]. Multiple comparisons of parents’ education by type of participation in dual credit using the Tukey post hoc test identified that students who participated in academic dual credit ($M_{parents'ed} = 4.61, SD_{parents'ed} = 1.445$) had a significantly higher mean for parents’ education than students participating in CTE dual credit ($M_{parents'ed} = 3.43, SD_{parents'ed} = 1.346$) and students who did not participate in any dual credit ($M_{parents'ed} = 3.43, SD_{parents'ed} = 1.421$) with a $p < .001$ for both tests. There was no significant difference in parents’ education between the non-participants ($M_{parents'ed} = 3.43, SD_{parents'ed} = 1.421$) and CTE dual credit students ($M_{parents'ed} = 3.43, SD_{parents'ed} = 1.346$). Students participating in academic dual credit had parents who had a mean education level between an associate’s degree and a bachelor’s degree. Parents of both CTE participants and non-participants had mean education levels between 1 and 2 years of a vocational/trade/business school and an associate’s degree. Academic dual credit participants had parents who may have had some 4-year college experience compared to no 4-year college experience by the parents’ of CTE dual credit participants or non-participants.

**Household income.** There was a significant relationship between the type of dual credit participation and the household income using ANOVA \[F(2,160) = 13.529, p < .001, \eta^2 = .14\].
Tukey post hoc tests indicated that students who participated in academic dual credit ($M_{\text{income}} = 72,058$, $SD_{\text{income}} = 32,590$) had a significantly higher mean on household income than students participating in CTE dual credit ($M_{\text{income}} = 51,080$, $SD_{\text{income}} = 27,609$, $p < .01$) and students who did not participate in any dual credit ($M_{\text{income}} = 42,792$, $SD_{\text{income}} = 33,423$, $p < .001$). Participants in CTE dual credit ($M_{\text{income}} = 51,080$, $SD_{\text{income}} = 27,609$) had no significant difference in mean household income from non-participants ($M_{\text{income}} = 42,792$, $SD_{\text{income}} = 33,423$) even though non-participants came from households with a somewhat lower mean income than CTE participants.

**Extracurricular activities.** There was a small but significant relationship between the type of dual credit participation and the students’ extracurricular activities using ANOVA $[F(2,158) = 4.496, p < .05, \eta^2 = .05]$. Multiple comparisons of students’ activities by type of participation in dual credit using the Tukey post hoc test identified that students who participated in academic dual credit ($M_{\text{extra activ}} = 4.82$, $SD_{\text{extra activ}} = 3.267$) had a significantly higher mean for level of extracurricular activities than students participating in CTE dual credit ($M_{\text{extra activ}} = 2.89$, $SD_{\text{extra activ}} = 2.830$, $p < .05$). There was no significant difference between non-participants ($M_{\text{extra activ}} = 3.80$, $SD_{\text{extra activ}} = 3.942$) and participants in either CTE dual credit ($M_{\text{extra activ}} = 2.89$, $SD_{\text{extra activ}} = 2.830$) or academic dual credit ($M_{\text{extra activ}} = 4.82$, $SD_{\text{extra activ}} = 3.267$). With a possible range of values from 0 to 60 defining a number of different activities and varying levels of participation (local, regional, state, national), academic dual credit participants had a mean activities level of 4.82 compared to 2.89 of CTE dual credit participants. Non-participants had a mean extracurricular activities level equal to 3.80. Mean values between 2 and 5 among the groups could represent two to five activities at the local level or perhaps one activity at the national level. It is somewhat difficult to explain the differences between the groups in practical terms.
**GPA.** There was a significant relationship between the type of dual credit participation and the self-reported high school GPA of students represented by Brown-Forsythe \([F(2, 112.992) = 33.965, p < .001, \eta^2 = .33]\). Multiple comparisons of the mean GPA by type of participation in dual credit using the Dunnett T3 post hoc test (see Table 21) indicated that students who participated in academic dual credit \((M_{gpa} = 3.522, SD_{gpa} = .363)\) had a significantly higher mean GPA than students participating in CTE dual credit \((M_{gpa} = 2.776, SD_{gpa} = .607)\) and students who did not participate in any dual credit \((M_{gpa} = 2.919, SD_{gpa} = .521)\) as indicated by a significance level of \(p < .001\) for both comparisons. There was no significant difference between CTE participants \((M_{gpa} = 2.776, SD_{gpa} = .607)\) and non-participants \((M_{gpa} = 2.919, SD_{gpa} = .521)\). On a grade scale of 0.000 to 4.000, academic dual credit participants had a mean overall GPA (based on four core subjects in high school) equal to about a B+ whereas CTE participants and non-participants both were about B-.

**Peer influence.** A significant value \((p < .001)\) for the Levene Statistic was also found for peer influence, therefore the Brown-Forsythe \(F\)-ratio was performed. There was no significant relationship between the type of dual credit participation and the peer influence of students represented by Brown-Forsythe \([F(2, 108.008) = 2.572, p > .05]\). With a range of values from 0 to 4.0, the mean values for academic dual credit participants was 2.85, non-participants was 2.75, and CTE dual credit participants was 2.50. These values indicate that between some (2.0) and most (3.0) of the students’ friends planned to attend college.
### Table 20

*Analysis of Groups with Tukey Post Hoc Test*

<table>
<thead>
<tr>
<th>Variables</th>
<th>M</th>
<th>SD</th>
<th>Academic Dual Credit</th>
<th>CTE Dual Credit</th>
<th>Neither Academic nor CTE Dual Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Academic Dual Credit</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students’ Final senior-year aspirations</td>
<td>5.75</td>
<td>1.084</td>
<td>-----</td>
<td>.001**</td>
<td>.000***</td>
</tr>
<tr>
<td>Parents’ Expectations</td>
<td>5.81</td>
<td>.885</td>
<td>-----</td>
<td>.000***</td>
<td>.003**</td>
</tr>
<tr>
<td>Parents’ Education</td>
<td>4.61</td>
<td>1.445</td>
<td>-----</td>
<td>.000***</td>
<td>.000***</td>
</tr>
<tr>
<td>Household Income</td>
<td>72,058</td>
<td>32,590</td>
<td>-----</td>
<td>.002**</td>
<td>.000***</td>
</tr>
<tr>
<td>Extracurricular Activities</td>
<td>4.82</td>
<td>3.267</td>
<td>-----</td>
<td>.010*</td>
<td>.246</td>
</tr>
<tr>
<td><strong>CTE Dual Credit</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students’ Final senior-year aspirations</td>
<td>4.80</td>
<td>1.408</td>
<td>.001**</td>
<td>-----</td>
<td>.963</td>
</tr>
<tr>
<td>Parents’ Expectations</td>
<td>4.78</td>
<td>1.172</td>
<td>.000***</td>
<td>-----</td>
<td>.340</td>
</tr>
<tr>
<td>Parents’ Education</td>
<td>3.43</td>
<td>1.346</td>
<td>.000***</td>
<td>-----</td>
<td>1.000</td>
</tr>
<tr>
<td>Household Income</td>
<td>51,080</td>
<td>27,609</td>
<td>.002**</td>
<td>-----</td>
<td>.408</td>
</tr>
<tr>
<td>Extracurricular Activities</td>
<td>2.89</td>
<td>2.830</td>
<td>.010*</td>
<td>-----</td>
<td>.394</td>
</tr>
<tr>
<td><strong>Neither Academic nor CTE Dual Credit</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students’ Final senior-year aspirations</td>
<td>4.73</td>
<td>1.440</td>
<td>.000***</td>
<td>.963</td>
<td>-----</td>
</tr>
<tr>
<td>Parents’ Expectations</td>
<td>5.11</td>
<td>1.323</td>
<td>.003**</td>
<td>.340</td>
<td>-----</td>
</tr>
<tr>
<td>Parents’ Education</td>
<td>3.43</td>
<td>1.421</td>
<td>.000***</td>
<td>1.000</td>
<td>-----</td>
</tr>
<tr>
<td>Household Income</td>
<td>42,792</td>
<td>33,423</td>
<td>.000***</td>
<td>.408</td>
<td>-----</td>
</tr>
<tr>
<td>Extracurricular Activities</td>
<td>3.80</td>
<td>3.942</td>
<td>.246</td>
<td>.394</td>
<td>-----</td>
</tr>
</tbody>
</table>

*p < .05; **p < .01; ***p < .001.*
Table 21

Analysis of Groups with Dunnett T3 Post Hoc Test

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>Academic Dual Credit</th>
<th>CTE Dual Credit</th>
<th>Neither Academic nor CTE Dual Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPA</td>
<td>3.522</td>
<td>.363</td>
<td>----</td>
<td>.000***</td>
<td>.000***</td>
</tr>
<tr>
<td>Peer Influence</td>
<td>2.85</td>
<td>.497</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GPA</td>
<td>2.776</td>
<td>.607</td>
<td>.000***</td>
<td>----</td>
<td>.541</td>
</tr>
<tr>
<td>Peer Influence</td>
<td>2.50</td>
<td>.890</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GPA</td>
<td>2.919</td>
<td>.521</td>
<td>.000***</td>
<td>.541</td>
<td>----</td>
</tr>
<tr>
<td>Peer Influence</td>
<td>2.75</td>
<td>.887</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*\( p < .05; **p < .01; ***p < .001.\)

Summarizing the above analysis, results showed academic dual credit participants have higher mean values for final senior-year aspirations, parents’ education, parents’ expectations, household income, and GPA compared to CTE dual credit participants and non-participants. There is not a significant difference in the mean values for final senior-year aspirations of students’, parents’ expectations, parents’ education, GPA, and household income between CTE dual credit participants and non-participants. The mean value for the variable extracurricular activities is significant only between CTE dual credit participants and academic dual credit participants. The mean values of peer influence for the three groups are not significantly different.

Since differences exist in participation between white and non-white students and low income and other students, and these students are more at-risk of not attending college, a comparison between race/ethnicity and income status with variables in the college choice model...
was performed. Minority and low income students have significant differences in parents’ level of education and GPA. Parents of minority students have a mean value (M = 3.36, SD = 1.495) for parents’ education equal to some college attendance compared to white students (M = 4.16, SD = 1.475) that is equal to two or more years of college. Parents of low income students have a mean value (M= 3.31, SD = 1.378) for parents’ education equal to some college attendance compared to other income students (M = 4.26, SD = 1.494) for parents’ education equal to two or more years of college. Low income students had a significantly lower mean GPA (M = 2.92, SD = .571) compared to other income students (M = 3.25, SD = .574). Minority students had a significantly lower mean GPA (M = 2.89, SD = .619) compared to white students (M = 3.23, SD = .554). Parents’ expectations and student’s final aspirations showed no significant differences by race/ethnicity or income status. Results are shown in Table 22.

The paired samples t test was performed to identify if significant differences existed between student’s initial aspirations and student’s final aspirations. The comparisons were performed for each of the three participant groups (senior-year academic dual credit participants, senior-year CTE dual credit participants, and senior-year non-participants) and then further differentiated by gender, race/ethnicity, and income status. The results showed no significant differences between student’s initial aspirations and student’s final aspirations among all three groups overall. When differentiated by gender, race/ethnicity, and income status senior-year academic dual credit participants and senior-year academic dual credit participants did not have any significant differences between initial aspirations and final aspirations. Senior-year non-participants did exhibit significant differences between initial aspirations and final aspirations among females, non-white students, and low income students. Results are shown in Table 23 and represented as follows: Female, non-participants’ initial aspirations (M = 5.42, SD = 1.238) are
significantly higher than female, non-participants’ final aspirations (M = 4.38, SD = 1.499), t(25) = 3.188, p < .01, d = .62; Non-white, non-participants’ initial aspirations (M = 5.48, SD = 1.201) are significantly higher than non-white, non-participants’ final aspirations (M = 4.91, SD = 1.505), t(22) = 2.192, p < .05, d = .46; and low income, non-participants’ initial aspirations (M = 5.16, SD = 1.167) are significantly higher than low income, non-participants’ final aspirations (M = 4.69, SD = 1.148), t(31) = 2.897, p < .01, d = .51. These three groups within the non-participation group demonstrated a significant decrease in aspirations from the beginning of the year to the end of the year.

The correlations among variables are shown in Table 24. In general, participation in senior academic dual credit shows positive correlations with almost all variables while participation in senior CTE dual credit shows negative correlations with almost all variables. Specifically, participation in senior academic dual credit shows a moderate positive relationship with parent’s education \( r(150) = .377, p < .001 \), parent’s expectations \( r(159) = .327, p < .001 \), student’s initial senior-year \( r(159) = .362, p < .001 \) and final senior-year aspirations \( r(161) = .338, p < .001 \), total junior dual credit \( r(161) = .460, p < .001 \), and household income \( r(161) = .396, p < .001 \). A weaker positive relationship exists between participation in senior academic dual credit and peer influence \( r(156) = .174, p < .05 \). All significant relationships between participation in senior CTE dual credit and other variables (parents’ education, parents’ expectations, students’ initial and final senior-year aspirations, total junior dual credit, extracurricular activities, GPA, peer influence, and household income) are negative relationships.

