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Concurrent and Dual Credit: The Bridge to Postsecondary Education for First-Generation College Students

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CONCURRENT AND DUAL CREDIT: THE BRIDGE TO POSTSECONDARY EDUCATION
FOR FIRST-GENERATION COLLEGE STUDENTS

CONCURRENT AND DUAL CREDIT: THE BRIDGE TO POSTSECONDARY EDUCATION
FOR FIRST-GENERATION COLLEGE STUDENTS

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Education in Educational Leadership

By

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ABSTRACT

One of the most significant social challenges facing the United States is increasing the number of students entering postsecondary education and having them persist to degree completion. To accomplish this undertaking, more first-generation college students must matriculate and find academic success. Considerable research exists concerning the barriers first-generation students must overcome; however, little research exists regarding the benefits of participating in dual and concurrent credit coursework as a way to increase confidence and prepare for the rigors of higher education.

The purpose of this correlational, quantitative, exploratory study was to consider the impact of dual and concurrent credit on the GPA and persistence of full-time, first-generation college students at a land-grant, four-year, research institution. The theoretical framework for the study rested on Tinto's *Theory of Academic and Social Integration* and Astin's *Theory of Involvement*. This research design was selected to focus on the predictive relationship between full-time, first-generation college students who completed dual/concurrent credit classes and those who did not. Three research questions were postulated focusing on demographics and first-to-second year GPA and persistence utilizing institutional data.

The study included full-time, first generation college students at the University of Arkansas enrolled during a fall semester between 2004 and 2008. Variables considered included: gender, ethnicity, age, ACT scores, and prior credit hours earned. Results revealed that students were more likely to be female, Caucasian, age 19 or younger, and scored an average of 28 on their ACT. An ANCOVA and linear regression, using the demographic variables, reported the variability and numeric impact of dual/concurrent participation on a student's GPA. A logistic regression was calculated to determine dual/concurrent credit's effect on first-generation

persistence. A multiple regression found that dual/concurrent credit had a nonsignificant, but positive effect on GPA and a logistic regression found a significant positive effect on retention.

The current study helps fill a gap in the literature by addressing dual/concurrent credit and its impact on first-generation postsecondary students. This research may prove useful to practitioners and policy makers searching for ways to help first-generation students bridge the gap from high school to postsecondary education.

This dissertation is approved for recommendation
to the Graduate Council.

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DISSERTATION DUPLICATION RELEASE

I hereby authorize the University of Arkansas Libraries to duplicate this dissertation when needed for research and/or scholarship.

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Todd Arron Loftin

DEDICATION

I dedicate this work to my Lord and Savior, Jesus Christ, without whom I would have no purpose or calling in life. I dedicate this work to all of my family which provided experiences that have laid the foundation from which my care, concern, and dedication arose; to my mother without whom I would have not persisted and found my purpose in life. You have been my foundation and determination to succeed. Marnie, you have always been there and supported me in all my endeavors and without you I would not be who I am today. I dedicate this work to my wife, with whom I have been able to pursue my dream of “family.” Missy, you are the love of my life. Rylee, Reagan, and Reece, you are each a special gift from God and there is a purpose and plan for your life. You have sacrificed as I completed my work. I love you and am thankful for your love and support. Finally, I dedicate this work, my calling and purpose, to all potential first generation college students. I hope that in some way my work makes your dream of attaining a college degree a reality!

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CHAPTER I

INTRODUCTION

Postsecondary education plays an important part in the success of our country, states, and in the lives of individuals. Unfortunately, many high school graduates fail to grasp the significance that higher education has on their future. Current research has suggested students that participate in dual and concurrent credit courses have better educational persistence, are more likely to graduate, and will complete their degree in a shorter time frame than their counterparts (Harrington, 2005; Karp, Calcagno, Hughes, Jeong, & Bailey, 2007). Of equal importance, according to Hoffman and Robins (2005), is that first-time, first-generation college students (FTFGCS) are twice as likely as those with college-educated parents to leave a four-year college before their second year. Thus, it is important to study the impact that participation in concurrent and dual enrollment has on FTFGCS in successfully persisting in college to graduation.

In 2009, the U.S. Census Bureau reported that 27% of males and 35% of females ages 25 to 34 possessed bachelor degrees. The Census Bureau also reported in 2009 that individuals who obtained advanced degrees earned significantly higher salaries than those who failed to obtain a high school diploma. On average, those with advanced degrees earned \$62,313 in 2009 while those who did not earn a high school diploma earned an average of \$18,432 (US Census Bureau, 2012). An individual's income potential in life may well be determined by earning a degree at an institution of higher education; research has shown that students who graduate from institutions of higher education earn higher incomes, are more likely to be employed, and rely less on public assistance (Institute for Higher Education Policy, 2005; Baum, & Ma, 2007). Engle, Bermeo, and

O'Brien (2006) indicated how important postsecondary opportunities are for students who have not historically attended higher education stating that FTFGCS' access "is critical to the future social and economic well-being" (p. 5). Hoffman and Robins (2005) outlined the importance that a postsecondary degree has for those individuals who must compete in today's global economy. They emphasized that "Educators, politicians, and the general public all concur: to earn a family-supporting wage, young people need a postsecondary credential" (p. 5).

The No Child Left Behind (NCLB) Act has raised standards for all students and is aimed at improving student readiness for postsecondary education. Numerous programs have been developed and funded to provide opportunities for low-income, minority, and other underrepresented students. *Talent Search*, *Upward Bound*, and *Student Support Services* are examples of federally funded programs aimed at "increasing college awareness, preparation and participation among low-income and first-generation students" (Engle et al., 2006, p. 11). *Talent Search* is a program enacted to encourage low-income students to successfully complete high school and enroll in a postsecondary educational institution (United States Department of Education, 2010a). *Upward Bound* has a similar purpose. According to the United States Department of Education (2010c) *Upward Bound* was developed to improve the academic skills of low-income students to increase the likelihood of success in high school and postsecondary school. *Student Support Services* also provides support for low-income students, but differs in that the program offers support to low-income, first-generation, or disabled students. The program's primary purpose is to ensure the persistence and eventual graduation of eligible students. Programs such as these have improved standardized test scores, advance placement enrollment, and college attendance (Learner & Brand, 2006). Accordingly, students' involvement and engagement in college access programs has increased access to postsecondary

options and career opportunities. These programs have also provided students with more academic confidence and success in school, which has the potential to lead to postsecondary degree attainment and improvement in the quality of life for the individual and family (Engle et al., 2006). Programs such as these have successfully provided an avenue for FTFGCS who have struggled to achieve the American dream afforded by a college education.

Statement of the Problem

Educators at all levels have a responsibility to prepare every student for a successful future. Previous research has noted that FTFGCS face many potential barriers in their pursuit of educational success, particularly at the postsecondary level. Engle et al. (2006) found that FTFGCS must contend with the following: “(a) lower levels of academic preparation, (b) lower educational aspirations, (c) less encouragement and support to attend college, particularly from parents, (d) less knowledge about the college application process, (e) fewer resources to pay for college” (pp. 14-15). Providing opportunities for FTFGCS to access concurrent and dual enrollment courses while in high school may help first-generation college students to matriculate to postsecondary education, persist, and earn a college degree.

While numerous studies have sought to measure the impact of concurrent credit and dual enrollment on college students generally, little if any empirical research exists that focuses on the benefits of concurrent and dual enrollment courses in contributing to the education persistence of FTFGCS in the college setting. Research has shown that first-generation college students are more likely to drop out of college in their first year than during any other year of postsecondary attendance (Pascarella, Pierson, Wolniak, & Terenzini, 2004). The focus of this study was to examine the persistence and success of FTFGCS from their first-to-second year at a public, research university. This present study will help fill the gap in the literature.

Purpose of the Study

The purpose of this study was to determine if the completion of either one or more dual credit or concurrent courses had a significant effect on the persistence of full-time, first-generation, college students at the University of Arkansas from their first-to-second year. More specifically, this study attempted to ascertain if students' completion of a dual enrollment or concurrent credit class (minimum of three college credit hours) significantly affects students' GPA and persistence after one year in college when compared to FTFGCS who had no prior dual enrollment or concurrent class credit. In addition, through the data collected in this study, a demographic profile of FTFGCS for each of the cohorts examined was constructed. This study used institutional data provided by the University of Arkansas, Fayetteville.

Research Questions

To achieve the purposes of this study, the following research questions were posed:

1. What is the demographic profile of FTFGCS at the University of Arkansas based upon the following characteristics: gender, ethnicity, age, average ACT score, and average college hours earned prior to enrollment?
2. Does completion of a dual enrollment or concurrent credit class (minimum of three college credit hours) significantly impact FTFGCS' GPA from their first-to-second year in college when compared to FTFGCS' GPA who had no prior dual enrollment or concurrent credit classes?
3. Does completion of a dual enrollment or concurrent credit class (minimum of three college credit hours) significantly impact FTFGCS' persistence from their first-to-second

year in college when compared to the FTFGCS who had no prior dual enrollment or concurrent credit classes?

Significance of the Study

Meaningful research studies should contribute to our collective understanding of the field in one way or another. An examination of the literature indicates a lack of research that focuses on the impact that dual/concurrent credit classes have on the academic persistence of full-time, first-generation college students. The limited research that is available suggests there may be a relationship between FTFGCS completion of a dual/concurrent credit course and first year college to second year retention rates (Hinojosa & Salinas, 2012; Harrington, 2005). However, more research is needed to better understand how college coursework experience prior to enrollment may help this at-risk population of students to better persist after entering college on a full-time basis. The significance of this study is that it will add to the existing literature and provide useful information to postsecondary institutions serving a population of FTFGCS, high schools, counselors, parents, and students.

The limited research available has suggested that students who complete dual and concurrent credit courses in high school are more likely than their counterparts to persist, graduate, and complete their degree in less time (Harrington, 2005). “Despite the growing popularity of dual enrollment programs, little rigorous research has been conducted on their effectiveness. Most published literature is descriptive or focused on student and parental opinions and attitudes” (U.S. Department of Education, 2000, p. 1). While this study focused on quantitative data from a land grant, public research university, this research will help fill this void while also encouraging further studies that will aid first-generation college students as they prepare for study at the postsecondary level.

The research is also likely to provide useful information to the University of Arkansas and other similar institutions. Colleges and universities are always seeking ways to increase the retention rate and GPA of freshmen students. Data from this study can be useful to institutional officials charged with designing strategies and programs to help first-generation students improve the likelihood of retention, higher GPA, and ultimate persistence to graduation.

First-generation postsecondary students face difficult obstacles in attending college and successfully obtaining a degree. This research may also provide meaningful information to high school principals, district superintendents, counselors, and other school officials. The results may serve as a basis for examining college preparation opportunities for students, particularly FTFGCS, and their access to dual and concurrent enrollment programs during high school. By documenting the impact of dual/concurrent enrollment classes on FTFGCS first year in college, high schools stand to gain valuable information regarding the effectiveness of providing college access to high school students. The results of this study could provide the necessary information that would propel high schools to offer more college-like opportunities to all students, particularly FTFGCS.

High school counselors may be able to use this research as a means to advise FTFGCS and other at-risk students on the importance of dual/concurrent enrollment classes. Informative data coupled with encouragement may guide FTFGCS and their parents to make better decisions on how best to prepare for college.