From the correlation analysis it is evident that nearly all variables identified as control variables (parents’ education, parents’ expectations, student’s initial senior-year aspirations, total junior-year dual credit, extracurricular activities, GPA, peer influences, and household income)
in this study have a significant association with the dependent variable [student’s final senior-year aspirations] and therefore should be included as control variables in the regression analysis. It is important to note that correlations are not so high as to create problems with the regression analysis. Student’s final senior-year aspirations show a significant moderate positive relationship with GPA \[r(158) = .310, p < .001\] and a positive relationship with total junior dual credit \[r(161) = .199, p < .05\], extracurricular activities \[r(159) = .172, p < .05\], peer influence \[r(156) = .191, p < .05\], and household income \[r(161) = .169, p < .05\]. There is not a significant relationship between student’s final senior-year aspirations and participation in senior CTE dual credit \[r(161) = -.054, p > .05\].
Table 22

ANOVA Comparison of Race/ethnicity and Income Status with Select College Choice Variables

<table>
<thead>
<tr>
<th>Groups</th>
<th>Parents’ Ed</th>
<th>GPA</th>
<th>Parents’ Exp</th>
<th>Final Asp</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>F</td>
<td>M</td>
</tr>
<tr>
<td>White</td>
<td>4.16</td>
<td>1.475</td>
<td>9.022**</td>
<td>3.23</td>
</tr>
<tr>
<td>Non-white</td>
<td>3.36</td>
<td>1.495</td>
<td>2.89</td>
<td>.619</td>
</tr>
<tr>
<td>Low Inc</td>
<td>3.31</td>
<td>1.378</td>
<td>14.223***</td>
<td>2.92</td>
</tr>
<tr>
<td>Other</td>
<td>4.26</td>
<td>1.494</td>
<td>3.25</td>
<td>.574</td>
</tr>
</tbody>
</table>

*p < .05., **p < .01., ***p < .001.
Table 23

Mean Initial Aspirations and Mean Final Aspirations by Gender, Race/ethnicity, and Income Status by Type of Dual Credit Participation in the Senior Year

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Participation in Senior-year Academic Dual Credit</th>
<th>Participation in Senior-year CTE Dual Credit</th>
<th>Non-participation in Senior-year Dual Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Initial Aspirations</td>
<td>Final Aspirations</td>
<td>Initial Aspirations</td>
</tr>
<tr>
<td>All</td>
<td>5.89</td>
<td>5.76</td>
<td>4.94</td>
</tr>
<tr>
<td>Male</td>
<td>5.78</td>
<td>5.74</td>
<td>4.96</td>
</tr>
<tr>
<td>Female</td>
<td>5.95</td>
<td>5.78</td>
<td>4.86</td>
</tr>
<tr>
<td>White</td>
<td>5.82</td>
<td>5.71</td>
<td>4.94</td>
</tr>
<tr>
<td>Non-white</td>
<td>6.38</td>
<td>6.13</td>
<td>4.93</td>
</tr>
<tr>
<td>Low Income</td>
<td>6.11</td>
<td>6.00</td>
<td>4.85</td>
</tr>
<tr>
<td>Other</td>
<td>5.85</td>
<td>5.72</td>
<td>5.00</td>
</tr>
</tbody>
</table>

Note. Rank order variable defined as a continuous variable: 4 equates to “Receive Associate's degree (2 years)”, 5 equates to “Receive Bachelor's degree (4 years)”, 6 equates to “Obtain a Master's degree or equivalent” and 7 equates to “Obtain a Ph.D., M.D., or other advanced degree”. Significant differences between initial aspirations and final aspirations: * p < .05, ** p < .01.
## Table 24

**Pearson Correlation Table**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Parents’ Education</th>
<th>Parents’ Expectations</th>
<th>Gender [Male]</th>
<th>Race/ethnicity [White]</th>
<th>Total Junior-year Dual Credit</th>
<th>Extra curricular Activities</th>
<th>GPA</th>
<th>Peer Inf</th>
<th>H’hold Income</th>
<th>Partic Senior-year Academic Dual Credit</th>
<th>Partic Senior-year CTE Dual Credit</th>
<th>Partic in Senior-year as CTE Dual Credit</th>
<th>Student's Initial senior-year aspirations</th>
<th>Student's Final senior-year aspirations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parents’ Education</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parents’ Expectations</td>
<td></td>
<td>.342**</td>
<td>-0.054</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender [Male]</td>
<td>-0.054</td>
<td>-0.193*</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Race/ethnicity [White]</td>
<td></td>
<td>.238**</td>
<td>-0.031</td>
<td>-0.157*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Junior-year Dual Credit</td>
<td></td>
<td>.250**</td>
<td>-0.149</td>
<td>0.224**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extracurricular Activities</td>
<td></td>
<td>.100</td>
<td>-0.102</td>
<td>-0.281**</td>
<td>0.112</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GPA</td>
<td></td>
<td>.355**</td>
<td>-0.106</td>
<td>0.255**</td>
<td>0.373**</td>
<td>0.183*</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peer Influence</td>
<td></td>
<td>.195**</td>
<td>-0.268**</td>
<td>0.051</td>
<td>0.147</td>
<td>0.140</td>
<td>0.307**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Household Income</td>
<td></td>
<td>.505**</td>
<td>-0.104</td>
<td>0.308**</td>
<td>0.152</td>
<td>0.027</td>
<td>0.339**</td>
<td>0.095</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Partic in Senior-year Academic Dual</td>
<td></td>
<td>.377**</td>
<td>-0.288**</td>
<td>-0.292**</td>
<td>0.460**</td>
<td>0.229**</td>
<td>0.539**</td>
<td>0.174</td>
<td>0.396**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Partic in Senior-year CTE Dual</td>
<td></td>
<td>-0.177*</td>
<td>-0.245**</td>
<td>-0.177*</td>
<td>-0.164*</td>
<td>-0.281**</td>
<td>-0.168*</td>
<td>-0.147</td>
<td>-0.400**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Credit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student's Initial senior-year</td>
<td></td>
<td>.353**</td>
<td>-0.243**</td>
<td>-0.067</td>
<td>0.286**</td>
<td>0.292**</td>
<td>0.387**</td>
<td>0.283</td>
<td>0.148</td>
<td>0.362**</td>
<td>-0.155*</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>aspirations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student's Final senior-year aspirations</td>
<td></td>
<td>.371**</td>
<td>-0.043</td>
<td>-0.054</td>
<td>0.199*</td>
<td>0.172*</td>
<td>0.310**</td>
<td>0.191</td>
<td>0.169</td>
<td>-0.054</td>
<td>0.579**</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.05 level (2-tailed)

** Correlation is significant at the 0.01 level (2-tailed)
Research Question Two

Research question two asks about the significance of participation in dual credit as a factor in changing students’ aspirations during the senior-year while controlling for student’s initial aspirations, initial (junior-year) dual credit, student characteristics, significant others’ influence, and extracurricular activities. Prior to running this model, the data will be modeled against Hossler and Gallagher’s (1987) College Choice model, specifically Hossler and Stage’s (1992) predisposition model to assess how the current data fits their model. In Table 25, Model 1 represents the model. Model 1 \[F(8,136) = 8.553, \ p < .001, \ R^2 = .335\] is significant with all variables accounting for 34% of the variance in predicting senior final educational aspirations. Parents’ expectations and parents’ education are significant predictor variables for aspirations.

Table 25

\textit{Hossler and Stage’s (1992) Predisposition Model with Current Study Data (N = 144)}

<table>
<thead>
<tr>
<th>Variables</th>
<th>Model 1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
</tr>
<tr>
<td>Constant</td>
<td>.951</td>
</tr>
<tr>
<td>Gender [Male]</td>
<td>.112</td>
</tr>
<tr>
<td>Parents’ Education</td>
<td>.164*</td>
</tr>
<tr>
<td>Parents’ Expectations</td>
<td>.448***</td>
</tr>
<tr>
<td>Race/ethnicity [White]</td>
<td>-.283</td>
</tr>
<tr>
<td>Extracurricular Activities</td>
<td>.000</td>
</tr>
<tr>
<td>GPA</td>
<td>.345</td>
</tr>
<tr>
<td>Peer Influence</td>
<td>.109</td>
</tr>
<tr>
<td>Low Income</td>
<td>-.071</td>
</tr>
</tbody>
</table>

\[
R^2 = .34 \\
F \text{ for Model} = 8.553***
\]

*p < .05., **p < .01., ***p < .001.

In Table 26, Model 1 represents all control variables without including participation in dual credit during the senior-year. Model 1 \[F(10,134) = 10.151, \ p < .001, \ R^2 = .431\] is
significant with all variables accounting for 43% of the variance in changes to student’s senior-year educational aspirations. To specifically address research question two, Model 2 added the variables of interest, participation in senior-year academic dual credit and participation in senior-year CTE dual credit. Model 2 \(F(12,132) = 8.775, p < .001, R^2 = .444\) is significant with all variables accounting for 44% of the variance in changes to student’s final senior-year educational aspirations although the change in \(R^2\) from Model 1 to Model 2 was not significant. Neither participation in senior-year academic dual credit nor CTE dual credit is significant compared to non-participation in Model 2, meaning dual credit participation was not a significant variable in predicting a change in students’ senior-year educational aspirations while controlling for student characteristics, significant others’ influence, and extracurricular activities. The only variable of significance in Model 2 on changing students’ senior-year aspirations is students’ initial senior-year aspirations (\(B = .545, t(132) = 4.489, p < .001\)), a control variable, and this is after controlling for all other variables.
Table 26

*Regression of Participation in Senior-year Dual Credit on Changing Aspirations Controlling for Student Characteristics, Significant Others’ Influence, and Extracurricular Activities*

<table>
<thead>
<tr>
<th>Variables</th>
<th>Model 1</th>
<th></th>
<th>Model 2</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SEB</td>
<td>β</td>
<td>B</td>
<td>SEB</td>
</tr>
<tr>
<td>Constant</td>
<td>.421</td>
<td>.706</td>
<td>.534</td>
<td>.739</td>
<td></td>
</tr>
<tr>
<td>Gender [Male]</td>
<td>.291</td>
<td>.194</td>
<td>.326</td>
<td>.198</td>
<td>.120</td>
</tr>
<tr>
<td>Race/ethnicity [White]</td>
<td>-.122</td>
<td>.242</td>
<td>-.148</td>
<td>.243</td>
<td>-.049</td>
</tr>
<tr>
<td>Students’ Senior-Year Initial Asp</td>
<td>.568**</td>
<td>.121</td>
<td>.545***</td>
<td>.121</td>
<td>.493</td>
</tr>
<tr>
<td>Total Junior-Year Dual Credit</td>
<td>.000</td>
<td>.030</td>
<td>-.013</td>
<td>.031</td>
<td>-.031</td>
</tr>
<tr>
<td>Parents’ Education</td>
<td>.110</td>
<td>.070</td>
<td>.105</td>
<td>.070</td>
<td>.116</td>
</tr>
<tr>
<td>Parents’ Expectations</td>
<td>.060</td>
<td>.124</td>
<td>.076</td>
<td>.124</td>
<td>.065</td>
</tr>
<tr>
<td>Low Income</td>
<td>-.128</td>
<td>.211</td>
<td>-.048</td>
<td>.215</td>
<td>-.017</td>
</tr>
<tr>
<td>Extracurricular Activities</td>
<td>-.008</td>
<td>.030</td>
<td>-.014</td>
<td>.030</td>
<td>-.034</td>
</tr>
<tr>
<td>GPA</td>
<td>.241</td>
<td>.192</td>
<td>.158</td>
<td>.202</td>
<td>.068</td>
</tr>
<tr>
<td>Peer Influence</td>
<td>.084</td>
<td>.135</td>
<td>.088</td>
<td>.135</td>
<td>.046</td>
</tr>
<tr>
<td>Participation in Senior Academic Dual Credit</td>
<td></td>
<td></td>
<td>.426</td>
<td>.263</td>
<td>.155</td>
</tr>
<tr>
<td>Participation in Senior CTE Dual Credit</td>
<td>.268</td>
<td>.250</td>
<td>.268</td>
<td>.250</td>
<td>.078</td>
</tr>
<tr>
<td>$R^2$</td>
<td>.431</td>
<td></td>
<td>.444</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\Delta R^2$</td>
<td></td>
<td></td>
<td>.013</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$F$ for Model</td>
<td>10.15***</td>
<td></td>
<td>8.78***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$F$ for change in $R^2$</td>
<td></td>
<td></td>
<td>1.517</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* p < .05. ** p < .01. *** p < .001.
Research Questions Three, Four, Five, and Six

Research questions three, four, five, and six address similar questions about interaction effects of gender, race/ethnicity and income status with participation in senior-year dual credit. To analyze all interaction terms simultaneously and appropriately, Table 27 shows several models including different interaction terms with participation in senior-year dual credit and includes control variables. Due to a large number of variables and a limited number of complete cases \((N = 144)\) to analyze the researcher decided to analyze various models to determine the value in trimming the model.

Considering two-way interaction terms for gender (research question three) and race/ethnicity (research question four) with participation in senior-year dual credit, and based on previous aspirations research where differences existed among race and gender (i.e., African American females consistently aspire to more schooling than their white female counterparts) (Kao & Tienda, 1998), the researcher decided to include three-way interaction terms of race, gender, and participation in senior-year dual credit (research question five) to the model. The final interaction term to consider is income status and participation in senior-year dual credit (research question six). Since all the interaction terms (both two-way and three-way) need to be evaluated at the same time in the same model, Table 27, Model 3 shows this analysis.

Starting with Model 3, the model shows all two-way interaction terms with participation in senior-year dual credit, three-way interaction terms, and all control variables. It is evident from the model that although the model has a significant \(F [F(20,124) = 6.913, p < .001, R^2 = .527]\) the three-way interaction terms for gender and race/ethnicity with participation in senior-year dual credit were not significant [male X white X senior academic dual credit participation: \((B = -.681, t(124) = -.899, p > .05)\) and male X white X senior CTE dual credit participation: \((B
The addition of the three-way terms did not make a significant change to $F (2, 124) = 1.688, p > .05$ and $R^2$ change = .013 when compared to Model 2 which did not include the three-way interaction. The three-way interaction terms can be removed from the model.

Table 27, Model 2 $[F(18, 126) = 7.412, p < .001, R^2 = .514]$ was significant with all variables accounting for 51% of the variance in changing students’ senior-year aspirations. Interaction terms including gender ($p < .01$) and race/ethnicity ($p < .05$ for one interaction term) with participation in senior-year dual credit were significant to the model but income status with participation in senior-year dual credit interaction terms were not significant [low income X senior academic dual credit participation: ($B = .362, t(126) = .749, p > .05$) and low income X senior CTE dual credit participation: ($B = .283, t(126) = .546, p > .05$)]. The addition of the income status and participation in senior-year dual credit interaction terms did not make a significant change to $F (2, 126) = .329, p > .05$ and $R^2$ change = .003 when compared to Model 1 which did not include the income status and participation in senior-year dual credit interaction terms. In an effort to increase degrees of freedom and therefore improve precision to the model, the model reflecting interaction terms was trimmed to include only interaction terms for gender with participation in senior-year dual credit, and race/ethnicity with participation in senior-year dual credit (Model 1). The income status and participation in senior-year dual credit interaction terms can be removed from the model.

Research questions three (interaction terms for gender and participation in senior-year dual credit) and four (interaction terms for race/ethnicity and participation in senior-year dual credit) ask about the interaction effects of gender and race/ethnicity with participation in senior-year dual credit on changing student’s senior-year aspirations while controlling for student’s
initial aspirations, initial (junior-year) dual credit, student characteristics, significant others’
influence, and extracurricular activities. In order to address research questions three and four that
involve the interaction terms for gender and race/ethnicity with participation in senior-year dual
credit, hierarchical linear regression results are shown in Table 28. Model 1 was included to
evaluate the effect in Model 2 with the addition of participation in senior-year dual credit. Model
2 \[ F(12,132) = 8.775, p < .001, R^2 = .444 \] was significant with the addition of the participation
variable but the change in \( R^2 \) from Model 1 was not significant \[ F(2,132) = 1.507, p > .05 \]. The
only significant variable in the model was students’ initial senior-year aspirations (\( B = .545, 
 t(132) = 4.489, p < .001 \)). Models 1 and 2 are duplicated from Table 26 and were evaluated in
response to research question two. It was previously determined that participation was not
significant to Model 2.

Model 3 \[ F(16,128) = 8.386, p < .001, R^2 = .512 \] was significant and with the addition of the interaction terms, the \( F \) change \( (F(4,128) = 4.459, p < .01) \) for Model 3 was also significant. The variables for participation in senior-year academic dual credit (\( B = 1.282, t(128) = 2.771, p < .01 \)) and participation in senior-year CTE dual credit (\( B = 2.111, t(128) = 3.768, p < .001 \)) were
significant to Model 3 with the addition of the interaction terms. Comparing Model 3 results to
Model 2 it is evident that the effect of participation in senior-year dual credit was masked
without the inclusion of the interaction terms. Three of the four interaction terms are significant
to the model: male X participation in senior-year academic dual credit (\( B = -1.298, t(128) = -3.174, p < .01 \)), male X participation in senior-year CTE dual credit (\( B = -1.479, t(128) = -2.692, p < .01 \)) and white X participation in senior-year CTE dual credit (\( B = -1.268, t(128) = -2.443, p < .05 \)). The interaction term white X participation in senior-year academic dual credit was not
significant (\( B = -.486, t(128) = -1.083, p > .05 \)). Control variables in Model 3 that were
significant included male (B = 1.177, \( t(128) = 3.894, p < .001 \)), student’s initial senior-year aspirations (B = .651, \( t(128) = 5.397, p < .001 \)), and parents’ education (B = .137, \( t(128) = 2.021, p < .05 \)).
### Table 27

Regression of Participation in Senior-year Dual Credit on Changing Aspirations Controlling for Student Characteristics, Significant Others’ Influence, Extracurricular Activities, Two-way and Three-way Interaction Terms

<table>
<thead>
<tr>
<th>Variables</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SEB</td>
<td>β</td>
</tr>
<tr>
<td>Constant</td>
<td>-1.532</td>
<td>.873</td>
<td></td>
</tr>
<tr>
<td>Gender [Male]</td>
<td>1.177***</td>
<td>.302</td>
<td>.433</td>
</tr>
<tr>
<td>Race/ethnicity [White]</td>
<td>.436</td>
<td>.322</td>
<td>.143</td>
</tr>
<tr>
<td>Students’ Senior-Year Initial Asp</td>
<td>.651***</td>
<td>.121</td>
<td>.588</td>
</tr>
<tr>
<td>Total Junior-Year Dual Credit</td>
<td>-.026</td>
<td>.030</td>
<td>-.064</td>
</tr>
<tr>
<td>Parents’ Education</td>
<td>.137*</td>
<td>.068</td>
<td>.151</td>
</tr>
<tr>
<td>Parents’ Expectations</td>
<td>.056</td>
<td>.120</td>
<td>.048</td>
</tr>
<tr>
<td>Low Income</td>
<td>.152</td>
<td>.210</td>
<td>.053</td>
</tr>
<tr>
<td>Extracurricular Activities</td>
<td>.000</td>
<td>.029</td>
<td>-.001</td>
</tr>
<tr>
<td>GPA</td>
<td>.222</td>
<td>.197</td>
<td>.095</td>
</tr>
<tr>
<td>Peer Influence</td>
<td>.202</td>
<td>.132</td>
<td>.106</td>
</tr>
<tr>
<td>Participation in Senior Academic Dual Credit</td>
<td>1.282***</td>
<td>.463</td>
<td>.467</td>
</tr>
<tr>
<td>Participation in Senior CTE Dual Credit</td>
<td>2.111***</td>
<td>.560</td>
<td>.615</td>
</tr>
<tr>
<td>Male_Participation in Senior Academic Dual</td>
<td>-1.298**</td>
<td>.409</td>
<td>-.337</td>
</tr>
<tr>
<td>Male_Participation in Senior CTE Dual Credit</td>
<td>-1.479**</td>
<td>.549</td>
<td>-.384</td>
</tr>
<tr>
<td>White_Participation in Senior Academic Dual</td>
<td>-.486</td>
<td>.449</td>
<td>-.172</td>
</tr>
<tr>
<td>White_Participation in Senior CTE Dual Credit</td>
<td>-1.268*</td>
<td>.519</td>
<td>-.301</td>
</tr>
</tbody>
</table>

(continued)
Table 27 (continued)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Model 1</th>
<th></th>
<th></th>
<th>Model 2</th>
<th></th>
<th></th>
<th>Model 3</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SEB</td>
<td>β</td>
<td>B</td>
<td>SEB</td>
<td>β</td>
<td>B</td>
<td>SEB</td>
<td>β</td>
</tr>
<tr>
<td>Low Income_Partic in Senior Academic Dual</td>
<td>.362</td>
<td>.483</td>
<td>.064</td>
<td>.318</td>
<td>.483</td>
<td>.057</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Income_Partic in Senior CTE Dual Credit</td>
<td>.283</td>
<td>.517</td>
<td>.055</td>
<td>.193</td>
<td>.517</td>
<td>.038</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White_Male_Partic Senior Academic Dual Credit</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td>-.681</td>
<td>.757</td>
<td>-.162</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White_Male_Partic Senior CTE Dual Credit</td>
<td>-1.450</td>
<td>.911</td>
<td>-.306</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$R^2$</td>
<td>.512</td>
<td></td>
<td></td>
<td>.514</td>
<td></td>
<td>.527</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\Delta R^2$</td>
<td>.003</td>
<td></td>
<td></td>
<td>.013</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$F$ for Model</td>
<td>8.386***</td>
<td></td>
<td></td>
<td>7.412***</td>
<td></td>
<td>.329</td>
<td>6.913***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$F$ for change in $R^2$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.329</td>
<td></td>
<td>1.688</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* $p < .05$. ** $p < .01$. *** $p < .001$. 
Table 28

Regression of Participation in Senior-year Dual Credit on Changing Aspirations Controlling for Student Characteristics, Significant Others’ Influence, Extracurricular Activities, and Two-way Interaction Terms

<table>
<thead>
<tr>
<th>Variables</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variables</td>
<td>B</td>
<td>SEB</td>
<td>β</td>
</tr>
<tr>
<td>Constant</td>
<td>.421</td>
<td>.706</td>
<td>.534</td>
</tr>
<tr>
<td>Gender [Male]</td>
<td>.291</td>
<td>.194</td>
<td>.107</td>
</tr>
<tr>
<td>Race/ethnicity [White]</td>
<td>-.122</td>
<td>.242</td>
<td>-.040</td>
</tr>
<tr>
<td>Students’ Senior-Year Initial Asp</td>
<td>.568***</td>
<td>.121</td>
<td>.514</td>
</tr>
<tr>
<td>Total Junior-year Dual Credit</td>
<td>.000</td>
<td>.030</td>
<td>.001</td>
</tr>
<tr>
<td>Parents’ Education</td>
<td>.110</td>
<td>.070</td>
<td>.121</td>
</tr>
<tr>
<td>Parents’ Expectations</td>
<td>.060</td>
<td>.124</td>
<td>.052</td>
</tr>
<tr>
<td>Low Income</td>
<td>-.128</td>
<td>.211</td>
<td>-.045</td>
</tr>
<tr>
<td>Extracurricular Activities</td>
<td>-.008</td>
<td>.030</td>
<td>-.019</td>
</tr>
<tr>
<td>GPA</td>
<td>.241</td>
<td>.192</td>
<td>.103</td>
</tr>
<tr>
<td>Peer Influence</td>
<td>.084</td>
<td>.135</td>
<td>.044</td>
</tr>
<tr>
<td>Participation in Senior Academic Dual Credit</td>
<td>.426</td>
<td>.263</td>
<td>.155</td>
</tr>
<tr>
<td>Participation in Senior CTE Dual Credit</td>
<td>.268</td>
<td>.250</td>
<td>.078</td>
</tr>
<tr>
<td>Male_Participation in Senior Academic Dual Credit</td>
<td>-1.298**</td>
<td>.409</td>
<td>-.337</td>
</tr>
<tr>
<td>Male_Participation in Senior CTE Dual Credit</td>
<td>-1.479**</td>
<td>.549</td>
<td>-.384</td>
</tr>
<tr>
<td>White_Participation in Senior Academic Dual Credit</td>
<td>-.486</td>
<td>.449</td>
<td>-.172</td>
</tr>
<tr>
<td>White_Participation in Senior CTE Dual Credit</td>
<td>-1.268*</td>
<td>.519</td>
<td>-.301</td>
</tr>
</tbody>
</table>

\[
\begin{align*}
R^2 & = .431 \\
\Delta R^2 & = .013 \\
F \text{ for Model} & = 10.151*** \\
F \text{ for change in } R^2 & = 1.507
\end{align*}
\]

* p < .05. ** p < .01. *** p < .001
Table 29 shows the effects of gender and participation in senior-year dual credit assuming all other variables are held constant. The effect of gender equal to male with participation in senior-year academic dual credit was 1.161. The effect of gender equal to male with participation in senior-year CTE dual credit was 1.809. The effect of gender equal to female with participation in senior-year academic dual credit was 1.282. The effect of gender equal to female with participation in senior-year CTE dual credit was 2.111. Assuming all other control variables are held constant, females participating in senior-year CTE dual credit have a small advantage over males participating in senior-year CTE dual credit in changing their senior-year aspirations. Males participating in academic dual credit will see a change similar to males who do not participate in any dual credit whereas participation in CTE dual credit will increase aspirations. Females participating in senior-year CTE dual credit will experience a larger increase in aspirations compared to females participating in senior-year academic dual credit. Participation in either senior-year academic or CTE dual credit would bring females closer to an equal playing field compared to males who have an advantage even if they do not participate in either type of dual credit.

Table 29

*Total Effects of Gender (Main Effects and Interaction Effects) and Participation in Senior-Year Dual Credit on Changing Senior-year Aspirations*

<table>
<thead>
<tr>
<th>Gender</th>
<th>Academic Dual Credit</th>
<th>CTE Dual Credit</th>
<th>Non-participation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>1.161</td>
<td>1.809</td>
<td>1.177</td>
</tr>
<tr>
<td>Female</td>
<td>1.282</td>
<td>2.111</td>
<td>0</td>
</tr>
</tbody>
</table>

*Note.* Data from Table 28, Model 3
Table 30 shows the effects of race/ethnicity and participation in senior-year dual credit assuming all other variables are held constant. The effect of race/ethnicity equal to white with participation in senior-year academic dual credit was 1.232. The effect of race/ethnicity equal to white with participation in senior-year CTE dual credit was 1.279. The effect of race/ethnicity equal to non-white with participation in senior-year academic dual credit was 1.282. The effect of race/ethnicity equal to non-white with participation in senior-year CTE dual credit was 2.111. Assuming all other control variables are held constant, non-white students participating in senior-year CTE dual credit have an advantage over white students participating in senior-year CTE dual credit in changing their senior-year aspirations. Participation in academic dual credit provides somewhat of an equal advantage in changing aspirations in both white and non-white participants. White, non-participants have a small advantage over non-white, non-participants in changing aspirations.

Table 30

*Total Effects of Race/ethnicity (Main Effects and Interaction Effects) and Participation in Senior-Year Dual Credit on Changing Senior-year Aspirations*

<table>
<thead>
<tr>
<th>Race/ethnicity</th>
<th>Senior-year Participation in Dual Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Academic Dual Credit</td>
</tr>
<tr>
<td>White</td>
<td>1.232</td>
</tr>
<tr>
<td>Non-white</td>
<td>1.282</td>
</tr>
</tbody>
</table>

*Note.* Data from Table 28, Model 3
Chapter 5

Summary, Conclusions, Implications, and Recommendations

This study was designed to understand the type of students participating in dual credit and to look at the impact of participation in dual credit on changing the educational aspirations of high school seniors. This chapter provides a summary of the study, a discussion of the major findings of the research, conclusions and implications, and recommendations for future research and for improving institutional practices.

Summary of the Study

Researchers have examined the college decision-making process and identified variables that influence students’ aspirations to continue their postsecondary education after high school. These variables include academic, economic, social, family, and demographic factors. Researchers have studied why students fail to attend college from various perspectives, i.e., economic (Kotler & Fox, 1985), social (Karabel & Astin, 1975), and academic (Kolstad, 1979), and many observe that the presence of educational aspirations is an important first step in the decision-making process to attend college (Choy et al., 2000; Hanson, 1994; Hossler & Gallagher, 1987; Hossler et al., 1999).

According to Hossler and Gallagher’s (1987) model of college choice, student characteristics (race/ethnicity, academic ability, gender), significant others’ influence (parents’ education, parents’ expectations, peer influence, SES), and extracurricular activities (athletics, student government, yearbook, and others) relate to students’ educational aspirations. Many of these factors are ascribed and others may be determined early in the students’ educational career. In fact, students begin to formalize educational aspirations during the ninth or tenth grades (Hossler & Stage, 1987), suggesting interventions occurring early in students’ high school
careers may be able to influence their educational aspirations. Identifying opportunities for changing aspirations late in the decision making process as well as those variables that have the capacity to change aspirations will be important for high schools, parents, and students.