Research has indicated the need for improved coordination between secondary schools and postsecondary institutions (Andrews, 2004). By documenting the impact of dual and concurrent enrollment on FTFGCS during their first year in college, the results of the study may

foster an opportunity for dialog to improve coordination and communication between secondary and postsecondary institutions. Studies like the present one could potentially provide support for the development of additional dual/concurrent enrollment classes and other pre-college programs that specifically target FTFGCS and other students to gain a better understand of the rigor and demands of the college classroom.

Finally, students and parents stand to benefit from the research. According to Engle et al. (2006) “Students whose parents did not go to college are considerably less likely to be prepared for college than their peers” (p.15). Researchers Hinojosa and Salinas (2012) found that “on average, students with prior college hours are 2.8 times more likely to be retained after the second year than those with no prior college hours” (p. 18). This study hopefully can provide valuable data that can help guide the decisions of FTFGCS and parents as they chart their path toward higher education.

Delimitations of the Study

The following delimitations were accepted for this study:

1. The study only considered University of Arkansas student cohorts enrolled beginning each fall of the following years: 2004-2008.
2. Aside from the concurrent or dual enrollment credits earned during high school, students must have earned no other college credit hours upon entry into the University of Arkansas.
3. Only full-time students who persisted through their initial academic year of college were included in the study.

4. Only students who had completed concurrent and/or dual enrollment classes while in high school and had been awarded three or more college credit hours at the University of Arkansas were included in the study.

Limitations

Due to the difficulty in obtaining institutional data necessary for this study, it was limited to one institution of higher education and examined five cohorts of students, who were first-time, first-generation students, who had completed one or more dual credit or concurrent enrollment class prior to enrollment. The institutional data analyzed in this study contained a limited number of students who had completed dual/concurrent credit classes while in high school for comparison. Because this study focused on only one postsecondary institution and of the small sample of students that met the criteria for inclusion in the study, any generalization to all FTFGCS or other institutional contexts should be made with caution.

Assumptions

The following assumption underlies this study. The institutional data provided by the University of Arkansas concerning FTFGCS was accurate.

Conceptual Framework of the Study

Providing ways for high schools to increase FTFGCS college retention and persistence to graduation has been the focus of several dual/concurrent credit research studies (Pascarella & Terenzini, 2005). The purpose of this study was to determine if dual/concurrent credit leads to increased GPA and persistence of FTFGCS. Harrington (2005) found that completing dual and concurrent credit classes can have a significant impact on a student's success in college. Welsh, Brake, and Choi (2005) concluded that because of increased student participation and success in dual and concurrent credit, colleges and high schools are likely to develop more dual and

concurrent courses. While there are many programs that provide opportunities for students to gain access to college, a bridge is needed for first-generation college students. Dual/concurrent credit classes might provide the bridge that connects the student's ability to succeed with college-level coursework on a college campus (Calcagno, Hughes, Jeong, & Bailey, 2007; Karp et al., 2007). Two research theories served to establish a theoretical framework for this study. Those theories were Tinto's *Theory of Academic and Social Integration* and Astin's *Theory of Involvement*.

The *Theory of Academic and Social Integration* includes three key facets. First Tinto (1997) expressed the significance of peer learning groups. Students reported that groups provided support in making the transition to college and provided meaningful friendships that encouraged integration within the community of learning. Tinto (1997) also expressed the importance of linking learning experiences from class to class. Students reported that linking learning from class to class provided relevance and significance to classes. Finally students were given more input in the learning process. Their input led to student ownership in the construction of learning (Tinto, 1997). Through these experiences students were encouraged to examine their thinking, and engage in learning through discussion with peers and instructors. Students reported empowerment and increased satisfaction from their involvement in the constructs of the learning experiences.

The second theory underlying this present study postulated that student success and persistence is ultimately determined by involvement. Astin (1999) based his conclusions on a longitudinal study, which led to the development of the *Theory of Involvement*. The theory is based on the findings of student involvement in several areas. Astin (1999) reported that students who: lived on campus, were part of the honors program, were more involved in their academic

studies, frequently interacted with faculty and staff, were involved in athletics, and involved in student government, were significantly more likely to persist. The findings supported the belief that increased persistence was significantly linked to student involvement (Astin, 1999).

Tinto (1997) concluded by emphasizing the importance of developing encompassing experiences that link learning, both socially and academically. Astin (1999) surmised that student engagement, academically and socially, leads to increased persistence. Together the *Theory of Academic and Social Integration* and the *Theory of Involvement* form the framework from which to study the impact of dual/concurrent credit on first-generation college students.

Both theories posited the importance of developing and linking academic and social experiences, which connect students with their institution, link learning socially and academically. Academic and social integration and involvement are critical to foster student persistence in college (Astin, 1999; Tinto, 1997). “A substantial body of research indicates that once students start college, a key factor to whether they will survive and thrive in college is the extent to which students take part in educationally effective activities” (Kuh, Kinzie, Buckley, Bridges, & Hayek, 2007). While there are many programs that provide opportunities for students to gain access to college, a bridge is needed for first-generation college students. “More research on how participation in dual enrollment may contribute to students’ smoother secondary-to-postsecondary transitions is certainly needed” (Hughes, 2010, p.13). Hughes (2010) further suggested that dual and concurrent credit classes can facilitate collaboration among higher education and high schools to the benefit of all potential postsecondary students. Thus, by increasing access to dual and concurrent coursework, colleges and universities working in tandem with public K-12 education may provide many at-risk high school students to gain significant academic and social experiences to help make a successful transition to higher

education (Welsh et al., 2005). Dual/concurrent credit classes might provide a bridge that connects the students from their high school to a college campus, (Calcagno et al., 2007; Karp et al., 2007). Because of the importance of college persistence and success, the effect of dual and concurrent credit courses and FTFGCS should be studied. The results of this study hopefully provide educational institutions with research that can be used in better understanding how to guide first-generation college students toward successful matriculation, college persistence, and the attainment of a college degree. Providing first-generation students with prior college academic and social experience through dual and concurrent credit may be an important bridge to postsecondary education.

Definition of Key Terms

The following definitions of key terms used in this study are included to provide clarity and common understanding.

Concurrent credit course: college courses taken by high school students for college and high school credit at the high school, during the regular school day and taught by high school teachers (National Alliance of Concurrent Enrollment Partnerships (NACEP), 2011)

Dual enrollment: College level courses that are taught at the high school or on a college campus; taught by a high school teacher or a college professor; students are given credit at both the high school and collegiate level (Karp et al., 2007; Krueger, 2006).

First-Generation College Student: A student who is the first person in their immediate family to enroll and attend a college or university (Adelman, 2006; Roderick, Nagaoka, Coca, & Moeller, 2009).

First-Time Full-Time Student: A student who has not previously enrolled in classes at a university or college after high school and who enrolled in a minimum of 12 hours per semester at the beginning of a term.

Freshman: A student who is enrolled for the first time in college after graduating from an accredited high school.

Grade Point Average (GPA): The average of all grade points earned divided by all semester hours attempted.

Persistence: The progress a student makes towards completion of their academic program (Adelman, 2006). More specifically, for the purpose of this study persistence was defined as a student who re-enrolls for the following fall semester (third semester at the University of Arkansas) after completing their first year in college.

Retention: A student returned to college for another semester, another year, or subsequent years (Adams, 2011). For the purpose of this study retention was defined as a student who re-enrolls for the following fall semester (third semester at the University of Arkansas) after completing their first year.

Summary

Postsecondary education affects the personal and economic success of individuals, and ultimately the success of the nation. The purpose of this study was to determine if the completion of either one or more dual credit or concurrent courses had a significant effect on full-time, first-generation college students persistence and GPA from their first-to-second year at the University of Arkansas. In addition, a demographic profile of FTFGCS for the cohorts included in the study was developed.

While FTFGCS often have less academic preparation, lower expectations of their future, less family support, limited college planning experience, and more difficulty in financing college, educational leaders must find ways to increase postsecondary attendance and degree attainment (Engle et al., 2006). The U.S. government has made efforts through federally-funded programs such as *Talent Search*, *Upward Bound*, and *Student Support Services* to increase the likelihood that FTFGCS are better prepared and are supported after arrival at college. These programs aim to increase the likelihood of student success and persistence to degree attainment.

This study is significant because it adds to previous literature providing practitioners with a greater understanding of what may facilitate FTFGCS likelihood of retention and persistence to postsecondary graduation. The limited research on the impact of dual/concurrent credit on first-generation college students provides the foundation from which this study was constructed. Thus, more research is necessary to identify the impact of coursework prior to college on students' persistence in postsecondary education, particularly first-generation students. The findings can provide important information to colleges, universities, high schools, parents, and most importantly, first-generation college students. This study will likely add to the existing literature and provide useful information that will impact the decisions of colleges, universities, parents, and FTFGCS as they are planning for success in higher education.

Chapter II

REVIEW OF THE LITERATURE

We live in a world that is rapidly changing, a world where an individual, state, or a nation can be at the pinnacle of success one moment and on a downward spiral the next. Since its beginning, America has achieved unparalleled economic and social success and postsecondary education has played a significant role in these accomplishments. In order for America, with its ever-increasing diverse population, to continue to be a world leader, an educated populace is more important than ever. On February 24, 2009, President Barak Obama announced in his first joint address to Congress that in order for the U.S. to maintain its position in the world and for every citizen to live the American dream, the number of young adults with college degrees needed to grow substantially. The Obama administration set a national goal of having the largest percentage of college graduates of any nation in the world by the year 2025 (Lee, Edwards, Menson, & Rawls, 2011). However, for the U.S. to achieve the goal of having over 50% of its citizens earn a postsecondary degree, more high school graduates than ever will have to enter postsecondary education and persist to graduation.

Student persistent and graduation have become concerns for all postsecondary institutions. The statistics bear out reasons for apprehension. According to the ACT (2010), only 35% of all college students persist to earn a college degree. Compounding the problem is the large percentage of students that leave college during their first year. Approximately one-fourth of all entering students never enroll for their second year of college, in fact, the ACT (2010) reported that the national first-to-second year persistence rate is approximately 74%. This dropout rate is even higher for an important at-risk segment of college attendees, first-time, first-generation college students (Hoffman & Robins, 2005). This study focused on the effect that

dual and concurrent credit classes have on the academic success and persistence of full-time, first-generation college students.

The review of literature is presented in three sections. Section one examines the importance of postsecondary education and focuses on both national and individual implications. The second section looks at first-generation college student demographics and factors affecting college success, persistence, and graduation. The final section reviews literature concerning concurrent and dual credit programs and describes these programs, their effectiveness, and impact on first-generation and other at-risk college students.

The Importance of Postsecondary Education

The opportunity to attend and earn a college degree is of extreme importance. President Barack Obama, in discussing the importance of education stated:

A world-class education is the single most important factor in determining not just whether our kids can compete for the best jobs but whether America can out-compete countries around the world. America's business leaders understand that when it comes to education, we need to up our game. That's why we're working together to put an outstanding education within reach for every child. (The White House Blog, 2011)

National Implications

The importance of education to our nation's future cannot be overstated. In a study funded by College Board that examined the benefits of higher education both nationally and individually, Baum and Ma (2007) reported that "participation in higher education across different segments of U.S. society should be a matter of urgent interest not only to the individuals directly affected, but also to public policymakers at the federal, state, and local levels" (p. 2). Baum, Ma, and Payea (2010) found higher education benefits society economically, socially, and results in more equity within American society. *The Organization for Economic Co-operation and Development (OCED)* "warned that if postsecondary success were

not made a national priority, our nation's economic and social health would continue to weaken” (Lee & Rawls, 2010, p. 4).