**Overview of the research.** Using Hossler and Gallagher’s (1987) college choice model and focusing on the predisposition phase (Hossler & Stage, 1992), the researcher looked at those variables known to impact aspirations and added participation in senior-year dual credit to the model. The current research relied on quantitative data collection to answer the six research questions that guided this study. Data was collected from high school seniors using two student surveys, one at the beginning of the senior-year and one at the end of the senior-year. Data was also obtained from the community college responsible for providing the credit for courses available at the high school. Multiple linear regression and the significance of interaction terms for gender, race/ethnicity, and income status with participation in senior-year dual credit were studied. Two-way and three-way interaction terms were analyzed. Control variables included the variables known to be significant to college choice models and also included initial student aspirations and participation in dual credit during the junior-year in high school.

Based on the results of 163 high school seniors from two surveys and data collected from a community college, it was determined that female and non-white students would benefit the most compared to males and white students by participating in CTE dual credit during the senior year in high school by increasing educational aspirations while controlling for other variables. This finding was identified as a result of analyzing the data for interaction effects of participation in dual credit with the variables gender and race/ethnicity through multiple linear regression analysis and controlling variables associated with the college decision making process.
This study adds to the literature on college choice and educational aspirations by investigating the relationship between participation in dual credit and changing the educational aspirations of high school senior students.

Major Findings and Discussion

This study used high school student survey data and community college data (completed credit hours) to understand the characteristics of high school students who participated in academic dual credit or CTE dual credit and of those students who did not participate in dual credit. Using multiple regression analysis and Hossler and Gallagher’s Model of College Choice (1987), the variable representing type of participation in dual credit was added to the model to determine its influence on students’ changing educational aspirations during their senior year in high school. The researcher was also interested in studying interaction effects of gender, race/ethnicity, and income status with participation in senior-year dual credit. A discussion of the major findings is categorized as follows: (a) population and sample, (b) participation and student characteristics, and (c) type of participation and gender, race/ethnicity, and income status, (d) student characteristics and type of participation, and (e) changing aspirations.

Population and sample. The research sample is 55% male, 45% female, 71% white, and 29% non-white. Thirty-four percent of the sample was considered low income. Comparing the population with the research sample shows sample gender and race/ethnicity distributions are comparable to the population. There is however a discrepancy with the distribution of low income students between the population and the sample. The value representing the population is representative of the entire high school (ninth through twelfth grade) and not just the senior class. This could be one problem with the comparison. The researcher compared the population with
the first group following instrument #1 completion, which represented 54% of the senior class, and there was a discrepancy at this time as well. The researcher believes the method of data collection and reporting between the population and sample is not consistent enough to draw accurate conclusions about the comparability of the population and sample when referring to income status. The researcher’s methodology has not been validated or determined to be reliable. When comparing gender and race/ethnicity in the sample and population, two variables with less chance for differences in definition, the population and the sample are comparable. The researcher will assume inconsistent measures were the cause of the concern with income status and consider the sampling otherwise acceptable.

**Participation and student characteristics.** Breakdown of the sample was 42% participating in academic dual credit, 28% participating in CTE dual credit, and 30% who were non-participants, therefore 60% of participants were enrolled in academic dual credit. Comparing results with national enrollments, dual credit enrollments with an academic focus accounted for about two-thirds of all dual credit enrollments in public high schools (National Center for Education Statistics, 2003). Current state level data from fiscal year 2009 shows 51% of dual credit participants were enrolled in academic dual credit (Central Midwest Community College Board, 2010c). National level data (66% academic dual credit) is data from an earlier time frame (academic year 2002-2003). Based on this research study with a 60% academic dual credit participation rate and using Chi-square goodness of fit tests, the sample results are not significantly different from state and national levels. Therefore, offerings at the high school site are consistent with state and national levels of participation.

At the state level, nearly equal proportions of females and males are participating in dual credit (50.2% and 49.8% respectively) (Midwest Area Board of Education, 2009). In the research
sample, overall 70% of the students participated in dual credit, and of the dual credit participants 55% were male and 45% were female. A Chi-square goodness of fit test between gender in the research sample and at the state level shows there was not a significant difference between the two groups. Gender mix is consistent with state levels of dual credit participation by gender. In another study, Karp et al. found 62% of dual credit participants in the Florida sample were female and 38% of the dual credit participants were male. Karp et al.’s female participation rate was significantly higher than this study’s level of participation for females.

In the current study, 76% of white students participated in dual credit. Similar results were found by Karp et al (2007). They found that 76% of white students were dual credit participants in the Florida sample, both academic and CTE. Minority students made up 24% of the sample. Both studies demonstrated less representation among minorities.

Low income students participate at similar rates when comparing the current study (24%) with the Florida sample from Karp et al. (23%). It is evident that inequities exist among low income students since participation among minorities is less than 25%. Since Karp et al. found participation in dual credit related to positive outcomes in postsecondary education understanding barriers to dual credit participation might explain lower postsecondary enrollment. Immediate enrollment in postsecondary institutions following high school graduation continues to show gaps for first generation students, low income students, and minority students (Aud et al., 2010). Table 31 summarizes the results of the comparisons by gender, race/ethnicity, and income status.
Table 31

*Study Comparison of Participation in Dual Credit by Gender, Race/ethnicity, and Income Status*

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Current Study</th>
<th>State Data: Central Midwest Community College Board (2010)*</th>
<th>Karp et al. (2007) Florida Sample**</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>163</td>
<td>75,989 (100%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>299,685 (12%)</td>
</tr>
<tr>
<td>Total Number</td>
<td>163</td>
<td>75,989</td>
<td>299,685</td>
</tr>
<tr>
<td>Participants</td>
<td>114 (70%)</td>
<td>75,989 (100%)</td>
<td>36,214 (12%)</td>
</tr>
<tr>
<td>% Participating</td>
<td>55%</td>
<td>50%</td>
<td>38%</td>
</tr>
<tr>
<td>in dual credit</td>
<td>45%</td>
<td>45%</td>
<td>62%</td>
</tr>
<tr>
<td>Male</td>
<td>76%</td>
<td>79%</td>
<td>76%</td>
</tr>
<tr>
<td>Female</td>
<td>24%</td>
<td>21%</td>
<td>24%</td>
</tr>
<tr>
<td>White</td>
<td>24%</td>
<td>NA</td>
<td>23%</td>
</tr>
<tr>
<td>Non-white</td>
<td>76%</td>
<td>NA</td>
<td>77%</td>
</tr>
<tr>
<td>Low Income</td>
<td>76%</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>76%</td>
<td>NA</td>
<td></td>
</tr>
</tbody>
</table>

Note. NA = not available.


Questions about access come to light regarding low income students and minority students and their lack of participation in dual credit. There could be several reasons for their lack of participation which may include a lack of college knowledge (Venezia et al., 2003) and academic preparation. College knowledge is defined as what people know about how to prepare
for college, college admissions, and placement policies (Venezia et al., 2003, p. 28). The cost to participate was not a factor at the research site because the associated community college did not charge any tuition or fees. The fact that both non-white students and low income students had parents with significantly lower levels of education compared to white students and other income students may indicate a possible lack of college knowledge.

**Type of participation and gender, race/ethnicity, and income status.** When looking at participation in dual credit versus non-participation there were differences in race/ethnicity and income status. White students participated in dual credit more than non-white students. Low income students participated in dual credit at a lower rate than other income students. There was no significant difference in gender. When comparing participation by type of dual credit (academic dual credit, CTE dual credit, or non-participation) there were significant differences in gender and race/ethnicity between participation groups. Females participated significantly more in academic dual credit compared to males, and males participated in CTE dual credit significantly more than females. Significantly more non-white students participated in CTE dual credit than academic dual credit. Low income students were more likely to be non-participants compared to other income students, who were more likely to participate in academic dual credit.

**Student characteristics and type of participation.** Academic dual credit participants had mean values representing higher final senior-year aspirations, higher parents’ expectations, higher parents’ education, higher GPA, and higher household income compared to CTE dual credit participants and non-participants. There was not a significant difference in the mean values for final senior-year aspirations of students, parents’ expectations, parents’ education, GPA, and household income between CTE dual credit participants and non-participants. The mean value for the variable extracurricular activities was significantly different between CTE dual credit
participants and academic dual credit participants representing a higher mean value. There was no significant difference in the mean value for extracurricular activities between non-participants and academic dual credit participants and between non-participants and CTE dual credit participants. The difference in mean values for peer influence between all groups was not significantly different with all representing a value consistent with some friends to most friends attending college.

These results provide support for Hossler and Stage’s (1992) model for the predisposition phase showing higher mean values for predictor variables represent higher mean values on final aspirations. Hossler and Stage’s (1992) focus on the predisposition phase led to the identification of the direct effects of parents’ expectations, GPA, gender, and high school activities on student’s aspirations. Hossler and Stage found parents’ education had significant direct and indirect effects on aspirations. They also found parents’ education and parents’ expectations had the most influence on student’s aspirations. Using the data from the current research, Hossler and Stage’s model was tested (see Table 25). The researcher found that both parents’ education and parents’ expectations were significant predictors of student’s final aspirations. Gender, GPA, and extracurricular activities were not significant with the researcher’s data. Differences in predictors may be related to the age of the participants and how the variable GPA was defined. Hossler and Stage studied ninth graders and this study included high school senior students. Hossler and Stage used a self-reported overall GPA for ninth graders. This study used an overall GPA that was calculated using the average grade (over four years from 9th to 12th grade) for each of the four core subjects.

Correlation analysis showed that participation in academic dual credit was positively related to those variables important to the college decision making process whereas CTE dual
credit participation was negatively associated with those variables important to the college decision making process. For this study, the impact might be seen in aspirations which may then ultimately impact college attendance.

**Changing aspirations.** The purpose of the current research was to analyze changing aspirations. Aspirations in the predisposition phase are considered to be developing and are considered stable or increasing in the search and choice phases (Hossler et al., 1999). In order to identify changing aspirations, the use of initial aspirations as a control variable was necessary. Previous studies have identified differences in the development of aspirations by gender (Chenoweth & Galliher, 2004; Marini & Greenberger, 1978) and by race/ethnicity (Kerckhoff & Campbell, 1977; Perna, 2000a). Many researchers identified interactions with both gender and race/ethnicity (Hamrick & Stage, 1998; Kao & Tienda, 1998; Mau & Bikos, 2000) but this study did not find significant results with three-way interaction terms (race/ethnicity and gender) with participation in dual credit. Future research with enough cases to ensure statistical power may yield different results. The following variables in the model were significant: (a) gender, (b) parents’ education, (c) initial aspirations, (d) participation in senior-year dual credit, both academic and CTE, (e) interaction of gender and participation in senior-year dual credit interaction terms, and (f) interaction of race/ethnicity and participation in senior-year dual credit (CTE dual credit) interaction term. The interaction term for race/ethnicity and participation in senior-year academic dual credit was not significant to the model suggesting that participation in senior-year academic dual credit had the same effect on changes in aspirations for white or non-white students.

Using stepwise regression analysis, results showed that initial aspirations represented nearly 40% of the variance in changing students’ aspirations. Adding in parents’ education
brought the total to 42%. When evaluating the full model, parents’ education became a significant variable with the addition of the interaction terms and participation in dual credit. Parents’ education has been shown to be a significant variable in determining students’ aspirations (Horn & Nuñez, 2000; Hossler et al., 1989; Hossler et al., 1999; Kahl, 1953) and similar findings in this study show parents’ education was significantly related to positive changes in the aspirations of students in their senior year and participating in dual credit while controlling for student characteristics, significant others’ influence, junior-year dual credit completed, and extracurricular activities. Parental education had a direct effect on the college aspirations of ninth grade students and an even greater impact on actualization of students’ college plans, based on studies by Hossler et al. (1999) and Hossler and Stage (1992). The influence of parents’ education on raising student aspirations in the senior-year confirms the importance of parents’ education in the development of aspirations and shows the influence is persistent throughout the high school experience.

Overall the full model (Table 28) had a significant $F$ value and accounted for 51% of the variance associated with changing students’ senior-year aspirations. Students’ initial aspirations accounted for most of the variance in the model. Comparing this variance to the model with only the control variables (43%) there was an 8% variance increase when participation in dual credit and its interactions were included. The model representing the addition of the interaction terms with gender and participation in senior-year dual credit and race/ethnicity and participation in senior-year dual credit brought to light the significance of participation in dual credit and that participation may change students’ senior-year aspirations.

This study confirms that for some students, aspirations may change during the senior-year in high school. Female students and non-white students participating in senior-year CTE
dual credit seem to experience the largest benefit of change in their aspirations compared to males and white students. All students (both female and male, and white and non-white) who participate in senior-year academic dual credit experience similar increases in aspirations when holding all other variables constant. Since participants in academic dual credit have higher aspirations there might be the potential for a ceiling effect, thereby limiting the opportunity for measuring a larger change in aspirations. Females experience an increase in aspirations when participating in any senior-year dual credit compared to non-participants, whereas males benefit in increasing aspirations even without participation. Females need to participate in any dual credit to just to ensure a level playing field with males in increasing aspirations. The gender gap identified by the benefit of simply being male for non-participants implies that females need to participate in any kind of dual credit to have the same opportunities for potentially raising educational aspirations or else be disadvantaged if they do not to participate.

Karp et al. found male and low income students benefited the most from participation in dual credit in the Florida sample but found no gender differences in the CUNY sample. Analyzing income status was not possible in the CUNY sample. This research identified the most benefit to female and non-white students participating in CTE. Gender differences to consider might include the dependent variables identified in the study. Karp et al. used demonstrated behaviors (high school graduation, enrollment in college, GPA, credits earned to name a few). They did not have a measure of student motivation. This research was measuring a change in motivation or aspirations which is not a tangible, demonstrated behavior. Even though aspirations are correlated with college enrollment, we know from past experience that only about 58% of high school graduates enroll in college (Ewell, Jones, & Kelly, 2003). It is also interesting to note Karp et al., in the Florida sample, had large percentage of female participants
in both overall dual credit as well as CTE dual credit. It would be interesting to know what CTE programs existed and what percentage of females were enrolled in non-traditional fields of study.

**Conclusions and Implications**

The social and personal benefits of higher education (Desrochers, 2006) along with the demands of the knowledge economy requiring education and training beyond high school (Hunt Jr., 2006) should be enough encouragement to send every high school student to postsecondary education. Yet, according to Ewell et al. (2003), for every 100 students entering ninth grade, only 67 students graduate from high school within four years and of these 67 students only 38 continue on to postsecondary education. The first two steps of a five step educational pipeline defined by Choy et al. (2000) include aspiration development and academic preparation. These two steps account for the biggest loss in the educational pipeline. As a result, efforts to address this loss could prove most beneficial to the educational outcomes of students.

Recent growth in dual credit programs across the nation has stimulated interest and research in various types of credit-based transition programs. Dual credit programs provide academic rigor, motivation through challenging and interesting coursework, and set high expectations for students (Bailey & Karp, 2003; Karp et al., 2007; Venezia et al., 2003) addressing the first two steps of the educational pipeline. It is therefore important to investigate dual credit educational programs/opportunities and identify who participates in these programs and how participation relates to educational aspirations. An additional benefit of dual credit programs is the opportunity for students of all academic abilities to participate through academic dual credit and/or CTE dual credit (Karp et al., 2007).
Participation in dual credit. The results identifying participation in dual credit suggest that gender, race, and income status continue to play a role in participation in dual credit.

Researchers focus on several aspects of college preparation and success including: (a) information for students, parents, and educators regarding access to rigorous courses that prepare students for college (Bailey & Karp, 2003; Venezia et al., 2003), (b) informing students not only about access to college but success in college and focusing efforts on broad access college and universities attended by the vast majority of students (Venezia et al., 2003), and (c) using credit-based transition programs to improve students’ motivation through challenging and interesting opportunities, and high expectations (Karp et al., 2007; Venezia et al., 2003). These reform efforts tie nicely with the goals of dual credit programs. And in meeting the desire to reach more students, dual credit programs are commonly associated with community colleges. Dual credit programs are associated with 98% of public 2-year institutions offering courses to high school students for college credit (Kleiner & Lewis, 2005).

Dual credit programs are generally provided to high school junior and senior students (Karp et al., 2004; Karp et al., 2007). This time in a high school students’ life is the point where many decisions regarding postsecondary education are being examined. Students are making decisions about coursework and searching for opportunities that will benefit them in the long-term. The gap representing high school completion and college readiness has been identified and may be due to a variety of reasons. Venezia et al. (2003) note the curricular disjunction between K-12 institutions and postsecondary institutions and many are created as a result of policy, lack of data systems, lack of knowledge about college requirements by students and teachers, and misaligned assessment requirements. In an effort to ensure the gap does not negatively impact postsecondary attendance or success, many high schools have provided dual credit programs.
The opportunity for students of all academic levels to participate in dual credit is important including those students in CTE programs (Karp et al., 2007). Nationally, two-thirds of all dual credit classes are considered academic, transfer courses with only one-third of the offerings considered CTE (Kleiner & Lewis, 2005). In the state where this research was conducted there is more of an equal mix of academic and CTE dual credit courses with 51% considered academic and 49% considered CTE (Central Midwest Community College Board, 2010b). Efforts at the state level should ensure access to students of all academic levels by reducing barriers to participation.

In 2002-2003, 5% of high school students participated in high school dual credit (Kleiner & Lewis, 2005). And nearly a decade later, interest and participation has continued to grow. The state has seen a tremendous growth in dual credit opportunities over the past five years. There has been nearly a 13% increase in course offerings from 2008 to 2009 and a 15% increase in enrollments over the same time frame. The change in course offerings and enrollments from 2004 to 2009 represented a 71% increase course offerings and a 94% increase in enrollments statewide. The research site provided 18 classes with an academic focus and 20 classes with a CTE focus providing a somewhat equal opportunity for all students to participate. An advantage to selecting an academic focused dual credit program is the ability to select courses somewhat independent of each other (general education coursework), whereas CTE courses may be sequenced and prevent selecting courses independent of each other and limiting the number of courses a student is allowed to participate in each year. Barriers to participation usually include cost and academic eligibility (Kleiner & Lewis, 2005). The research site did not have any costs associated with participation in dual credit, but both academic and CTE dual credit courses had minimum academic eligibility requirements in order to participate.
The development of aspirations is the beginning step in the college decision making process with search and choice completing the steps of the decision making model. Unfortunately for the student, acceptance into college is not always the hardest step but being successful in college requires much more from the student for a much longer time frame (Venezia et al., 2003). This continuum of aspirations through completion of a postsecondary degree must be looked at as a sequence of events that build upon one another. Karp et al. (2007) found that participation in dual credit provided short-term, as well as long-term benefits in postsecondary success. Karp et al. (2007) found dual credit opportunities were a useful strategy for postsecondary success beginning with high school graduation. In their Florida study, Karp et al. found that male and low income dual credit participants were more likely than their peers to graduate from high school, enroll in college, enroll full-time, persist past the first year, and generate a higher GPA. So even as Karp et al. looked at the sequence of events from graduation through persistence in postsecondary education, she also looked at what the student participated in during the high school years to get to that point.

The current study focused on a short-term outcome defined as a change in aspirations. The importance of studying aspirations is the relationship between aspirations and postsecondary attendance (Sewell et al., 1970; Sewell et al., 1969; K. Wilson & Portes, 1975). Using Hossler and Gallagher’s model (1987) and focusing on Hossler and Stage’s (1992) predisposition phase the researcher evaluated the impact of participation in dual credit on changing students’ aspirations during the senior year of high school. The results of this research showed that the benefit of participation in dual credit (and its interaction terms) added 8% of the variance to the model in possibly experiencing a change in senior-year aspirations. These results suggest the importance of ensuring all students have the opportunity to participate in dual credit.
Participation of students in dual credit courses at the state level is equal among males and females. This research showed that 70% of the students participated in dual credit during their junior or senior years in high school with males and females being equally represented. But according to this research and others (Central Midwest Community College Board, 2010b; Karp et al., 2007), participation among non-white students and low income students is significantly lower compared to white students and other income students. This is indicative of more affluent students taking advantage of opportunities for advancement while the less advantaged continue to be disadvantaged. As Museus, Lutovksky and Colbeck (2007) note, “While dual enrollment programs hold great promise for increasing postsecondary educational opportunity, they also have the potential to exacerbate persisting inequities in college access” (p. 6). Access to opportunities and recognizing barriers to participation are important to growing dual credit programs and ensuring equal access to participation.

**Type of participation and changing aspirations.** Based on the comparisons of the students by type of dual credit participation, results suggest that student characteristics vary among the dual credit participation groups and also suggest senior-year participation in dual credit seems to change aspirations during the senior year in high school. Comparing students who participate in academic dual credit, CTE dual credit, and those who do not participate can provide some information about their backgrounds, educational experiences, and college aspirations. Aspirations are an important step in the college decision making process (Hossler & Gallagher, 1987; Hossler et al., 1999; Hossler & Stage, 1992) and along with the college decision making process is the importance of access to and success in college (Venezia et al., 2003). Venezia et al. found that 88% of eighth graders in their study intended to attend some form of postsecondary education. But prior to the development of aspirations, there are a number
of factors, some ascribed, some related to socioeconomic factors, and some academically focused, that play a role in the development of aspirations (Hearn, 1984).

Researchers have studied the economic factors (Kotler & Fox, 1985) that impact aspirations and ultimately college attendance but have also tried to identify those social and cultural aspects as well (Chapman, 1981; Hossler & Gallagher, 1987). Perna (2000a) attempted to add to the econometric college choice model by adding social and cultural capital to the model. These variables are thought to “reflect differences in expectations, preferences, tastes, and certainty about higher education investment decisions” (Perna, 2000a, p. 119). This research included similar variables that Perna defined as components of her social and cultural variables. These included parents’ education and expectations, and peer influence. Along with other variables (teacher encouragement, assistance from high school personnel, test preparation, and student’s expectations) assigned as proxies for social and cultural capital, Perna found that social and cultural capital adds to the explanatory power of predicting enrollment in four year institutions for African Americans and Hispanics. Perna also suggests that social and cultural capital should be studied to understand the impact on educational expectations for underserved students.

This study addresses some of the variables associated with social and cultural capital but does not extensively study all of them. Perna notes these variables act as a system of influence as opposed to independently, and the influence is developed through a series of relationships over time. These results may serve as indicators to help policy makers intervene in an effort to increase enrollments in higher education for underserved minority students. Results show that academic dual credit participants have significantly higher mean values for variables (parents’ education and expectations, GPA, household income, extracurricular activities) that are
responsible for influencing college aspirations compared to CTE dual credit participants and non-participants. Understanding how early intervention programs might address some of the social and cultural capital factors that Perna found (parents’ involvement in school, teacher and counselor involvement, help with admission process from personnel at school) influential. Perna’s study focused on the decision to enroll in a four-year university and addressing support structures for underserved students entering a community college would be as important.

Students in CTE programs have been studied to assess the short-term and long-term educational benefits of participation (Karp et al., 2007; Laird, Chen, & Levesque, 2006; Lekes et al., 2007; Rojewski, 1997). The emphasis of the Carl D. Perkins legislation on incorporating dual credit into their programs of study has added to the overall growth experienced in dual credit offerings and has opened the door for more students to experience and benefit from dual credit. These CTE programs also intend to provide the opportunity for students to easily transition from high school to postsecondary education. The path to postsecondary education is important and needs to be examined in order for students to transition easily to college. The most recent changes to the Carl D. Perkins Act (2006) include the development of programs of study that (a) integrate and support academic curriculum along with CTE curriculum and (b) include opportunities for students to participate in dual credit. Based on the results of this study, CTE dual credit may increase aspirations during the senior-year and may indicate CTE is having the desired effect of keeping students interested in education. This study provides support for providing both academic dual credit and CTE dual credit with emphasis on providing a comprehensive CTE program with academic curriculum heavily integrated with the CTE.

Based on the results of this study, females and non-white students may benefit the most from participating in CTE dual credit by increasing their aspirations in their senior-year when
controlling all other variables. But, in an effort to avoid undermining the aspirations of students, it is important that schools do not fall into the practice of placing students in tracked curriculum (Renee Smith-Maddox & Wheelock, 1995). Tracked curriculum involves a sorting of students based on past academic performance and presumed educational needs. Students are placed in a sequence of courses to prepare them for the workforce or for higher education. What is important to consider is the opportunity to reduce the gap between student aspirations and school expectations in an effort for students’ to realize their ambitions (Renee Smith-Maddox & Wheelock, 1995).

At the ninth grade level, students who have college aspirations are more likely to actualize their plans and those students who are undecided about post-high school have the greatest variation in actualized plans (Hossler et al., 1999). Hossler et al. found those students who indicated they were not going to college had the highest dropout rate compared to those students who had decided to attend college or were undecided. The opportunity for changing aspirations can be very critical depending on where the student sees him/herself in identifying postsecondary options. Typically during the senior year, this is considered the search or choice phase of the college decision making process. This research identified that aspirations can change during the senior-year. Since the scope of this research did not identify which phase the students were actually experiencing it is only speculation to confirm these changing were taking place during the search or choice phase of the decision making process. For those students who may not be in the search or choice phase it may indicate instability in aspirations.

Alexander and Cook (1979) suggest educational plans are malleable. They found for most students educational plans are longstanding (prior to the 10th grade) but in two different data sets between 20-24% of students made their decision in the 12th grade. This research did
identify changing aspirations but in responding to the aspirations question, the students were not
given the option to select – undecided. All students were required to make a decision about their
senior aspirations, both initial and final. It appears that most students make a decision at least by
the beginning of their senior year, if not sooner. The fact that aspirations can change during the
senior-year supports Alexander and Cook’s findings that educational plans are malleable. This
research also supports the findings of Mau and Bikos (2000) indicating educational aspirations
can change over time, from 10th grade to 2 years beyond high school. Hossler et al. (1999) note
that 67% of students in the eighth or ninth grade who decide to go to college, go to college
within 1 year of graduation. This leaves time for students who had not decided in eighth or ninth
grade to change their aspirations. This research identified the best opportunity for increasing
aspirations in females and non-white students in the senior year with participation in CTE dual
credit.

**Recommendations**

The results of this study support recommendations for future research and for practice.
Recommendations for future research address some of the shortcomings of this research project.
Recommendations for practice consider opportunities for high school students and the
availability of various high school dual credit offerings.

**Recommendations for future research.** This research looked at changing aspirations
during the students’ senior year while controlling for initial senior-year aspirations and
participation in dual credit their junior-year in high school. Specifically, the following
recommendations are made:
1. Attrition became a concern when nearly 20% of the high school senior class did not continue (i.e., early graduation, transfer, drop outs) to the end of the senior academic school year. With 69 students graduating early, 17 students dropping out, and 14 students choosing other options or moving out of district, the timing of data collection becomes critical. Sixty-nine percent of the students who did not continue in school graduated early and it would be interesting to see the long-term outcomes of those students. It would also be interesting to understand why the students left early if they had the opportunity to earn college credit in high school at no expense. There has been a considerable amount of research done on high school drop outs (Plank, 2001; Plank, DeLuca, & Estacion, 2005) but are there any drawbacks to leaving high school early, why are students leaving high school early, and what recommendations can be made about the K-12 educational system?

2. Since results showed that females and non-white students would benefit more than males and white students by participating in CTE dual credit it becomes important to understand why females do not participate in dual credit rather than participate in CTE dual credit. Further research, perhaps qualitative research might reveal the decisions surrounding females and their lack of participation in CTE dual credit. White students participated significantly more in academic dual credit compared to CTE dual credit and non-white students did not participate over participation in academic dual credit. Since results showed that non-white students would benefit by participating in academic dual credit compared to non-participation it becomes important to understand why non-white students did not participate in dual credit rather than participate in academic dual credit.