Postsecondary education is important nationally in maintaining the society in which we live. Baum et al. (2010) reported that college graduates pay on average 80% more in taxes than high school graduates. Taxes enable social programs to provide services for many individuals and families who otherwise would have important needs left unmet. A logical extension of that concept is that as an individual's education increases, that individual's need for social programs decreases. Baum et al. (2010) reported that individuals with at least a bachelor's degree reduced government spending on social programs in a lifetime by an average of \$21,000 per person when compared to spending on the same individual with some college education. An earlier study developed by *The Institute for Higher Education Policy* (IHEP, 2005) best summarized the impact of education upon governmental costs. It found that in 2003 “overall, more people with a high school diploma reported receiving public assistance in every state than those with a bachelor's degree, and in 28 states no one with a bachelor's degree reported receiving public assistance” (p. 11). The findings indicated that postsecondary education helps everyone, including those who have not attended college. Those with a postsecondary education have a higher living standard, depend less on government assistance, and provide greater monetary help to those in need.

The economic impact on the nation is also an important aspect to consider. An increase in the number of people earning a bachelor's degree will not be enough to solve the problem. A study by the *Georgetown University Center on Education and the Workforce* found that by 2018 the United States will need 4.7 million new workers who hold a postsecondary degree (Carnevale, Smith, & Strohl, 2010, p. 1). This same study reported as of 2008 that 59% of jobs

required some postsecondary experience and that over the next decade the percentage will increase to 63% (p. 1). The increase in jobs requiring a minimum of postsecondary experience rose from 28% in 1973 to 56% in 1992 to 59% in 2007 (Carnevale et al., 2010, p. 2). The report concluded that increasing college graduates is paramount to the nation's economic leadership and failure to substantially increase postsecondary graduates will negatively affect the country's economy (Carnevale et al., 2010). According to the report *Measuring Up: 2008*, the United States lost ground in both college access and graduation. The report stated America was only 15th among 29 countries in college completion. While we were among the leaders in adults age 35 and older who hold a degree, the United States has dropped to 10th in adults ages 25-34 who held an associate degree or higher (Nation Center for Public Policy and Higher Education, 2008, p. 5). Research has indicated that postsecondary education is important to our nation as we strive to maintain leadership in the world.

The literature provided research that identified numerous benefits of postsecondary education. On the domestic front the United States stands to benefit in numerous ways. Postsecondary education positively impacts the nation, not just by increasing tax revenue, reducing the need for food stamps, and free lunch programs, but by benefiting all citizens and ensuring the United States' continued economic success.

Individual Implications

In a speech on August 9, 2010, at the University of Texas, President Obama stated that 80% of the new jobs being created will require specialized training or a degree from an institution of higher education (Shear, 2010). Increased education is not only essential to our country's future but has become a gateway for employment and a higher standard of living.

The individual's chosen career impacts happiness, sense of belonging, financial stability, and overall success. In his article, *Investments*, leadership expert Steve Kaye (2010) wrote that for a career to be fulfilling, it must align with one's purpose in life: "Ideally, your career will never end because it's a source of both financial and emotional fulfillment" (p. 1). Many individual benefits are documented as a result of a college education. *The Investment Payoff: A 50-State Analysis of the Public and Private Benefits of Higher Education* (2005) identified key data from the U.S. Census Bureau which indicated individuals who had a bachelor's degree or higher were less likely to be unemployed and more likely to earn higher wages when compared to their less-educated counterparts (IHEP, 2005). A 2010 report identified the unemployment rate for college graduates in 2008 as 2.6%, increasing to 4.6% in 2009, while unemployment for high school graduates rose from 5.7% in 2008 to 9.7% in 2009 (Baum et al., 2010). The literature also supported the idea that higher wages for college graduates can be expected as well. *Education Pays: 2010* found that "during their working lives, typical college graduates earn about 66% more than typical high school graduates and those with advanced degrees earn two to three times as much as high school graduates" (Baum et al., 2010, p. 10). A 2008 report found comparable wages for bachelor's degree recipients were up to \$55,700, while the same wages for high school graduates rose minimally to \$33,800 (Baum et al., 2010, p. 11). Improved health is another benefit of a college education that research has identified. IHEP (2005) utilized data from the U.S. Census Bureau and found that individuals that held a bachelor's degree reported "excellent, very good, or good" health 93% of the time. This was compared to individuals who held a high school diploma who reported "excellent, very good, or good" health 82% of the time (p. 13).

There are national and individual implications and benefits to attaining a postsecondary education. The societal benefits of increasing postsecondary education as well as the individual

benefits far outweigh the implications of not attaining a postsecondary degree. The importance of postsecondary education continues to increase for the nation and for individuals. Research supports the need for increased educational opportunity and access for all students.

Readiness for Postsecondary Education: A National Agenda

As high school seniors enter college at a higher rate than ever before, the importance of college readiness increases as well. *Measuring Up: 2008* reported that the likelihood of high school freshmen enrolling in college has grown from 39% in 2000 to 42% in 2008 (p. 5). Students are increasingly attending college, but educators must ensure they are prepared to succeed.

Green and Winters (2005) defined college readiness as students who have obtained a “minimum set of skills and credentials required to attend a four-year college” (p. 1). The report *Mind the Gaps* identified successful completion of the ACT and recommended core curriculum including ACT higher levels of math and science courses as critical (ACT, 2010). According to the ACT, the minimum score indicators for the recommended core areas are: English = 18, Mathematics = 22, Reading = 21, and Science = 24. ACT found that students who scored at or above these benchmarks had a 50% chance of making a B or higher and a 75% chance of making a C or higher in the subject area (ACT, 2010, p. 53). Failure to meet a college’s minimum academic entrance requirements results in students being placed in remedial courses. In *The Condition of Education 2004* it was reported that 28% of freshmen in public four-year institutions and 42% at public two-year institutions were enrolled in remedial classes.

Research indicated there are similarities among students who are not college ready. In a study identifying high school graduation rates and college readiness, Greene and Winters (2005) found that by 2002 only 34% of high school seniors graduated with the skills necessary to

succeed in college; only 23% of African Americans, and a mere 20% of Hispanics were deemed college ready. An Illinois study by Presley and Gong reported similar findings. Their study concluded that there were “significant differences with 54% of black students and 49% of Latino students falling into the not/least ready for college category” in contrast to only 22% of Caucasian and 17% of Asian students who were reportedly not prepared for college (Presley & Gong, 2005, p. 14). Similar statistical patterns existed when analyzing racial and ethnic percentages for those taking remedial coursework. Although 28% of all first-time freshmen entering four-year institutions and 42% of first-time freshmen students entering public two-year institutions enrolled in remedial coursework, the percentages of Black students needing remediation was 42%; 41% for Hispanic; and 41% for Native Americans (Strong American Schools, 2008, p. 13). Research indicated that minorities were most likely to be ill prepared for college (Greene & Winters, 2005). Racial and ethnic disparities remain in relation to college graduation rates when considering race and ethnicity. Ryu (2009) reported that as of 2007, 58% of Asians held a bachelor’s degree and 33% of whites held a bachelor’s degree. A large disparity existed when contrasted with other ethnic groups: only 17% of African Americans, 11% of Hispanics, and 9% of Native Americans earned a bachelor’s degree. Of the students who attended college, *Measuring Up: 2008* estimated that 59% of white students graduated with a postsecondary degree within six years, but only 47% of Hispanics, 40% of Blacks , and 39% of Native Americans completed college within the same six years.

Income levels were also predictors of remediation (Strong American Schools, 2008). Presley and Gong (2005) found that 42% of high school students from families in the lower quartile of family income were not ready for college, but students whose families were in the upper quartile of income were 65% “more or most ready” for college (p. 13). The report *Diploma*

to Nowhere indicated individuals from low-income families required remediation 37% of the time, individuals from middle-income families required remediation 35% of the time, and individuals from high-income families required remediation 31% of the time (Strong American Schools, 2008). The report stated that “low-income families were more likely to take remedial courses than students from high-income families” (Strong American Schools, 2008, p. 12). A decrease in remediation was reported as parental education levels increased. Students of parents who held a bachelor’s degree required remediation 29% of the time. Students whose parents had some secondary educational experiences required remediation 36% of the time. Finally, students whose parents’ highest educational attainment was a high school diploma required remediation 39% of the time (Strong American Schools, 2008). Pressley and Gong (2005) found that “black and Latino students were much more likely to be from lower-income families,” and even though family income increased readiness rates for all racial/ethnic groups, “black and Latino students still lagged behind” (p. 16).

First-Generation College Students

The foundation of this study rests on defining who first-generation college students are and understanding their preparedness for postsecondary success. Literature exists that identifies first-generation college student characteristics, as well as efforts to enhance their college success and persistence, all with the focus on increasing first-generation college students’ success.

The Demographics of First-Generation College Students

A FTFGCS is a student who is the first person in their immediate family to enroll and attend a college or university (Adelman, 2006; Roderick, Nagaoka, Coca, & Moeller, 2009). Ishitani (2005) concurred this is the most common definition used in the literature. In a 2005 study Ishitani broadened the definition into two categories: (a) students whose parents either did

not graduate from high school or only hold a high school diploma and (b) students whose parents attended college but did not attain a degree. For the purpose of this study first-generation college students will be defined as the first person in the immediate family to enroll and attend a college or university. Noticeably absent from the literature is the reference to siblings or the extended family members. Of equal importance is identifying demographic characteristics that identify first-generation college students. According to numerous studies, FTFGCS have a cluster of common characteristics. This study will focus on FTFGCS characteristics of gender, ethnicity, age, and ACT scores.

Bridging the Gap, a study by *National Center for Educational Statistics* (NCES), reported on the characteristics of first-generation college students. The report analyzed data collected as part of the *1995–96 Beginning Postsecondary Students Longitudinal Study*. The study included approximately 12,000 first-generation college students from representative sample of 16.7 million undergraduates throughout the United States (Warburton et al., 2001). The analysis compared percentage data on the characteristics of first-generation college students with non-first-generation college students.

Gender

Gender was one of the many demographics reported in the *Bridging the Gap* study. It was found that a higher percentage of first-generation college students were females (58%) when compared to males (44.2%). Conversely, females made up 54.5% and males 45.5% of the non-first-generation college students (Warburton et al., 2001). Additional research supports a higher percentage of first-generation college students being female. Nunez and Cuccaro-Alamin, (1998) reported a greater percentage of female (57%) first-generation college students compared to 51% of females who were not first-generation college students. Another study conducted by NCES

found a higher percentage of first-generation students being female (60.2%) when compared to females (48.5%) who parents had a bachelors degree or higher. In the same report, NCES found that 39.8% of males enrolled in college were first-generation students compared to 51.5% of males whose parents had completed college (Chen, 2005).