3. Using common questions from previous ELS 2002 (National Center for Education Statistics, 2002b) national studies, a new method for identifying household income was developed by the researcher. Questions pertaining to father’s and mother’s occupation and job tasks along with employment status (full-time or part-time) were used to identify state regional annual median salaries by occupation from the Bureau of Labor Statistics (Central Midwest Department of Employment Security, 2010). In some instances father’s and mother’s education level were used to differentiate specific occupations for each individual. This method used information that was provided by the student. In some instances it is necessary to obtain financial data from someone other than the best source. Most students know the title of their parents’ job or can give a brief description, or identify tasks. Students generally know if their parents’ work full-time or part-time. Further research on the reliability and validity of the methodology is necessary.

4. The importance of studying student aspirations is demonstrated in studies that show a positive relationship between educational aspirations and the eventual enrollment in a postsecondary institution (Sewell et al., 1970; K. Wilson & Portes, 1975). But aspirations are not demonstrated behavior and it is known nationally that only 61.6% of high school graduates go to college directly from high school (National Center for Higher Education Management Systems, 2006). The state statistics for which this research was conducted had a college attendance rate directly out of high school equal to 60.7% (National Center for Higher Education Management Systems, 2006). Further research to demonstrate the relationship between participation in dual credit and college attendance along with
qualitative studies may identify barriers to why students’ college aspirations do not result in college attendance.

**Recommendations for practice.** This study has implications for practice that impact both the high school and the college. Dual credit programs can be bridges for students not already planning on college or can be considered as a head start strategy for those already committed to postsecondary education. It is important to use these programs to facilitate the transition from high school to college. As suggested by Venezia et al. (2003), the continued development of credit-based transition programs may improve inter-institutional linkages by bringing continuity and transition to a disjointed P-16 (pre-school to baccalaureate) system. Specifically, the following recommendations can be made to high schools/colleges:

1. An important consideration for high schools is the opportunity for both academic dual credit and CTE dual credit. Some academic dual credit courses (i.e., courses in science, technology, engineering, math) and a number of CTE courses are considered non-traditional programs for females. Non-traditional programs/occupations are defined for each gender. Non-traditional programs/occupations for females are defined by less than 25% of the positions filled by females. Non-traditional programs/occupations for males are defined by greater than 75% of the positions filled by females (National Alliance for Partnerships in Equity, 2007). Traditional science, technology, engineering, and math (STEM) curricula are considered non-traditional for females and unless efforts to encourage females to participate are continued the disciplines will continue to be predominantly male occupied. The importance of offering a variety of non-traditional opportunities (both academic and CTE) for both males and females should be considered.

2. High schools and colleges should offer information sessions for parents and students to fully explain the options available to students. Parents and students need to understand the benefits and potential consequences of participating in dual credit. Many times information is not shared in a manner that reaches all the stakeholders involved. Considering 30% of the sample did not participate in dual credit lack of information may have been the reason. Those parents who have not had a college experience may not know how to navigate the higher education system. Venezia et al. (2003) note the importance of college knowledge and the successful transition from high school to college. Students and parents need to understand the benefits of postsecondary education for all types of students, transfer or career.
3. Early testing of high school students to provide an indication of where students stand with meeting college testing requirement so that they can schedule appropriate course work to prepare for college level work during their junior and senior years. Minimum placement testing scores were a requirement for both academic and CTE dual credit. Students need to understand their abilities and readiness for college level work.

4. Ensure high school students have access to college resources (transcript information, library resources, and other student support services). High school students were not always aware of how many dual credit hours they had earned and maybe did not even perceive themselves as college students. Students need to experience the college environment even though many courses are offered at the high school. The experience is just as important as the course work. As Perna (2000a) noted, high school support systems (school personnel, teachers, counselors) along with parental involvement provide the social and cultural capital necessary to make students, especially underserved minority students, successful.
References


Appendix A

Dual Credit Course Details

Dual Credit Courses listed in High School Description Guide:

Academic Dual Credit as identified by Midwest Area Community College Board (assigned 1.1 PCS code)

College credit hours are presented in parenthesis next to high school course name. Courses are identified as being open to juniors and/or seniors.

<table>
<thead>
<tr>
<th>Course</th>
<th>Junior Year</th>
<th>Senior Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biology 2 H (4)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Anat &amp; Phys H (4)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Field Ecology (3)</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Chemistry 2 H (4)</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>German 4A H (4)</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>German 4B H (4)</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Spanish 4A H (4)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Spanish 4B H (4)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>CP Eng 4 H (3)</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>CP Eng 4 Lit H (3)</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Journalism 1 M (3)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Journalism 2 H M (3)</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Public Speaking (3)</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>U.S. History A H (3)</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>U.S. History B H (3)</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Internat’l Politics H (3)</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Calculus 1 (4)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Calculus 2 (4)</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL ACAD HRS 63 hrs 31 63
CTE Dual Credit as identified by the State Community College Board (assigned 1.2 PCS code)
College credit hours are presented in parenthesis next to high school course name. Courses are identified as being open to juniors and/or seniors.

<table>
<thead>
<tr>
<th>Course</th>
<th>Junior Year</th>
<th>Senior Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ad Web Pg Design (3)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Computer Concepts (3)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Internet Literacy (2)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Keyboarding (1)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Multi Media (1)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Voc Comp Net 1 (7)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Voc Comp Net 2 (7)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Office Procedures (10)</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Office Occ Co-op (12)</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Architec Tech (3)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>CAD Tech (3)</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Voc Machining 1 (3)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Voc Machining 2 (6)</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Voc Welding 1 (2)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Voc Welding 2 (3)</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Child Care 1 (3)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Child Care 2 (3)</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>JILG 1 (3)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>JILG 2 (3)</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Basic Nursing Ass’t (6)</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

TOTAL CTE HRS 84 hrs 44 84
### Appendix B

**Variables, Survey Questions, and Sources**

<table>
<thead>
<tr>
<th>Survey Questionnaire 1</th>
<th>Question</th>
<th>Source/Adapted from</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Survey Questionnaire 2</th>
<th>Question</th>
<th>Source</th>
</tr>
</thead>
</table>
the beginning of ninth grade until now.

Appendix C

Parental/Guardian Refusal Letter

September 2009

Dear Parent/Guardian of Student Participant:

My name is Wendy Howerter and I am currently a doctoral student in the College of Education at the University of Illinois Urbana-Champaign. I am conducting research on the relationship between participation in credit-based transition programs (dual credit and Tech Prep) and educational aspirations. My advisor, Debra D. Bragg, Ph.D. and my dissertation committee have approved this study. The Institutional Research Board of the University of Illinois has reviewed and approved all survey tools. I have also received permission from xxxxx, Principal of XXX High School.

Your student is being invited to participate in a research study. We do not anticipate any risk greater than minimal risk. The purpose of this study is to assess the participation of high school seniors in various academic and non-academic activities. Data will be obtained through several short surveys over the next year, high school ACT scores, and college transcripts, if applicable. The data will be held in confidence to the extent permitted by law. The results of this study may be used for a dissertation, an educational report, journal article and presentation. Pseudonyms or codes will be substituted for the names of students and the school. This helps protect confidentiality.

Three surveys will be administered as part of this research project. A survey will be administered at the beginning of this academic year, at the end of the spring semester, and a follow-up survey next fall. Your student’s participation is voluntary. For those students participating in the data collection process through completion, they will have their name included in a drawing for a $50 gift certificate after participating in the first survey, a $100 gift certificate after participating in the second survey, and a $250 gift certificate after participating in the third survey. You and your student may refuse to participate or withdraw from this study at any time without being subject to any penalty or losing any benefits to which you are otherwise entitled.

By completing this form you are withdrawing consent for your student to participate in this study. All your questions can be addressed through email (email address provided at bottom of letter). All future questions will be handled in a similar manner.

If you understand the above information and wish to withdraw consent to allow your student to participate in this study, please sign your name and today’s date and return to your students’ high school principal, XXX before September 20th.

I DO NOT WANT MY STUDENT TO PARTICIPATE IN THIS RESEARCH STUDY.

____________________________________  ________________
Printed Name of Student     Date Signed

___________________________________  ________________
Parent/Legal Guardian Signature    Date Signed

If you have any questions about your rights as a research participant please contact the Office of School University Research Relations (OSURR) at 217-333-3023 or ber@illinois.edu
Appendix D

Student Information Letter

University of Illinois Urbana-Champaign
College of Education

September 2009

Dear High School Senior:

My name is Wendy Howarter and I am currently a doctoral student in the College of Education at the University of Illinois Urbana-Champaign. I am conducting research on the relationship between participation in credit-based transition programs (dual credit and Tech Prep) and educational aspirations. My advisor, Debra D. Bragg, Ph.D., and my dissertation committee have approved this study. The Institutional Research Board of the University of Illinois has reviewed and approved all survey tools. I have also received permission from XXX, Principal of XXX High School.

You are being invited to participate in a research study. The purpose of this study is to assess the participation of high school seniors in various academic and non-academic activities. Data will be obtained through several short surveys over the next year, high school transcripts, ACT scores, and college transcripts, if applicable. The data will be held in confidence to the extent permitted by law. Should the data be published, your identity will not be disclosed.

Three surveys will be administered as part of this research project. A survey will be administered at the beginning of this academic year, near the end of the spring semester, and a follow-up survey next fall. Your participation is voluntary. For students participating in the data collection process through completion, they will have their name included in a drawing for a $250 gift certificate. All students participating in the September survey will have their name included in a drawing for a $50 gift and students participating in the May 2010 survey will have their name included in a drawing for a $100 gift certificate. You may refuse to participate or withdraw from this study at any time without being subject to any penalty or losing any benefits to which you are otherwise entitled.

Your parent/guardian will be receiving a form to sign if they do not want you to participate in this study. All your questions can be addressed through email (email address provided at bottom of letter). All future questions will be handled in a similar manner. All students will be required to sign several documents of consent. These include consent to participate and consents for release of high school and college transcripts.

I will be coming to the high school in late September and in May 2010 to administer the surveys and collect the appropriate consents. If you have any questions pertaining to this research study you can contact me through email at howarter@illinois.edu. Thank you for considering being a part of this research project.

Sincerely,

Wendy L. Howarter
Researcher and Graduate Student

If you have any questions about your rights as a research participant please contact the Office of School University Research Relations (OSURR) at 217-333-3023 or ber@illinois.edu

The Impact of Credit-Based Transition Programs on Changing Educational Aspirations of High School Seniors

Wendy Howarter – howarter@illinois.edu
Appendix E

Parent Informational Newsletter
Doctoral Research Project at XXX High School

My name is Wendy Howarter and I am currently a doctoral student in the College of Education at the University of Illinois Urbana-Champaign. I am conducting research on the relationship between participation in credit-based transition programs (dual credit and Tech Prep) and educational aspirations. My advisor, Debra D. Bragg, Ph.D., and my dissertation committee have approved this study. The Institutional Research Board of the University of Illinois has reviewed and approved all survey tools. I have also received permission from xxxxxxx, Principal of XXX High School.

Your student is being invited to participate in a research study. We do not anticipate any risk greater than minimal risk. The purpose of this study is to assess the participation of high school seniors in various academic and non-academic activities. Data will be obtained through several short surveys over the next year, high school ACT scores, and college transcripts, if applicable. The data will be held in confidence to the extent permitted by law. The results of this study may be used for a dissertation, an educational report, journal article and presentation. Pseudonyms or codes will be substituted for the names of students and the school. This helps protect confidentiality.

Participation of Senior Students

Your student’s participation is voluntary. You and your student may refuse to participate or withdraw from this study at any time without being subject to any penalty or losing any benefits to which you are otherwise entitled.

If you have any questions about this project or you would like to withdraw your student from this research project, you can contact Wendy Howarter at howarter@illinois.edu

Special points of interest:

- Senior students will be completing the first survey the last week in September, 2009. Student participants will have their name entered into a drawing for a $50 gift certificate.
- Senior students will be completing the second survey in May 2010. Student participants will have their name entered into a drawing for a $100 gift certificate.
- A third survey will be administered through email in September 2010.
- Those students completing all portions of the research project will be entered into a drawing for a $250 Best Buy Gift Certificate—Drawing to be held October 1, 2010.

Contact Information: Wendy Howarter howarter@illinois.edu
SURVEY QUESTIONNAIRE
FIRST SURVEY

Please take your time in filling out the survey. Your responses will be held confidential.

REMINDER:

All participants should have completed the Student Consent to Participate.

I. DEMOGRAPHIC INFORMATION

1. Gender (please check one):  ____Male  ____Female

2. Birthdate:  (_____/_____/_____)  
   Month  Day  Year

3. Ethnicity (please check one):
   _____ American Indian or Alaskan Native
   _____ Asian or Pacific Islander
   _____ Black or African American
   _____ Hispanic or Latino
   _____ Multi-racial/multi-ethnic
   _____ White, non-Hispanic
   Other, _____________________
   ____ Do not wish to respond

II. FAMILY INFLUENCES


   4.A. Highest level of education reached by father/male guardian:  (please check one)
   _____ Did not finish High School
   _____ Graduated from High School or GED Program
   _____ Graduated from high school and attended a two-year school (such as a vocational or technical school, a junior college, or a community college), but did not complete a degree
Graduated from a two-year school (such as a vocational or technical school, junior college, or a community college)

Graduated from high school and went to college, but did not complete a four-year degree

Graduated from four-year college

Completed Master’s Degree or equivalent

Completed Ph.D., M.D. or other advanced degree

Do not Know

Does not apply

4.B. Highest level of education reached by mother/female guardian: (please check one)

Did not finish High School

Graduated from High School or GED Program

Graduated from high school and attended a two-year school (such as a vocational or technical school, a junior college, or a community college), but did not complete a degree

Graduated from a two-year school (such as a vocational or technical school, junior college, or a community college)

Graduated from high school and went to college, but did not complete a four-year degree

Graduated from four-year college

Completed Master’s Degree or equivalent

Completed Ph.D., M.D. or other advanced degree

Do not Know

Does not apply

5. Please describe the present or most recent job of your father or male guardian. (If you have both a father and a male guardian answer for the one whom you are currently living)

5.A. Father’s/male guardian’s current employment: (please check one)

unemployed

employed less than 20 hrs per week (total)

employed 20 or more hrs per week (total)

retired

disabled

does not apply

5.B.1 What kind of work does your father/male guardian normally do? That is, what is the job called? (If he is unemployed, retired, or disabled, answer for his most recent job. If he works more than one job, answer for the job you consider to be his major activity.)