Ethnicity

Ethnicity was another demographic characteristic reported. NCES indicated that Hispanic students made up 18.1% of first-generation students while black students accounted for 13.5% of the overall first-generation student population. Comparatively, Hispanics comprised 7.4 % of the non-first-generation college students while blacks comprised 8.2% (Warburton et al., 2001). First-generation white students were 61.3% compared to 76.1% of white students who were not first-generation college students. Asian/Pacific Islander students accounted for 5.5% of the first-generation population and 6.0% of the non-first-generation population. Finally, American Indian/Alaskan natives made up 0.6% of the first-generation college students and 0.7% of the non-first-generation college students.

Age

The NCES study showed that first-generation college students tend to be older than students who are not first-generation college students. Warburton et al. (2001) reported that 71% of first-generation college students were age 18 or less compared to 82.8% of non-first-generation college students. As age increases so does the percentage of first-generation college students compared to non-first-generation students. First-generation students ages 19-24 years old made up 20.2% of the compared to 15.4% non-first-generation college students. Finally, 7% of first-generation college students were age 30 and older compared to less than 1% non-first-generation college students who were 30 and older (Warburton et al., 2001).

SAT or ACT

According to the NCES 49.8% of first-generation college students took the ACT or SAT compared to 60.3% of students whose parents attended some college, and 71% of students who had at least one parent who earned a bachelor's degree (Chen, 2005). The research also categorized students ACT, SAT, and PSAT scores by consolidating scores into a single numeric band for comparison purposes. Student scores were then placed into low level, middle level, and high level. The lowest level was made up of all students in the lowest quarter of all scores. The middle level consisted of the middle two quarters of scores and the high level was made of the highest quartile (Chen, 2005). The report found that 40% of the first-generation students were in the lowest quartile compared to 12% of non-first-generation college students with at least one parent with a bachelor's degree. There was minimal difference in the middle quartiles as 49.4% of first-generation students were found in the middle compared to 49.2% of students who had at least one parent who held a bachelor's degree. There was a distinction between first-generation students in the higher level (10.3%) when compared to students who had at least one parent with a college degree (38.7%) (Chen, 2005).

An analysis of data by Engle and Tinto (2008) provided researchers with a clearer picture of the characteristics of first-generation college students. Their study entitled *Moving Beyond Access* used data sets from NCES. The data sets analyzed were titled: *National Postsecondary Student Aide Study (NPSAS)*, *Beginning Postsecondary Students (BPS)*, and *Baccalaureate and Beyond Study (B&B)*. Engle and Tinto reported 30% of first-generation college students were single parents with dependent children, compared to 4% of non-first-generation students. First-generation students' average age at time of enrollment into college was 23 while students who were not first-generation college students enrolled on average at the age of 20. First-generation

students were also more likely to be female . Engle and Tinto also found that first-generation students were 54% more likely to be a minority compared to 26% of students who were not first-generation. FTFGCS were also found to be more likely a minority from lower-income families and less likely to be academically prepared for postsecondary education. Not surprisingly, FTFGCS are less likely to earn a degree. The researchers noted that after six years only 11% of low-income, first-generation college students attained a bachelor's degree compared to 55% of those who were not classified as low-income, first-generation students. FTFGCS were also more likely to delay enrollment one year or more. In fact 53% of low-income, first-generation students delayed enrollment in four-year institutions compared to only 24% of students who were not first-generation or low-income. Factors such as students' work, financial responsibilities, and family circumstances help explain why first-generation students are less likely to enroll in four-year institutions. When considering persistence after one year Engle and Tinto reported that 26% of first-generation college students did not re-enroll their second year, and after six years 43% of low income first-generation students were not enrolled in college. Conversely 7% of non-low income, non-first-generation students failed to re-enroll and after six years 20% were no longer enrolled.

Pascarella, Pierson, Wolniak, and Terenzini (2004) conducted a study considering the college experiences and outcomes of first-generation college students. The sample included approximately 1,054 students who were participants in the *National Study of Student Learning* (NSSL) “from 18 four-year colleges for a period of three years” (p. 252). The study examined the differences between first-generation college students and other students and sought to consider the effects of parental education. The academic and nonacademic experiences of students were also examined. Results of the study indicated that first-generation college students

complete fewer credit hours (Beta = 0.114, $p < 0.01$) and work more during their college career (Beta = -0.087, $p < 0.05$) than students whose parents had higher levels of education. First-generation college students were also more likely to live off campus compared to non-first-generation college students (Beta = 0.151, $p < 0.01$) and were less involved in the extracurricular college activities (Beta = .107, $p < 0.01$). The study also showed that first-generation students had lower grades in their college coursework (Beta = 0.071, $p < 0.05$) than peers who were not first-generation college students (Pascarella et al., 2004). The results suggested that non-first-generation college students derive more from their extracurricular experiences than do first-generation college students; which in turn has a positive impact on their postsecondary education. The researchers also found that first-generation college students are less likely to attend more prestigious institutions, instead opting for less selective ones. It was concluded that extensive student involvement in volunteer activities, employment, and/or collegiate athletics, can have a negative impact on students, but seems to have an even greater negative impact on first-generation college students.

Defining first-generation student characteristics is important to understanding students who are the first in their family to attend college. Research has found that first-generation college students tend to be female, older, and often minorities. First-generation students are also more likely to score lower on SAT/ACT tests. Finally, they tend to have more financial issues than their counterparts and must therefore work while attending college. In addition, first-generation college students tend to be less prepared academically for the rigor of college. While not all FTFGCS fall into the categories above, these characteristics hold true for the majority of first-generation college students.

Factors Affecting the Academic Success of First-Generation College Students

The literature indicates that FTFGCS face three key barriers in achieving academic success at postsecondary institutions. Lack of support, financial difficulties, and academic preparedness are challenges many first-generation students face in matriculating from high school to postsecondary education and persisting to graduation. All three barriers will be examined in the preceding section.

Research has shown that students who have parents and other family members that attended and graduated from college can provide an important support system. Chen (2005) reported that 26% of first-generation college students enrolled in college earned a bachelor's degree. Research has indicated that students whose parents had not attained a postsecondary degree were less likely to enroll and graduate from college (Engle et al., 2006). *The National Center for Education Statistics* (NCES) reported only 43% of first-generation students who started college graduated with a degree (Chen, 2005). Conversely, Chen (2005) reported that 68% of students whose parents had completed a bachelor's degree graduated from a postsecondary institution within eight years. The family's lack of experience involved in enrolling and persisting at the postsecondary level contributes to the difficulties that FTFGCS face. Without support, the likelihood of a FTFGCS obtaining a postsecondary degree diminishes greatly (Chen, 2005; Stiplin, 1999). Lack of family support discourages first-generation students from attending college, causing them to doubt their academic abilities. Family members who hold a postsecondary degree may help their children prepare, apply, and finance a postsecondary education (Engle et al., 2006). This lack of support makes it difficult for FTFGCS to navigate the myriad of obstacles that most students face when considering and entering college.

Even with the experiential support of parents, finances can become a significant barrier for any student pursuing a college postsecondary degree. The financial impact is even greater on FTFGCS; since first-generation students often come from a lower socio-economic background, the amount of money required to begin, much less to complete, college without family support is a difficult challenge that contributes to the FTFGCS lack of persistence (Warburton et al., 2001). As debt mounts while pursuing a degree, many students see the benefits of getting a job as being more worthwhile than possible benefits they may receive in earning a degree. Ishitani (2003) reported on the negative impact that low-income has on students' persistence. In the study, students whose family income was \$25,000 or less were 49% more likely to leave postsecondary education during their first ($\beta = 0.400$) or second ($\beta = 0.229$) year. Financial issues are a barrier but not an insurmountable one.

Finally, first-generation college students often lack the necessary coursework and rigor to prepare them for postsecondary success (Choy, 2001; Warburton et al., 2001). In the study *Straight from the Source* Engle et al. (2006) sought to determine the impact that pre-college services have on first-generation college students. The study used data obtained from 135 first-generation college students. First-generation college students did report that pre-college programs were helpful in preparing for the rigors of college (Engle et al., 2006). Warburton et al. (2001) found that the academic preparation of students was strongly associated with success in college. The study indicated that students who had not taken a rigorous high school curriculum were less likely to persist. The study concluded that first-generation students who took rigorous coursework were 87% likely to persist to degree compared to 62% of students who did not take rigorous high school coursework (Warburton et al., 2001).

Other Factors

There are many factors that lead to student success in college. First-generation college students are no different, but the reasons for their success may differ from traditional college students. While the premise of this study is based on pre-college preparation that first-generation students are able to experience through dual/concurrent classes, it would be remiss to fail to consider additional non-cognitive factors that might affect first-generation students.

By developing the non-cognitive questionnaire (NCQ) Tracey and Sedlacek (1984) were able to predict success and persistence of college students, particularly students who possess the same demographic characteristics of FGCS. The NCQ utilizes analysis of eight different factors to predict success and persistence. The eight are: (a) positive self-concept or confidence; (b) realistic self-appraisal, (c) understanding of and the ability to deal with racism, particularly important for minorities in predominantly “white” institutions; (d) preference for long-range goals over short term or immediate needs; (e) availability of strong support person; (f) successful leadership experience; (g) demonstrated community service; and (h) knowledge acquired in a field (White & Sedlacek, 1986, p. 21). White and Sedlacek (1986) utilized the NCQ in *Noncognitive Predictors: Grades and Retention of Specially-Admitted Students* to predict the grades and retention of students who might fall into the first-generation college student category. The study focused on 58 freshmen who were specially admitted to the University of Maryland. Each student was given the NCQ prior to enrollment. The students responded to the eight predictors developed by Tracey and Sedlacek. Through a multiple correlations test White and Sedlacek (1986) determined after two semesters that leadership and self-concept were strong predictors of college GPA. The researchers concluded that “After three semesters understanding and dealing with racism and successful leadership were most valid” (White & Sedlacek, 1986, p.

21). By the fourth semester White and Sedlacek found that self-confidence, having a strong support person, and students' ability to deal with racism provided the most accurate prediction of college GPA. In regards to retention, White and Sedlacek (1986) found that "positive self-concept were the best predictors of retention after the second and fourth semesters, while successful leadership and having a strong support person were the best predictors of three semester retention" (p. 21). These factors have been established as effective predictors of student success and persistence and may play a role in the success and persistence of the first-generation college students.

In another study, Siu-Man Ting (1998) utilized the NCQ developed by Tracey and Sedlacek along with the students' ACT score and high school rank to predict the academic performance of first-generation college students. The study included 54 students at a Midwest university. As a part of the study, first-generation students were provided with the NCQ and responses were calculated. Ting found using a step-wise multiple regression analysis that both the non-cognitive and cognitive factors were valid in predicting first-generation student success. "High school rank, successful leadership experience, and demonstrated community service appears to be the strongest indicators" (Ting, 1998, p. 21). Ting's study also reported that the ACT score of first-generation college students was not a strong predictor of students' GPA. Ting went on to posit that "a combination of cognitive and psychosocial variables are found to be effective in predicting the academic success of first-generation and low-income students in a university" (p. 22).

First-generation college students face many challenges in making a successful transition from high school to postsecondary education. They must navigate the barriers of lack of family support, financial hardships, and inadequate academic preparation. However, it is possible that

the development of certain non-cognitive factors will help them make the transition and persist to degree completion.

Persistence and Graduation

Once at a postsecondary institution, FTFGCS face another difficult obstacle: persistence to graduation. This section explores literature that examines potential obstacles that FTFGCS face once they enroll in a college or university.

Research has shown that the chance of students leaving postsecondary education has the greatest likelihood of occurring in their first-year of college (Upton, Gardner, Barefoot, & Associates, 2005). Many factors lead to this phenomenon. According to Folger, Carter, and Chase (2004), FTFGCS who drop out of school often lack any meaningful connection with the university and therefore have limited support, a critical component of persistence. Faculty and staff serve as important connections for all students. Pascarella and Terenzini (1991) found that student and professor interaction is a significant factor in student persistence. According to Reason, Terenzini, and Domingo (2007) faculty and staff interactions with students has been shown to impact persistence rates among first-year students. Positive interactions among students are equally important. Astin (1993) found that “the student’s peer group is the single most potent source of influence on growth and development during the undergraduate years” (p. 398). Early postsecondary academic performance is another critical factor. Once students experience support at the university they are encouraged leading to confidence and a greater desire to persist and succeed.

Support Systems

While many barriers make matriculation, persistence, and graduation from postsecondary education difficult for FTFGCS, programs have been developed to encourage first-generation

students to seek and complete their degree. One of the most important federally-funded initiatives is called *TRIO*, because it includes three components and eight different programs: *Upward Bound, Educational Talent Search, and Student Support Services*. The intent behind the *TRIO* programs is to increase postsecondary enrollment and graduation among economically disadvantaged and first-generation college students. These programs are funded through grants made available to postsecondary institutions, secondary schools, and certain other public and private agencies serving at-risk youth (Humphrey, Carey, & Mansfield, 2002). Funding for these programs was originally authorized by Congress through the *Higher Education Act of 1965 and currently is made available through subsequent reauthorization acts* (Minnesota TRIO, 2010). The *TRIO* programs are administered by the U.S. Department of Education Office of Postsecondary Education. Consequently, programs such as *TRIO* have been the primary source of support for FTFGCS (United States Department of Education, 2010b).

Upward Bound is one *TRIO* program aimed at preparing students for higher education while still in middle school, junior high school, and high school. The program focuses on students who are FTFGCS and who come from low-income families (United States Department of Education, 2010c). The “Higher Education Act” (1965) established the *Upward Bound* program to “generate skills and motivation necessary for success in education beyond high school among young people from low-income backgrounds and inadequate secondary school preparation” (p. 1). Students enter the *Upward Bound* program during their ninth or tenth grade year of high school. During the program students are exposed to different activities and interactions aimed at increasing the likelihood of college attendance, including regular meetings throughout the school year, and a summer program that runs approximately six weeks (United States Department of Education, 2009).

The *Talent Search* program is focused on increasing lower-income FTFGCS' entrance into college. The *Talent Search* programs are implemented by two- or four-year postsecondary institutions, by other public or private agencies, or in partnership. Participants of *Talent Search* begin in the sixth grade and are between the ages of 11 and 27 years old (Engle et al., 2006). *Talent Search* is the largest *TRIO* program, and in 2004 served approximately 382,500 students across the U.S. (Constantine, Seftor, Martin, Silva, & Myers, 2006). According to the University of Arkansas website (2012), the program's purpose is to provide support and motivation to enable students to earn a baccalaureate degree. The United States Department of Education website (2010a) notes that the goal of *Talent Search* is to encourage economically disadvantaged youth and first-generation college students to complete high school and enroll in a postsecondary institution.

While helping first-generation students' access to postsecondary institutions is important, providing support to ensure persistence and graduation once on campus is equally important. *Student Support Services (SSS)* is a *TRIO* program aimed at increasing the persistence and graduation rates of first-generation and low-income students (Muraskin, 1997). Zhang, Chan, Hale, and Kirshstein (2005) stated that to be a part of the program a participant must be either low income, a first-generation college student, or disabled. Further, at least two-thirds of the students must be low-income and disabled or first-generation college students. Not surprisingly, many of the participants tend to have other issues that impact their college success including low GPA, SAT and/or ACT scores, as well as failing grades, or a combination of those factors (Zhang et al., 2005). Zhang and Chan (2007) also indicated that other SSS goals include increasing the transfer rates of program participants from two-year institutions to four-year institutions and fostering the development of support services for SSS participants. The

difference between this program and the others is that this program offers students assistance once enrolled and on a college campus. According to Zhang et al. (2005), students involved in the program receive academic instruction and support, mentoring and counseling programs, and extension and enrichment activities. The *SSS* program also provides participants with assistance in making financial decisions. This assistance takes the form of access to financial aid and other resources that might otherwise be difficult for FTFGCS to obtain. In addition, students have access to career information, which allows for the development of career goals that align with the school's educational offerings. As part of this process, many *SSS* programs offer mentors so students have direct experience with opportunities in various professions (Zhang et al., 2005). Another distinguishing aspect of the *SSS* program is the extra activities provided to enable students to fit in to the educational setting. *SSS* programs offer students opportunities to visit other institutions to which they might aspire. Students are also given opportunities to attend guest lectures, symposiums, and other college-sponsored activities. This helps acquaint students with a deeper experience in their fields of study and increases the probability of persistence and graduation (Zhang et al., 2005). Each component is an integral part of the *SSS* program services.

First-generation college students have reported that because of *TRIO* programs, enrolling in college, staying in college, and persisting to graduation was much easier (Engle et al., 2006). *TRIO* programs have a long history of offering first-generation students encouragement and support, preparing them to enroll and persist in college.

Dual and Concurrent Credit Programs

The literature offers numerous definitions of dual and concurrent credit. *The National Research Center for Career and Technical Education (NRCCTE)* defined dual enrollment as collaborative efforts involving both high schools and colleges that enable high school students to

enroll simultaneously in high school and college classes. Thus, dual credit courses allow high school students the opportunity to earn college credits and credit towards high school graduation at the same time (Karp, Calcagno, Hughes, Jeong, & Bailey, 2007). Dual enrollment courses are taught by specially approved high school teachers or college professors. These courses are offered at local high schools or on college campuses. For the purpose of this study dual enrollment was defined as college level courses taught at the high school or on a college campus, by a high school teacher or college professor; students are given credit at both the high school and collegiate level.

Concurrent credit classes are similar to dual enrollment. Harrington (2005) explained that in concurrent credit classes the instructor is qualified to teach both high school and college courses. The *National Alliance of Concurrent Enrollment Partnerships (NACEP)* (2011) defined concurrent enrollment as a “program that offers college courses to high school students in the high school, during the regular school day, taught by high school teachers” (p. 1). A distinct difference is concurrent credit classes are taught by high school teachers, at the high school, during regular high school hours whereas dual credit classes are often taught by either college professors or high school teachers, at a high school or college campus with no specified times (Karp et al., 2007; NACEP, 2011). One common thread is that both dual and concurrent credit classes award high school and college credit.

Effectiveness of Dual and Current Credit Programs

This section presents a review of the literature regarding dual/concurrent credit participants and the effectiveness of the programs on academic success and persistence. Studies have been conducted to measure and report the effects of dual/concurrent credit. While numerous studies exist that purport to investigate the impact of dual/concurrent credit on student success,

few if any have addressed the focus of this research. Pertinent studies will be presented that relate to the specific impact of dual/concurrent credit on first-generation college students.

Hinojosas and Salinas (2012) conducted a study at the University of Texas-Pan American entitled *A Review of Prior College Hours Earned by Entering Freshmen at UTPA*. The study compared all students at the University of Texas-Pan American with and without prior college credit. There was no distinction made between FTFGCS and non-first-generation college students. The purpose of the study was to determine if college credit prior to college entry had an impact on retention, graduation rates, and the GPA of students. GPA and likelihood of persistence were considered based on students' completion of college credit prior to college entry. Hinojosas and Salinas (2012) used *t* tests and chi-square tests to determine the significance of previous credit on students' success and persistence. Logistic regressions were completed to determine odds ratios. The study did not report *t* scores, *p* scores, or odds ratios for any of the data reported. The report only included percentages and the numerical likelihood of retention or increased GPA. The study revealed that there was a positive impact of previous credit on students' GPA and first-year persistence. In the fall 2008, students with prior college credit had a cumulative GPA of 2.80 compared to a 2.09 cumulative GPA of students with no prior college credit. In 2009, students with prior college credit reported a cumulative GPA of 2.71 compared to a 1.98 cumulative GPA for students with no prior college credit. In 2010, students with prior college credit had a cumulative GPA of 2.74 compared to a cumulative GPA of 1.99 for students with no prior college credit (Hinojosas & Salinas, 2012). Based on their findings, Hinojosas and Salinas (2012) reported that students with prior college credit can expect a higher GPA during their first year in college when compared to students with no prior college experience. Hinojosas and Salinas also reported on student persistence. The study revealed that students with previous

college credit were 2.7% more likely to persist after their first year in college when compared to students without previous college credit (Hinojosas & Salinas, 2012). The significance level of the study was not revealed, but the report did state the findings were significant.

McCormick (2011) conducted a study of 389 Tennessee students who completed dual enrollment courses at Chattanooga State Community College in 2005, and then enrolled in a postsecondary institution. Participants consisted of all students, FTFGCS and non-first-generation college students. There was no differentiation between first-generation college students and non-first-generation college students. The purpose of the study was to determine the effect of dual credit on student persistence. To determine persistence, McCormick considered the relationship between demographic variables and dual credit participation. Comparisons were made by considering correlational coefficients and utilizing a linear regression model. The outputs of persistence were reported in terms of percentages. McCormick noted that 95% of the dual credit participants enrolled in a four-year institution and that “most of the students were on track to persist toward program completion, beginning in both 2 year and 4 year colleges/universities” (McCormick, 2011, p. 84). McCormick reported that of all students who entered two-year colleges (n=51), 96% persisted two terms. Of the students who entered 4 year colleges (n=283), 90% persisted four terms (McCormick, 2011, p. 69).

The effect of dual credit on students' GPA and persistence was examined by Duffy (2009) at the University of Tennessee - Martin. The researcher included participation in Advanced Placement and International Baccalaureate as dual credit. The population of the study included only first-time, full-time freshmen, fall semesters only, beginning in the fall 2000 through the fall 2006 at the University of Tennessee Martin. There was no distinction between FTFGCS and non-FTFGCS. The sample size of students without any type of dual credit prior to

enrollment totaled 300, the sample size of students with advanced placement classes totaled 181, and students with college offered credits prior to freshman enrollment totaled 305 students. Using the ordinary least squares (OLS) model, Duffy considered the impact that dual credit has on GPA. Duffy conducted the tests using the .05 level as the determinant of significance. When controlling for pre-entry factors, Duffy found no significant difference in the GPA of students with prior dual credit when compared to students with previous dual credit. In relation to persistence, Duffy did not find a significant difference in persistence among students who completed different types of pre-college credits.