OCCUPATION: ____________________________________________________
5.B.2 What does he actually do in that job? That is, what are his main duties?
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

6. Please describe the present or most recent job of your mother or female guardian. (If you have both a mother and a female guardian answer for the one whom you are currently living)

6.A. Mother’s/female guardian’s current employment: (please check one)

____ unemployed
____ employed less than 20 hrs per week (total)
____ employed 20 or more hrs per week (total)
____ retired
____ disabled
____ does not apply

6.B.1 What kind of work does your mother/female guardian normally do? That is, what is the job called? (If she is unemployed, retired, or disabled, answer for her most recent job. If she works more than one job, answer for the job you consider to be her major activity.)

OCCUPATION:_____________________________________________________

6.B.2 What does she actually do in that job? That is, what are her main duties?
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

III. STUDENT ACADEMIC INFORMATION

Student’s Information:

7. How far in school do you think your parents/guardians want you to go? (please respond to questions 7.A and 7.B)

7.A. Father or male guardian wants me to: (please check one)

____ Complete less than high school graduation
____ Graduate from high school or obtain GED
____ Attend vocational, trade, or business school after high school (1-2 years) or attend one or two years of college
____ Receive Associate’s degree (2 years)
____ Receive Bachelor’s degree (4 years)
Obtain a Master’s degree or equivalent
Obtain a Ph.D., M.D., or other advanced degree

7.B. Mother or female guardian wants me to: (please check one)

Complete less than high school graduation
Graduate from high school or obtain GED
Attend vocational, trade, or business school after
high school (1-2 years) or attend one or two years of college
Receive Associate’s degree (2 years)
Receive Bachelor’s degree (4 years)
Obtain a Master’s degree or equivalent
Obtain a Ph.D., M.D., or other advanced degree

8. As things stand now, how far in school do you want to go? (please check one)

Complete less than high school graduation
Graduate from high school or obtain GED
Attend vocational, trade, or business school after
high school (1-2 years) or attend one or two years of college
Receive Associate’s degree (2 years)
Receive Bachelor’s degree (4 years)
Obtain a Master’s degree or equivalent
Obtain a Ph.D., M.D., or other advanced degree

Thank you!

For completing this survey, your name will be entered into a drawing for a $50.00 gift certificate.
Appendix G

Student Consent

September 2009

You are being asked to participate in a research study conducted by Wendy Howerter, under the supervision of her dissertation director, Dr. Debra D. Bragg, from the University of Illinois Urbana-Champaign. The purpose of this study is to determine if educational aspirations change as a result of participating in credit-based transition programs (dual credit or Tech Prep). Participation in this study is not dependent on participation in dual credit or Tech Prep.

In order to participate in this research study, you are being asked to sign this consent form once all your questions have been answered to your satisfaction. This study consists of completing three surveys that will be administered to individual participants in your high school and by email. You will be asked to provide answers to a series of questions related to your educational and personal experiences in high school. You will also be asked to sign a consent to release a copy of your high school ACT scores and college transcripts, if applicable.

The investigator does not perceive more than minimal risks from your involvement in this study.

The data will be held in confidence to the extent permitted by law. The results of this study may be used for a dissertation, a scholarly report, and a journal article and conference presentation. In any publication or public presentation pseudonyms will be substituted for any identifying information.

Your participation is entirely voluntary. You are free to choose not to participate. Should you choose to participate, you can withdraw at any time without consequences of any kind. If you have questions or concerns during the time of your participation in this study, or after its completion or you would like to receive a copy of the final aggregate results of this study, please contact:

Researcher’s Name  Wendy Howerter  Director’s Name  Dr. Debra Bragg
Department  EOL  Department  EOL
UIUC
Email Address  howerter@illinois.edu  Telephone:  217-244-8974
Email Address  dbragg@illinois.edu  Email Address  dbragg@illinois.edu

Questions about Your Rights as a Research Subject
Bureau of Education Research at 217-333-3023 or ber@illinois.edu

Institutional Review Board Office
528 East Green Street, Suite 203, MC-419
University of Illinois Urbana-Champaign
Champaign, IL 61820
(217) 333-2670
irb@uiuc.edu
I have read this consent form and I understand what is being requested of me as a participant in this study. The investigator provided me with a copy of this form, and I freely consent to participate. I have been given satisfactory answers to my questions.

I understand that my name will be entered into a drawing for a $50 Best Buy gift certificate after participating in the first survey and my name will be entered into a drawing for a $100 Best Buy gift certificate after participating in the second survey. I understand that my name will be entered into a drawing for a $250 Best Buy gift certificate at the end of the research project and that possibility of winning is approximately 1:450. Odds are determined by the number of participants completing the entire research project (3 surveys, and high school ACT scores and college transcripts). The drawing will occur on October 1, 2010 and the winner will be notified by email and/or by postal mail. The high school will also be notified in order for anyone to obtain the name of the winner of the drawing.

______________________________________
Name of Participant (Printed)

______________________________________    ______________
Signature of Participant                                           Date
INSTRUCTIONS FOR HIGH SCHOOL TEACHER/VOLUNTEER-SURVEY 1

This document will describe the process for implementing the survey. Instructions printed in **bold** are transcribed instructions to be read to the students. Instructions in *parentheses and italicized* is information for the teacher.

*(This survey is for senior students only. Each student will receive a packet unless the parent requested the student not participate or the parent letter was returned undeliverable. You will be provided with a list of names of students who should not receive a packet.)*

**TEACHER/VOLUNTEER:**

Students, please listen to this information before opening your packets. This research study is being done by Wendy Howarter from the University of Illinois, a doctoral student in the College of Education. This study is focusing on the college decision making process of high school seniors. Decision making includes the decision to go to college and the decision not to go to college. Participation in this study is voluntary and you may choose to discontinue participation at any time. Your information will be held in strictest confidence. No identifiable information will be published or shared with others.

Participation in this study will involve completing 3 surveys. One today, one in May 2010, and a follow up survey next fall after you have graduated from high school. You will also be asked to provide consent for your high school transcript, ACT score, and college transcripts, if applicable in the spring. All students participating in the September survey will have their name included in a drawing for a $50 gift and students participating in the May 2010 survey will have their name included in a drawing for a $100 gift certificate. If you choose to participate in all three surveys in this study you will be entered into a drawing for a $250 Best Buy gift certificate next fall. You must participate in all 3 surveys and provide consent to access transcripts to be entered into the drawing for $250.

Now you can open your packets. Please find the document on the top titled “Student Consent to Participate”. All students will need to complete the “Student Consent to Participate”. There are two copies available, one for the researcher and one for the student to keep. This form explains more detail about the research study. Please take time to read the consent form and if you want to participate in this study, please sign and date the consent form. Once you have completed the form, leave the form face up on your desk. I will come around and verify signatures before we move to the next step.

*(Please allow 10 minutes for the students (all students need to complete this) to read and sign and 5 minutes for the teacher/volunteer to go around the room and verify each student has signed the consent form. If a student has decided not to participate in the study please pick up the packet and ask the student to sit quietly as the group continues the survey process.)*

Students, place one copy back into the packet envelope and the other copy is yours.

*(Students are now ready to complete the first survey. This should take approximately 15-20 minutes.)*
Students, please find your survey. Read the survey carefully and answer the questions to the best of your ability. There are a total of 14 individual questions. If you feel you need to write additional information on the survey to clarify your answer, this is acceptable. You may begin the survey.

(Please allow 20 minutes for the students to complete the survey, longer if necessary. Questions are straightforward but if the student has a question you cannot answer, the student can write any additional information on the survey that might clarify their perspective on the question.)

Students, you have now completed all the requirements of the first survey. Please place your completed survey in the envelope, seal your envelope, and return to me. Remember to keep your copy of the “Student Consent to Participate”. For all students who chose to participate in this first survey, you will be asked to participate in the second survey which will take place in May 2010. For all students who chose to participate in this survey your names will be added to a drawing for a $50 Best Buy gift certificate. This drawing will be held tomorrow.

Wendy Howerton would like to thank each of you for considering participating in this study. Your help is greatly appreciated and she will see you again in May 2010.
Appendix I

Revised Student Consent

May 2010

You are being asked to participate in a research study conducted by Wendy Howerter, under the supervision of her dissertation director, Dr. Debra D. Bragg, from the University of Illinois Urbana-Champaign. The purpose of this study is to determine if educational aspirations change as a result of participating in credit-based transition programs (dual credit or Tech Prep). Participation in this study is not dependent on participation in dual credit or Tech Prep.

In order to participate in this research study, you are being asked to sign this consent form once all your questions have been answered to your satisfaction. This study consists of completing three surveys that will be administered to individual participants in your high school and by email. You will be asked to provide answers to a series of questions related to your educational and personal experiences in high school and we will request information from your academic records related to dual credits earned.

The investigator does not perceive more than minimal risks from your involvement in this study.

The data will be held in confidence to the extent permitted by law. The results of this study may be used for a dissertation, a scholarly report, and a journal article and conference presentation. In any publication or public presentation pseudonyms will be substituted for any identifying information.

Your participation is entirely voluntary. You are free to choose not to participate. Should you choose to participate, you can withdraw at any time without consequences of any kind.

If you have questions or concerns during the time of your participation in this study, or after its completion or you would like to receive a copy of the final aggregate results of this study, please contact:

Researcher’s Name    Wendy Howerter  Director’s Name    Dr. Debra Bragg
Department            EOL                               Department    EOL
                      UIUC
Email Address         howerter@uiuc.edu                   Telephone:        217-244-8974
                      Email Address:  dbragg@uiuc.edu

Questions about Your Rights as a Research Subject
Bureau of Education Research at 217-333-3023 or ber@illinois.edu

Institutional Review Board Office
528 East Green Street, Suite 203, MC-419
University of Illinois Urbana-Champaign
Champaign, IL 61820
(217) 333-2670
irb@uiuc.edu
I have read this consent form and I understand what is being requested of me as a participant in this study. The investigator provided me with a copy of this form, and I freely consent to participate. I have been given satisfactory answers to my questions.

I understand that my name will be entered into a drawing for a $50 Best Buy gift certificate after participating in the first survey, a $50 Best Buy gift certificate and a $100 Best Buy gift certificate after participating in the second survey, and a $250 Best Buy gift certificate at the end of the research project. Odds are determined by the number of participants completing the survey each time. Each drawing will occur following the administration of the surveys.

I also understand I am providing consent for the researcher to access specific information related to credits earned for dual credit from XXXX College. The information includes the number of dual credit hours earned in the students’ junior and senior years of high school and the credit hours will be identified as transfer credit or career credit. All information received from XXXX College will be handled in a confidential and secure manner. The information will be used for research purposes only.

Summary of Changes

1. The researcher is no longer requesting ACT scores.
2. Participants will be entered into a drawing for a $50 Best Buy gift certificate after participating in the first survey, a $50 Best Buy gift certificate and a $100 Best Buy gift certificate after participating in the second survey, and a $250 Best Buy gift certificate at the end of the research project.
3. The researcher will be accessing specific information related to credits earned for dual credit from XXXX College. This information includes the number of dual credit hours earned in the students’ junior and senior years of high school and the credit hours will be identified as transfer credit or career credit. All information received from XXXX College will be handled in a confidential and secure manner. The information will be used for research purposes only.

To be considered a continuing participant in this survey research you are required to sign this consent.

____________________________________
Name of Participant (Printed)

____________________________________    ______________
Signature of Participant                                           Date
SURVEY QUESTIONNAIRE
SECOND SURVEY

Please take your time filling out the survey. Your responses will be held confidential.

REMINDER:

All Participants: All students should have signed the revised student consent form. Your information will only be used for educational research.

I. DEMOGRAPHIC INFORMATION

1. Birthdate: (_____/_____/_____)  
   Month Day Year

II. STUDENT INFORMATION

Student’s Information:

2. As things stand now, how far in school do you want to go? (please check one)

   _____ Complete less than high school graduation
   _____ Graduate from high school or obtain GED
   _____ Attend vocational, trade, or business school after high school (1-2 years) or attend one or two years of college
   _____ Receive Associate’s degree (2 years)
   _____ Receive Bachelor’s degree (4 years)
   _____ Obtain a Master’s degree or equivalent
   _____ Obtain a Ph.D., M.D., or other advanced degree
3. Please indicate your level of involvement in the following organizations/activities. Please fill-in the bubble that best describes your highest level of participation for each organization or activity. If you do not participate in that specific organization or activity, mark the “no participation” bubble.

<table>
<thead>
<tr>
<th>Organization/Activity</th>
<th>No Participation</th>
<th>Local</th>
<th>County, Regional, District</th>
<th>State</th>
<th>National</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Athletics (Club or Intramural)…..</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>2. Boy Scouts or Girl Scouts…………………</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>3. Boys or Girls Clubs…………………</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>4. Church Youth Group…………………</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>5. 4-H Club…………………………………</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>6. Junior Livestock Associations…..</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>7. Athletics (School Team)…………………</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>8. Band/Choir…………………………………</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>9. Class Officer……………………………</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>10. Foreign Language Club…………………</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>11. Math/Science Club……………………….</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>12. Military (e.g. Jr. ROTC)………………….</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>13. Drama……………………………………</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>14. DECA……………………………………</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>15. Other (specify):________________________</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

4. Please select all statements that are true for you.

- [ ] I have applied to at least one technical college.
  Please provide college name(s):

- [ ] I have applied to at least one community college.
  Please provide college name(s):

- [ ] I have applied to at least one 4 year college/university.
  Please provide college name(s):

- [ ] I have not applied to any postsecondary institutions.
5. For each of the school subjects listed below, mark an “X” in the statement that best describes your grades from the beginning of ninth grade until now.