A study which considered similar components of dual/concurrent credit was conducted by Harrington (2005). The study considered the persistence of dual/concurrent first-time college students at Arizona State University during the fall of 1998. Both first-generation and non-first-generation college students were included in the study. Harrington compared 1,154 students with dual/concurrent credit to 3,845 students without dual/concurrent credit. A logistic regression model was used by Harrington to calculate the impact of dual/concurrent credit coursework on persistence and success. A significance level of $p < .05$ was used. Harrington also completed an Exp (B) Odds Ratio to predict persistence. Harrington reported that dual/concurrent credit did impact persistence. After completing an Exp (B) Odds Ratio, Harrington found that dual/concurrent credit participants were twice as likely to persist when compared to non-dual concurrent credit participants. Eighty-four percent of students with dual/concurrent credit persisted into their second year when compared to a 71.1% rate of persistence for non-dual/concurrent credit participants (Harrington, 2005).

An Analysis of the Effects of High School Student Concurrent Enrollment at Collin County Community College District was a study by Swanson (2003) that considered the impact

of concurrent credit on students at Collin County Community College District (CCCCD) from fall 1995 through spring 2002. The study included both FTFGCS and non-first-generation college students. Swanson examined how participation in concurrent credit classes affected students' persistence and GPA when compared to students who did not complete concurrent credit classes (Swanson, 2003). The population was students who were attending Collin County Community College while they were still in high school between the fall of 1995 and spring of 2002 and totaled 2,317 (Swanson, 2003). An ANOVA was used to compare and a post hoc test was conducted using Tukey a. The level of significance was considered at the $p < .05$ level. In comparing GPA, Swanson found that concurrent students had significantly higher GPAs than students who had not completed concurrent credit classes. When comparing the mean GPA of concurrent students with a matched comparison sample, concurrent students reported a 3.03 compared to non-concurrent credit students at 2.84. Swanson reported the mean difference of 0.191 was significant at the .05 level using a two-tailed t test (Swanson, 2003, p. 91). Swanson determined that students who completed concurrent credit classes prior to enrollment at the community college persisted at a greater rate when compared to non-concurrent credit students. Students who completed concurrent credit coursework persisted at a greater rate each year data were available. When Swanson compared the persistence rate of former concurrent students to a matched comparison group concurrent students persisted 90% of the time compared to 83% of non-concurrent credit participants, "based on a two-tailed t test, the .07 difference between the two means is significant at the $p < .05$ level" (Swanson, 2003, p. 89). Swanson explained that an analysis over the seven year period yielded significantly higher retention rates among students who completed concurrent credit coursework when compared to non-concurrent credit students. When comparing concurrent credit students with non-concurrent students from fall to fall,

Swanson found a significant difference in the persistence. The seven year retention rate for concurrent credit students was 74% compared to 67% for non-concurrent credit students.

Swanson found significance at the .05 level (Swanson, 2003).

The National Center for Career and Technical Education (NRCCTE) conducted a study for the purpose of considering the impact of dual credit on students' GPA and persistence. The population of the study came from dual enrollment programs in Florida and New York. The total population of students from New York totaled 2,303 and the total from Florida totaled 299,685. The data set from *The City University of New York (CUNY)* was obtained from the *Office of Institutional Research* and included all students enrolled between 2001 and 2002, whether FTFGCS or non-first-generation students. The New York sample population included only students who had attended one of 19 vocational schools located in New York City which limited the number of students considered. Florida's dataset came from all students enrolled in Florida public schools beginning in the fall of 2000 and ending in the spring of 2002. All students, FTFGCS, non-first-generation students, dual/concurrent enrollment participants and non-dual/concurrent students were included in the study. The report was broken down into reports from the Florida data set and the New York data set (Karp et al., 2007).

The Florida study found that dual enrollment participants' college GPA was significantly higher than their peers one year after high school graduation. Students who participated in dual enrollment courses earned GPAs that remained statistically higher than that of their peers after two years of college as well as after three years (Karp et al., 2007, p. 33). Dual enrollment students at CUNY also exhibited a positive impact based on dual enrollment on their first semester GPA. The impact was less significant than was reported in the Florida study, at the 10% level, but dual enrollment participants' GPA was higher than their peers' GPA (Karp et al., 2007,

p. 46). The long term effects of the CUNY dual enrollment program on GPA were also not reported as significant; however, it was not reported as a negative influence either (Karp et al., 2007, p. 49).

In the same study, the NRCCTE researchers examined persistence among students in Florida and New York City. In Florida researchers found that participants in dual enrollment courses were 16.8% more likely to go to college than like students who did not participate in dual enrollment courses (Karp et al., 2007, p. 28). Researchers conducted a logistic regression of full-time students in the first term and also found that dual enrollment participants were significantly ($p < .01$) more likely to persist to a second semester than students who did not participate in dual enrollment courses (Karp et al., 2007, p. 30). The research also suggested long-term effects of student participation in dual enrollment coursework. Students in Florida who participated in dual enrollment coursework were 5.4% more likely to persist in college two years after graduation from high school when compared to their peers (Karp et al., 2007, p. 32). The same researchers further analyzed dual enrollment data obtained from The City University of New York and found that a student's persistence was not impacted by participation in dual enrollment classes; that is students who participated in dual enrollment were statistically no more likely to enroll in a second semester of college than students who did not participate in dual enrollment classes (Karp et al., 2007, p. 47). However, the study indicated that students who participated in dual enrollment courses at CUNY, after three and a half years, had earned significantly more college credits than students who did not participate in dual enrollment courses (Karp et al., 2007, p. 50).

Swanson (2008) also considered the impact of dual/concurrent credit on participants when compared to non-dual/concurrent credit participants. The study conducted by Swanson

entitled *An Analysis of the impact of High School Dual Enrollment Course Participation on Post-Secondary Academic Success, Persistence, and Degree Completion* examined the impact of dual/concurrent credit class on a first year college student's persistence to a second year of college when compared to students who had not previously completed dual/concurrent credit. The data for this study came from the National Educational Longitudinal Study 88/2000 (NELS) which consisted of a nationally representation sample of American students. The sample size of students without dual credit totaled 4,514 (Swanson, 2008). The study included both FTFGCS and non-first-generation college students. The comparison sample of students with dual credit totaled 425 (Swanson, 2008). Students entering two-year or four-year institutions were considered in the study. The study's primary variable was students' participation in dual/concurrent credit courses. Swanson (2008) found that students who had completed dual enrollment in high school and who completed 50 hours or more of college credit were more likely to persist to their second year of college. This finding was significant at the $p < .05$ level. The study went on to report that students who had completed dual credit coursework were significantly more likely, when compared to students who had no previous dual credit, to persist through their second year in college. Swanson (2008) reported that 69.9% of the students who had completed dual/concurrent credit classes were continuously enrolled compared to 64.1% of students who had not completed dual/concurrent credit classes. Swanson acknowledged that "dual enrollment participation may lay the groundwork for students to persist into the second year in college" (Swanson, 2008, p. 273).

The literature is suggestive that dual/concurrent credit coursework can positively impact students' postsecondary GPA and persistence. However, what appears to be absent is current

research that addresses the impact that dual/concurrent credit classes have on first-generation college students and how these courses can serve as a bridge to postsecondary education.

Summary

Postsecondary education is important to the success of our nation and the career aspirations of our citizens. While most students face challenges that make college access and success difficult, first-generation students must overcome additional barriers that make college matriculation and persistence to degree completion a daunting task. As the literature demonstrates, first-generation college students tend to have less support from family members, less knowledge of how higher education works, they face financial challenges, and they tend to be less academically prepared than their counterparts.

While barriers exist, making college difficult for first-generation students, various government programs have been developed to increase postsecondary educational opportunities. Research has shown that *TRIO* has improved first-generation students' persistence and success (Engle et al., 2006). *TRIO* programs have proven beneficial in offering first-generation students support system in preparation for postsecondary education.

Dual and concurrent credit classes have increased over the past century and their availability to students is expected to continue (Karp et al., 2007). Research has shown that dual and concurrent credit classes have emerged as a viable option to assist many students in a successful transition to college. The research examined in this chapter suggests that several positive benefits exist for college bound students that participate in dual/concurrent enrollment program. These courses may well provide important social and academic experiences that allow students to connect with higher education and aid their overall persistence. This has been documented by Astin (1999) and Tinto (1997). However, there is limited research regarding the

impact on first-generation college students. While dual and concurrent credit courses may well serve as a bridge linking students to academic success a lack of literature exists on the specific impact these courses have on first-generation students' persistence and academic performance in college.

CHAPTER III

METHODS

The purpose of this study was to determine if the completion of one or more dual credit or concurrent courses had a significant effect on full-time, first-generation, college students at the University of Arkansas (U of A). In addition, a demographic profile of FTFGCS for the cohorts examined was developed.

Three research questions were addressed in the study using quantitative methods. The questions are as follows:

1. What was the demographic profile of FTFGCS at the U of A based upon the following characteristics: gender, ethnicity, age, average ACT score, and average college hours earned prior to enrollment?
2. Did completion of a dual enrollment or concurrent credit class (minimum of three college credit hours) significantly impact FTFGCS' GPA after one year in college when compared to FTFGCS' GPA who had no prior dual enrollment or concurrent credit classes?
3. Did completion of a dual enrollment or concurrent credit class (minimum of three college credit hours) significantly impact FTFGCS' persistence after one year in college when compared to the FTFGCS who had no prior dual enrollment or concurrent credit classes?

This chapter includes a section on the research design, population and sample, data collection, data analysis, and chapter summary.

Research Design

The design of this study was in the nature of a non-experimental, correlational, quantitative exploratory research. Correlational research compares the relationship between two

or more variables and predicts outcomes. According to Creswell (2008) correlational research is intended to “measure the degree of association (or relationship) between two or more variables” (p. 356). In this study statistical outputs allowed the researcher to consider correlation and make predictions (Ary, Jacobs, & Razavieh, 1996). The results of correlational research do not prove causation, however it does measure influence (Marczyk, DeMatteo, & Festinger, 2005; Miller & Salkind, 2002). This research design was chosen to focus on the predictive relationship between FTFGCS who completed dual/concurrent credit classes and those who did not.

For purposes of this study, predictions of a higher GPA were made by comparing the GPA of FTFGCS with dual/concurrent credit to the GPA of FTFGCS without dual/concurrent credits. Persistence predictions were made by comparing dual/concurrent credit students’ re-enrollment with non-dual/concurrent credit students’ re-enrollment.

Variables

In this study, the independent variables considered were gender, ethnicity, age, ACT score, and number of college hours earned prior to enrollment. Gender was a dichotomous variable which included two categories: male or female. Ethnicity was binary either Caucasian or non-Caucasian. The grouping of ethnicity into two categories occurred due to the low number of students who were not Caucasian. Age was determined as the students’ age at the beginning enrollment of the third semester and consisted of students: 18 and below, 19, and those 20 and above. ACT was considered as a continuous independent variable. The number of college credit hours earned prior to enrollment was also considered as an independent variable. This was calculated based on the number of hours that each FTFGCS reported on their transcripts prior to entry into the University of Arkansas. Students not reporting one or more of the variables were excluded from the study. While conducting the statistical analysis during this study, the

independent variables were controlled by the ANCOVA, linear regression, and the logistic regression. The dependent variables in this study were defined to include FTFGCS' GPA and the FTFGCS' persistence after completing their first year of college at the University of Arkansas.