(Mark one “X” for each subject below)

<table>
<thead>
<tr>
<th></th>
<th>Math</th>
<th>Science</th>
<th>English</th>
<th>History/ Soc Science</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Mostly A’s</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. About half A’s</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>and half B’s</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Mostly B’s</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. About half B’s</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>and half C’s</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Mostly C’s</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. About half C’s</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>and half D’s</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>g. Mostly D’s</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>h. Mostly below D</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Make sure that you have given one answer for each subject above.

6. During your junior year in high school did you successfully complete courses that were awarded dual credit? By successfully complete, we mean complete the course with a passing grade that earns both high school credit and college credit. (Dual credit courses are listed below).

If yes, please check all courses that you successfully completed for dual credit during your junior year.

Dual Credit Courses listed in High School Description Guide:

- ____Biology 2 H (4)
- ____Anat & Phys H (4)
- ____Field Ecology (3)
- ____Chemistry 2 H (4)
- ____German 4A H (4)
- ____German 4B H (4)
- ____Spanish 4A H (4)
- ____Spanish 4B H (4)
- ____CP Eng 4 H (3)
- ____CP Eng 4 Lit H (3)
- ____Journalism 1 M (3)
- ____Journalism 2 H M (3)
- ____Public Speaking (3)
- ____U.S. History A H (3)
- ____U.S. History B H (3)
- ____Intern’l Politics H (3)
- ____Calculus 1 (4)
- ____Calculus 2 (4)
- ____Computer Concepts (3)
- ____Ad Web Pg Design (3)
- ____Keyboarding (1)
- ____Multi Media (1)
- ____Voc Comp Net 1 (7)
- ____Voc Comp Net 2 (7)
- ____Office Procedures (10)
- ____Office Occ Co-op (12)
- ____Architec Tech (3)
- ____CAD Tech (3)
- ____Voc Machining 2 (6)
- ____Voc Welding 1 (2)
- ____Voc Welding 2 (3)
- ____Child Care 1 (3)
- ____Child Care 2 (3)
- ____JILG 1 (3)
- ____JILG 2 (3)
- ____Basic Nursing Ass’t (6)
- ____Other class(es) not listed above (please identify number of courses completed)

If no, please check below.

____ I did not complete any courses for dual credit during my junior year.
7. During your **senior year** in high school are you on track to successfully complete courses that award dual credit? By successfully complete, we mean complete the course with a passing grade that earns both high school credit and college credit. (Dual credit courses are listed below).

If yes, please check all courses you expect to successfully complete for dual credit during your **senior year**.

Dual Credit Courses listed in High School Description Guide:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biology 2 H (4)</td>
<td></td>
</tr>
<tr>
<td>Anat &amp; Phys H (4)</td>
<td></td>
</tr>
<tr>
<td>Field Ecology (3)</td>
<td></td>
</tr>
<tr>
<td>Chemistry 2 H (4)</td>
<td></td>
</tr>
<tr>
<td>German 4A H (4)</td>
<td></td>
</tr>
<tr>
<td>German 4B H (4)</td>
<td></td>
</tr>
<tr>
<td>Spanish 4A H (4)</td>
<td></td>
</tr>
<tr>
<td>Spanish 4B H (4)</td>
<td></td>
</tr>
<tr>
<td>CP Eng 4 H (3)</td>
<td></td>
</tr>
<tr>
<td>CP Eng 4 Lit H (3)</td>
<td></td>
</tr>
<tr>
<td>Journalism 1 M (3)</td>
<td></td>
</tr>
<tr>
<td>Journalism 2 H M (3)</td>
<td></td>
</tr>
<tr>
<td>Public Speaking (3)</td>
<td></td>
</tr>
<tr>
<td>U.S. History A H (3)</td>
<td></td>
</tr>
<tr>
<td>U.S. History B H (3)</td>
<td></td>
</tr>
<tr>
<td>Intern’l Politics H (3)</td>
<td></td>
</tr>
<tr>
<td>Calculus 1 (4)</td>
<td></td>
</tr>
<tr>
<td>Calculus 2 (4)</td>
<td></td>
</tr>
<tr>
<td>Ad Web Pg Design (3)</td>
<td></td>
</tr>
<tr>
<td>Computer Concepts (3)</td>
<td></td>
</tr>
<tr>
<td>Internet Literacy (2)</td>
<td></td>
</tr>
<tr>
<td>Keyboarding (1)</td>
<td></td>
</tr>
<tr>
<td>Multi Media (1)</td>
<td></td>
</tr>
<tr>
<td>Voc Comp Net 1 (7)</td>
<td></td>
</tr>
<tr>
<td>Voc Comp Net 2 (7)</td>
<td></td>
</tr>
<tr>
<td>Office Procedures (10)</td>
<td></td>
</tr>
<tr>
<td>Architec Tech (3)</td>
<td></td>
</tr>
<tr>
<td>CAD Tech (3)</td>
<td></td>
</tr>
<tr>
<td>Voc Machining 1 (3)</td>
<td></td>
</tr>
<tr>
<td>Voc Machining 2 (6)</td>
<td></td>
</tr>
<tr>
<td>Voc Welding 1 (2)</td>
<td></td>
</tr>
<tr>
<td>Voc Welding 2 (3)</td>
<td></td>
</tr>
<tr>
<td>Child Care 1 (3)</td>
<td></td>
</tr>
<tr>
<td>Child Care 2 (3)</td>
<td></td>
</tr>
<tr>
<td>JILG 1 (3)</td>
<td></td>
</tr>
<tr>
<td>JILG 2 (3)</td>
<td></td>
</tr>
<tr>
<td>Basic Nursing Ass’t (6)</td>
<td></td>
</tr>
<tr>
<td>Internat’l Politics H (3)</td>
<td></td>
</tr>
<tr>
<td>Calculus 1 (4)</td>
<td></td>
</tr>
<tr>
<td>Calculus 2 (4)</td>
<td></td>
</tr>
<tr>
<td>Ad Web Pg Design (3)</td>
<td></td>
</tr>
<tr>
<td>Computer Concepts (3)</td>
<td></td>
</tr>
<tr>
<td>Internet Literacy (2)</td>
<td></td>
</tr>
<tr>
<td>Keyboarding (1)</td>
<td></td>
</tr>
<tr>
<td>Multi Media (1)</td>
<td></td>
</tr>
<tr>
<td>Voc Comp Net 1 (7)</td>
<td></td>
</tr>
<tr>
<td>Voc Comp Net 2 (7)</td>
<td></td>
</tr>
<tr>
<td>Office Procedures (10)</td>
<td></td>
</tr>
<tr>
<td>Architec Tech (3)</td>
<td></td>
</tr>
<tr>
<td>CAD Tech (3)</td>
<td></td>
</tr>
<tr>
<td>Voc Machining 1 (3)</td>
<td></td>
</tr>
<tr>
<td>Other class(es) not listed above (please identify number of courses completed)</td>
<td></td>
</tr>
<tr>
<td>1 class</td>
<td></td>
</tr>
<tr>
<td>2 classes</td>
<td></td>
</tr>
<tr>
<td>3 or more classes</td>
<td></td>
</tr>
</tbody>
</table>

If no, please check below.

___ I do not expect to successfully complete any courses for dual credit during my senior year.

8. **What are the plans of your friends?** (please check one response for each question)

**How many of your friends …**

<table>
<thead>
<tr>
<th></th>
<th>None</th>
<th>A few</th>
<th>Some</th>
<th>Most</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. dropped/plan to drop out of high school without graduating?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. plan to have a regular full-time job/military after high school?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. plan to attend 2-year community college?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. plan to attend a four-year college or university?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

215
Follow-Up Survey in fall 2010

A final survey will be emailed to you this fall, and for those who do not respond by email, a paper copy will be sent by postal mail. The final survey will be administered in September 2010, with a deadline for submitting the response by September 30, 2010. This information will also be used to contact the winner of the $250 gift card drawing that will take place immediately following the completion of the final survey (October 1, 2010). The winner will be notified by email and/or postal mail. The high school will also be notified so that all participants may inquire about the winner of the drawing.

PLEASE PRINT CLEARLY.

Student Name: ______________________________________________

Student Email: ______________________________________________________
(List multiple emails if applicable)

Student Home Address: ______________________________________________________

City, State and Zip Code: ______________________________________________________

Student Phone: home (______)_________________________

                cell (______)_________________________

Please also provide address information for two (2) other persons who you know knows how to reach you, for example, a parent, grandparent or aunt/uncle who you are not currently living with but who maintains communication with you.

Name __________________________________________ Relationship to you ________________

Street Address ____________________________________________

City, State, Zip________________________________________

Phone number (______)_________________________

Email ____________________________________________

Name __________________________________________ Relationship to you ________________

Street Address ____________________________________________

City, State, Zip________________________________________

Phone number (______)_________________________

Email ____________________________________________

THANK YOU FOR PARTICIPATING IN THIS SURVEY AND PROVIDING VALUABLE INFORMATION TO THE RESEARCHER. YOUR NAME WILL BE ENTERED INTO A DRAWING FOR A $50 AND $100 GIFT CERTIFICATE TO BEST BUY.
Appendix K

Instructions for Instrument #2

INSTRUCTIONS FOR HIGH SCHOOL TEACHER/VOLUNTEER-SURVEY 2

This document will describe the process for implementing the survey. Instructions printed in **bold** are transcripted instructions to be read to the students. Instructions in *parentheses and italicized* is information for the teacher.

(This survey is for senior students who participated in survey 1. Only participating students will have a packet with their name on it. Please give the student packet to the individual listed on the envelope. If you have a senior student who does not have a packet, they did not participate in Survey 1 or they did not sign the consent form.)

TEACHER/VOLUNTEER:

Students, please listen to this information before opening your packets. It is time to complete Survey 2 of the research study. Again, it is important to note participation in this study is voluntary and you may choose to discontinue participation at any time. Your information will be held in strictest confidence. No identifiable information will be published or shared with others. Continued participation in this study will involve completing today’s survey, signing a revised consent form, and a follow up survey next fall after you have graduated from high school. If you choose to participate in the survey today and sign your revised consent form, your name will be entered into a drawing for a $50 and $100 gift certificate. If you choose to continue to participate in this study through next fall you will be entered into a drawing for a $250 Best Buy gift certificate. You must participate in all 3 surveys and sign consents to be entered into the drawing for $250.

Now you can open your packets. Please locate the revised student consent form. This form is very important. Please read the revised consent form and please sign your name on the back. There are two copies and you may keep a copy for yourself. Changes to the form are summarized on the back. All information collected from Lewis and Clark College will only be used for research purposes.

(Please allow 2-3 minutes for the students to read and sign. All students should complete this form even if they know they do not have college courses on record.)

Students, once you have signed this form, please place the form in the envelope.

Students, please find your survey. Read the survey carefully and answer the questions to the best of your ability. There are 8 questions that include a total of about 25 sub questions. Since the third and final survey will be completed after you graduate from high school, you will be asked to provide some additional contact information at the end of this survey so that the researcher can follow-up with you after graduation. A communication email will be distributed the first week of September 2010. You will be asked to confirm your email address. If you provide an email address, the third and final survey will be emailed to you. If you do not respond to the communication via email or you do not provide an email address, a paper copy of the survey will be mailed to the mailing address you provide. There will be a deadline to respond to the final survey. Make sure you complete the final survey so that you will be included in the final drawing
for the $250 Best Buy gift certificate. The drawing will be held on October 1, 2010. The winner will be notified by email and/or postal mail. The high school will also be notified of the winner so that anyone who participated and completed all the requirements in the research study can find out who won the drawing.

You may begin the survey. If you feel you need to write additional information on the survey to clarify your answer, this is acceptable.

(Please allow 20 minutes for the students to complete the survey, longer if necessary. Questions are straight forward but if the student has a question you cannot answer, the student can write any additional information on the survey that might clarify their perspective on the question.)

Students, you have now completed all the requirements of the second survey. Please place your completed survey in the envelope and make sure your signed consent is also in the envelope, seal your envelope, and return to me. For all students who chose to participate in the first and second surveys, you will be asked to participate in a third and final survey which will take place next fall.

For all students who chose to participate in this survey, you will be entered into a drawing for a $50 and a $100 gift certificate. For those completing today’s survey and consent form, you will be contacted to participate in the final survey and drawing for a $250 Best Buy gift certificate. Wendy Howarter would like to thank each of you for participating in this study. Your help is greatly appreciated and she will contact you again next September, 2010.
Appendix L

Crosstabulation of Senior Academic Dual Credit Hours & Senior CTE Dual Credit Hours

<table>
<thead>
<tr>
<th>Senior Academic Dual Credit Hours</th>
<th>0</th>
<th>1-3</th>
<th>4-9</th>
<th>10-14</th>
<th>Total Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>67</td>
<td>20</td>
<td>4</td>
<td>4</td>
<td>95</td>
</tr>
<tr>
<td>1-3</td>
<td>4</td>
<td>5</td>
<td>1</td>
<td>1</td>
<td>11</td>
</tr>
<tr>
<td>4-9</td>
<td>16</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>20</td>
</tr>
<tr>
<td>10-14</td>
<td>15</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>16</td>
</tr>
<tr>
<td>15-21</td>
<td>21</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>21</td>
</tr>
<tr>
<td>Total Participants</td>
<td>123</td>
<td>29</td>
<td>5</td>
<td>6</td>
<td>163</td>
</tr>
</tbody>
</table>
Author’s Biography

Wendy L. Howarter was born in Quincy, Illinois in 1957. She graduated from Southern Illinois University at Carbondale in 1979 with a Bachelor of Arts in Physiology. She also graduated from St. Mary Hospital School of Medical Technology in 1979 and worked at St. John’s Hospital laboratory for 9 years. During that time she was certified by the American Society of Clinical Pathologists as a Medical Technologist (current terminology is clinical laboratory scientist) and a Specialist in Hematology. Howarter continued her education in Springfield, Illinois and graduated with a Master of Arts in Health Services Administration in 1990 and a Master of Arts in Management Information Systems in 1995 from the University of Illinois Springfield. She worked at Memorial Health System for 6 years in information technology as a project manager and for 4 years as the director of Health Information Management before becoming the Chair of Computer and Office Information Systems at Lincoln Land Community College (LLCC). Currently, Howarter is Dean of District Learning Resources at LLCC.