Population and Sample

The population for this study included students enrolled at the University of Arkansas who: (a) were first-time, first-generation college students; (b) enrolled during Fall 2004, 2005, 2006, 2007, and 2008; (c) entered the U of A with no other college credits other than those earned in dual/concurrent enrollment classes while in high school; (d) were full-time college students, defined as enrolled in 12 or more college credit hours; and (e) completed their initial fall and spring academic year. The population excluded students who began enrollment during spring or summer terms of any year. At the time data were requested from the University of Arkansas for this study, the most current first-to-second year data available was through fall 2008. The study focused on FTFGCS beginning in 2004 due to the relative newness of concurrent credit being offered to high school students in the State of Arkansas and the availability of data. The study included all students who graduated from high schools inside and outside of Arkansas. No transfer students were included in the study as they did not meet the study's criteria.

The initial data provided from the Survey Research Center included 12,054 students that were first-generation college students. Of that total population, 3,218 students were excluded because they were not full-time students both fall and spring semesters of their first year at the University of Arkansas which, left 8,836 students. However, 868 of the students did not report ethnicity, ACT score, or a combination of these variables and therefore were excluded from the study. None of the 868 students had previously completed a dual or concurrent credit class prior

to enrollment. A total population of 7,968 students met all the criteria to be included in the study. FTFGCS without dual/concurrent credit totaled 7,910, while a total of 58 FTFGCS earned dual/concurrent credit prior their first year attendance at the University of Arkansas.

Data Collection Procedures

The University of Arkansas Institutional Review Board (IRB) gave permission to begin collection of the data required for the study. See Appendix A for IRB Protocol Approval. A formal request was then made to the Survey Research Center (SRC) for the institutional data needed for the study. The SRC is the office responsible for providing institutional data for faculty, administrators, and students. This office was closed in 2011 and no longer exists after the University created a new office for Research and Economic Development.

The SRC application process consisted of providing a letter from the committee chair, a copy of the IRB application amendments and approval, the study's timeline, a signed confidentiality agreement, and a SRC billing form. The application included a copy of the dissertation proposal describing the data requested including the sample frame, size of sample, logic used to derive the sample size, and the list of variables desired. The following data were requested and obtained from SRC beginning each fall semester 2004 through fall of 2008: (a) all first time, first-generation college freshmen, those with dual and/or concurrent credit, and the number of hours; (b) each student's semester and year of enrollment at the University of Arkansas; (c) each student's total credit hour enrollment at the University of Arkansas for each semester of enrollment; (d) verification of each FTFGCS re-enrollment or non-enrollment at the University of Arkansas after completing their first academic year; (e) each student's GPA after completion of their first semester of college and the student's GPA after their first year of college

at the University of Arkansas; and (f) specific demographic information including: gender, ethnicity, age, high school attended, high school ACT score.

Upon receiving the data, each student was randomly assigned a number and all official university student identification numbers were eliminated as required under the confidentiality agreement with the SRC. All of the results from this study were reported in the aggregate and no individual students were identified.

Data Analysis Procedures

The foundation for this research was the descriptive statistics that were reported; gender, ethnicity, age, average ACT score, and average college hours. These demographics were included as a basis of the statistical procedures that follow. Means of descriptive statistics were compared using either a *t* test or Pearson's chi-square test. Students' GPAs were compared using ANCOVA and further analyzed through linear regression. The impact of dual and/or concurrent credit on persistence was analyzed by linear regression. STATA Data Analysis and Statistical Software was used to conduct the statistical analysis. The findings of this study are presented in Chapter IV using descriptions and tables.

Research Question 1: What was the demographic profile of FTFGCS at the University of Arkansas based upon the following characteristics: gender, ethnicity, age, average ACT score, and average college hours earned prior to enrollment?

Descriptive statistics were computed for 7,968 FTFGCS and for the 58 FTFGCS with dual/concurrent credit. Tables display the percent of: gender, ethnicity, age, average ACT score, and average college hours earned by FTFGCS prior to their fall enrollment at the University of Arkansas during the 2004-2008 school years. Demographic comparisons were made by

providing written descriptions of FTFGCS with and without dual/concurrent credit at the University of Arkansas 2004-2008. A *t* test or Pearson's chi-square test were calculated to compare the means and determine statistical difference or equality between dual/concurrent participants and students without dual/concurrent credit prior to enrollment.

Research Question 2: Did completion of a dual enrollment or concurrent credit class (minimum of three college credit hours) significantly impact FTFGCS' GPA after one year in college when compared to FTFGCS' GPA who had no prior dual enrollment or concurrent credit classes?

Research question two was analyzed by using ANCOVA. The ANCOVA statistical method was chosen to examine the influence of dual/concurrent credit on FTFGCS while controlling for the covariate effects of gender, ethnicity, age, and ACT score. In utilizing this statistical technique the mean GPA of FTFGCS with dual and concurrent credit was compared to the mean GPA of FTFGCS with no dual and concurrent credit. As a result, the researcher analyzed the F score, degrees of freedom, sum of squares, mean square, and the *p* value. The *p* value provided a number that indicated the impact of dual/concurrent credit on a FTFGCS grade point average.

A linear regression was used to determine the numerical increase in the GPA of students with dual and concurrent credit when compared to the GPA of students without dual and concurrent credit. This statistical method produces a numerical prediction of effect based the students' participation in dual/concurrent credit. Analysis of the coefficient provided the researcher with a numerical increase or decrease in students' GPA based on the variables. The significance level was computed and considered as well and confidence intervals were reported and analyzed.

Research Question 3: Did completion of a dual enrollment or concurrent credit class (minimum of three college credit hours) significantly impact FTFGCS' persistence after one year in college when compared to the FTFGCS who had no prior dual enrollment or concurrent credit classes?

A student's persistence in education after one year is a measure of full-time status of a student in the fall of second year. A student who persisted was assigned a score 1 and 0 otherwise. A logistic regression was conducted to find the likelihood of dual/concurrent credit participation in high school on a FTFGCS' persistence at the University of Arkansas. Several covariates/variables are used to control for other factors that might influence the persistence behavior. This test limits data bias and increases statistical power, thus controlling the variability associated with student differences (George Denny, personal communication, October 12, 2011). The logistic regression shows the probability of persistence over the probability of not persisting. The test compared the independent variables, FTFGCS with dual/concurrent credit and FTFGCS without dual/concurrent credit, along with each of these demographic variables: (a) gender; (b) ethnicity; (c) age; (d) average ACT score; where the dependent variable was the students' persistence after completing their first year of college. By analyzing the group differences, the researcher was able to determine if the FTFGCS group's prior experience with dual/concurrent credit course work increased the probability of college persistence.

Summary

The study used a non-experimental, correlational, quantitative exploratory research design to determine if the completion of either one or more dual credit or concurrent courses had a significant effect on full-time, first-generation college students entering the University of Arkansas during fall semesters 2004-2008. Descriptive statistics were also utilized to develop a demographic profile of the students included in the study.

Institutional data acquired for the study were provided by the University of Arkansas Survey Research Center. Data obtained included all full time (both fall and spring) first time first-generation college students enrolled at the University of Arkansas, beginning in the fall of 2004 through 2008. Students with dual and/or concurrent credit prior to enrollment were identified as a comparison group to all FTFGCS without dual and/or concurrent credit prior to their first year at the University of Arkansas. Basic descriptive statistics, gender, ethnicity, age, average ACT score, and number of college hours prior to enrollment, were reported. Students' GPA, and persistence and were analyzed using ANCOVA, linear regression, and logistic regression. Results were reported in Chapter IV in written and table form.

CHAPTER IV

DATA PRESENTATION AND ANALYSIS

The purpose of this study was to determine the impact that dual and concurrent credit classes have on the success of first-time, first-generation college students in the University of Arkansas at Fayetteville (U of A). More specifically, the study's focus was on examining the effect of dual and concurrent credit classes on FTFGCS: (a) first year GPA and (b) persistence from first-to-second year in college. In addition, a demographic profile of FTFGCS was also developed. Three research questions were posed as follows to guide the study:

1. What was the demographic profile of FTFGCS at the U of A based upon the following characteristics: gender, ethnicity, age, average ACT score, and average college hours earned prior to enrollment?
2. Did completion of a dual enrollment or concurrent credit class (minimum of three college credit hours) significantly impact FTFGCS' GPA after one year in college when compared to FTFGCS' GPA who had no prior dual enrollment or concurrent credit classes?
3. Did completion of a dual enrollment or concurrent credit class (minimum of three college credit hours) significantly impact FTFGCS' persistence after one year in college when compared to the FTFGCS who had no prior dual enrollment or concurrent credit classes?

To answer the above questions, institutional data were obtained from the U of A Survey Research Center (SRC). The data obtained included all first-time, first-generation college students (FTFGCS) who enrolled at the U of A during a fall semester from fall 2004-2008. Data provided by SRC included 12,054 students who reported to be FTFGCS enrolling at the U of A in the fall semester between 2004 through 2008. Of the 12,054 students, 3,218 were excluded

because they were not full-time students in the fall and/or spring of their first-year of college. An additional 868 students were excluded because they did not report ethnicity, ACT score, or both. None of the 868 students had previously completed a dual or concurrent credit class prior to enrollment. A total population of 7,968 students was used in the final data set. Out of the 7,968 students, 58 students had taken one or more dual/concurrent credit course(s) prior to enrollment, began in a fall semester between 2004-2008, and were full-time their first year, both fall and spring semesters at the U of A. Demographic information of the U of A is presented in the next section.

University of Arkansas Demographics

The University of Arkansas is a state land grant university founded in 1871 and is classified by the Carnegie Foundation as the only research institution in the state (University of Arkansas, 2012). The main campus is located in Fayetteville, Arkansas. To gain a better understanding of the context of the study, demographic information for the undergraduate student population is provided in this section. Table 1 reports total enrollment, gender, and ethnicity of the undergraduate UA student population. In fall 2011 the U of A reported a total undergraduate student enrollment of 19,027 students. The total UA enrollment, including graduate and professional students, was 23,199 for fall 2011. Of all undergraduate students enrolled, approximately 51% were male and 49% female. From an ethnic perspective, Caucasians comprised the majority of all undergraduate students, approximately 80%, and minorities and foreign students made up close to 20% of the student population. The largest non-Caucasian undergraduate enrollment was both African Americans and Hispanics, each at approximately 5.0% and followed by non-resident alien students at 3.1% (University of Arkansas, 2012).

Table 1

Total Undergraduate Enrollment, Gender, and Ethnicity of All Students at the University of Arkansas Fall 2011

Categories	Number	%
Fall 2011	19,027	100%
Gender		
Male	9,702	50.99%
Female	9,325	49.01%
Ethnicity		
African American	952	5.00%
American Indian/Alaska Native	269	1.41%
Asian	487	2.56%
Caucasian	15,172	79.74%
Hawaiian/Pacific Islander	19	0.01%
Hispanic	955	5.02%
Non-Resident Alien	587	3.09%
Two or More Races	532	2.80%
Unknown	54	0.28%

The vast majority (approximately 72%) of undergraduate students attending the University of Arkansas in fall 2011 were between the ages of 18 and 21. Students below age 18 made up 1% and those between the ages of 22 and 24 were approximately 16% of the student population at the U of A. Students age 25 and older made up almost 12% of the university's undergraduate population (see Table 2) (University of Arkansas, 2012).

Table 2

Age Distribution of Undergraduate Students at the University of Arkansas Fall 2011

Age	Number (N = 19,027)	%
Below 18	191	1.00%
18-19	7,604	39.97%
20-21	6,036	31.72%
22-24	2,958	15.55%
25 and older	2,238	11.76%

The average high school GPA of new freshmen students enrolled at the UA during the fall 2011 was 3.56 and the average ACT score was 25.7. Retention rates 2004-2008 averaged 82.2%. In 2011 the retention rate of first to second year students was reported as 83.5%. Students enrolled in August of the same period averaged 13.6 credit hours per semester (University of Arkansas, 2012).

Data Analysis Results

Three research questions guided this study in determining if dual and concurrent credit classes impact the GPA and first-to-second-year persistence of first-time, first-generation college students at the University of Arkansas at Fayetteville. The results of the analysis of data as they relate to each of the research questions are presented in this section.

Research Question 1: Demographics of FTFGCS

Research Question 1 stated: *What was the demographic profile of FTFGCS at the University of Arkansas based upon the following characteristics: gender, ethnicity, age, average ACT score, and dual/concurrent credit hours earned prior to enrollment?*

This section provides demographic information on the 7,968 FTFGCS enrolled at the University of Arkansas in their first fall and spring semesters during 2004-2008. Of the 7,968 FTFGCS, a total of 7,910 students had no dual enrollment or concurrent credits prior to enrollment at the University of Arkansas. Fifty-eight FTFGCS completed dual/concurrent credit classes prior to enrollment at the University of Arkansas, and were enrolled full-time both fall and spring semesters of their first year. The demographic variables in the study included: gender, ethnicity, age, average ACT score, and average college hours earned prior to enrollment.

Tests were conducted to determine likeness among FTFGCS with and without dual/concurrent credit. A Pearson chi-square test was performed to test the independence between/among groups or categories, and a *t* test was used to examine the difference in means of continuous variables between the dual/concurrent and the non-dual/concurrent full-time students (see Appendix B).

Gender

Tables 4 and 5 contain the gender of FTFGCS with and without dual/concurrent credit prior to enrollment at the University of Arkansas. Females comprised the majority enrollment of both groups. Of the 58 students who completed dual/concurrent credit classes prior to enrollment, almost 59% were female and 41% were male (see Table 4). Of the 7,910 students without dual/concurrent credit prior to enrollment, females constituted 54% of the students while males made up approximately 46% of the FTFGCS enrollment (see Table 5).

Table 4

Gender of FTFGCS with Dual/Concurrent Credit Prior to Enrollment

Gender	Total N = 58	%
Male	24	41.38%
Female	34	58.62%

Note. Independence test by gender: $\chi^2 (1) = 0.49$ $p = .482$

Table 5

Gender of FTFGCS without Dual/Concurrent Credit Prior to Enrollment

FTFGCS Gender With dual/concurrent	Total N = 7,910	%
Male	3,635	45.95%
Female	4,275	54.05%

Note. Independence test by gender: $\chi^2 (1) = 0.49$ $p = .482$

Ethnicity

Ethnicity was another demographic characteristic examined in the study. Tables 6 and 7 present the ethnic enrollment distribution of FTFGCS with and without dual/concurrent credit. In both tables, Caucasians made up almost 90% of all full-time, first-generation students at the University of Arkansas. For students with prior dual/concurrent credit, no other ethnic group had more than three total students (see Table 6).

African American students made up approximately 4% (317 students) and Hispanic students made up 2.5% (198) of the FTFGCS with no dual/concurrent credit prior to enrolling at the University of Arkansas. Both Asian students (2.36%) and American Indians (2.17%) comprised slightly over 4.5% of all of the non-dual/concurrent credit FTFGCS.

Table 6

Ethnicity of FTFGCS with Dual/Concurrent Credit Prior to Enrollment

Ethnicity	Number (N = 58)	%
Caucasian	52	89.66%
African American	0	0.00%
Hispanic	1	1.72%
Native Hawaiian - Pacific Islander	0	0.00%
American Indian / Alaskan Native	0	0.00%
Asian	2	3.45%
Foreign	0	0.00%
Unknown ethnicity	3	5.17%
Two or more	0	0.00%

Table 7

Ethnicity of FTFGCS without Dual/Concurrent Credit Prior to Enrollment

Ethnicity	Number (N = 7,910)	%
Caucasian	6,917	87.45%
African American	317	4.01%
Hispanic	198	2.50%
Native Hawaiian - Pacific Islander	5	0.06%
American Indian / Alaskan Native	172	2.17%
Asian	187	2.36%
Foreign	19	0.24%
Unknown ethnicity	76	0.93%
Two or more	19	0.24%

Age

Tables 8 and 9 report the age of first-time, first-generation colleges students included in the study. Thirty-six of the 58 students who had completed one or more dual/concurrent credit classes were 18 years or below (62.07%), while the approximately 38% of the students were 19 years old. There were no students with dual/concurrent credit who were 20 and above (see Table

8). Of the 7,910 FTFGCS without any dual/concurrent enrollment credits, 60.07% were 18 years or less, while students age 19 made up almost 38% of this group (see Table 9).

Table 8

Age of FTFGCS with Dual/Concurrent Credit Prior to Enrollment

Age	Number (N = 58)	%
18 and below	36	62.07%
19	22	37.93%
20 and above	0	0%

Table 9

Age of FTFGCS without Dual/Concurrent Credit Prior to Enrollment

Age	Number (N = 7,910)	%
18 and below	4,786	60.50%
19	3,030	38.31%
20 and above	94	1.19%

The average age of all FTFGCS was slightly over 18 years old. Those students with dual and/or concurrent credit classes the mean age was 18.33 with a standard deviation of .57. For FTFGCS without dual/concurrent credit, the mean age prior to enrollment was 18.43 with a standard deviation of .78 (see Table 10).

Table 10

Mean and Standard Deviation Age of FTFGCS with and without Dual/Concurrent Credit Prior to Enrollment

Students	N	M	SD
FTFGCS with dual/concurrent	58	18.33	.57
FTFGCS without dual/concurrent	7,910	18.43	.79

Note. Independence test by age: $t = .96$ $p = .34$

ACT

The ACT scores of FTFGCS are provided in Table 11. The mean composite ACT score of the 7,910 FTFGCS without dual/concurrent credit was 25.19 with a standard deviation of 3.99, compared to the mean ACT composite score of 28.12 and a standard deviation of 3.72 for the 58 FTFGCS with dual and/or concurrent credit classes. A t test was conducted and revealed a significant difference between FTFGCS with dual/concurrent credit and FTFGCS without dual/concurrent credit.

Table 11

Mean and Standard Deviation ACT score of FTFGCS with and without Dual/Concurrent Credit Prior to Enrollment

ACT	FTFGCS without dual/concurrent	FTFGCS with dual/concurrent
N	7,910	58
M	25.19	28.12
SD	3.99	3.72

Note. Independence test by ACT: $t = -5.58$ $p = 0.00$

Dual/Concurrent Credit Earned

The final descriptive statistic examined in the study was the number of college credit hours FTFGCS earned through either dual and/or concurrent credit courses. Approximately 41% of first-time, first-generation students earned three credit hours in dual enrollment or concurrent credit coursework prior to enrollment. A total of 20 students (34.48%) earned between four and eight hours of credit prior to enrollment in dual/concurrent courses. Somewhat surprisingly, 15.51% (12 students) earned between 11 and 21 hours of credit prior to enrollment (see Table 12).

Table 12

FTFGCS Dual/Concurrent Credit Hours Earned Prior to Enrollment

Total dual/concurrent hours earned	Number of students (N = 58)	%
3	24	41.38%
4	2	3.45%
5	1	1.72%
6	7	12.07%
8	10	17.24%
9	2	3.45%
11	3	5.17%
12 or more hours	9	15.51%

Table 13 presents the mean and standard deviation of dual/concurrent credits earned prior to enrollment by FTFGCS. The mean for all FTFGCS was 6.8 and the standard deviation among the 58 FTFGCS with previous dual/concurrent credit was 4.57.

Table 13

Mean and Standard Deviation of FTFGCS Dual/Concurrent Credit Earned Prior to Enrollment

Variable	N	M	SD
Previous college credit (hours)	58	6.8	4.57

Demographics Summary

First-time, first-generation students at the University of Arkansas who earn dual or concurrent credits prior to enrollment are more likely to be female. Ethnically, FTFGCS were primarily Caucasian. In fact, 87% of all the students included in the study were Caucasian and 89% of all FTFGCS with dual/concurrent credit were Caucasian. Minorities made up just over 12% of the students and just 10% of FTFGCS with dual/concurrent credit. The average age of FTFGCS with and without dual/concurrent credit was 18 and FTFGCS age 20 and older comprise approximately 1%. FTFGCS with previous college credit averaged 28 on the ACT compared to an average of 25 scored by FTFGCS without dual/concurrent credit. The number of college credits earned prior to entry into the University of Arkansas varied. Just over 40% of FTFGCS with dual/concurrent credit students had earned three hours 3 hours of credit and almost 35% of students entered the university with between four to eight hours of dual/concurrent credit. FTFGCS had a mean of 6.8 hours of dual/concurrent credit earned prior to enrolling at the university.

Research Question 2: Dual/Concurrent Credit Effect on GPA

Research Question 2 stated: *Did completion of a dual enrollment or concurrent credit class (minimum of three college credit hours) significantly impact FTFGCS' GPA after one year in college when compared to FTFGCS' GPA who had no prior dual enrollment or concurrent credit classes?*

After their first year in college, the GPA of 7,910 FTFGCS without dual/concurrent credit was compared to the GPA of 58 FTFGCS with dual/concurrent credit. An ANCOVA was used to calculate the statistical difference on FTFGCS' GPA between those who completed dual/concurrent credit classes and those who did not. In the model (dual/concurrent, ethnicity,

age, and ACT) 7,910 FTFGCS without previous dual and/or concurrent credit were compared to the 58 students who had previously completed dual and/or concurrent credit classes. A linear regression was conducted to determine the average numerical effect of dual/concurrent credit hour on students' GPA.

ANCOVA/Linear Regression

As a result of computing an ANCOVA, the model was responsible for a partition of the overall FTFGCS' GPA. The R-squared value was calculated as .1837, thus indicating the model accounted for 18% of the variation in GPA due to the variables *dual/concurrent credit, age, gender, race, and ACT scores*. The partial sum of squares was .62 for age, 34.08 for female, .38 for non-Caucasian, and 729.99 for ACT scores. The partial sum of squares of dual/concurrent was responsible for 9% of the variability in the GPA of FTFGCS with dual/concurrent credits although it was not significant (see Table 14). After the ANCOVA, a linear regression model was run to calculate the numerical impact of dual/concurrent credit, age, gender, ethnicity, and ACT score variables on first-year GPA. A test of linear regression was computed and, although statistically insignificant, revealed a .04 increase in students' GPA as a result of completing dual/concurrent credit classes. Age had a positive .02 impact on students' GPA but was also insignificant. Female students who had completed dual/concurrent credit had .13 higher GPA, and this finding was found significant at the .05 level. Ethnicity was not found to be a significant factor in explaining students' GPA. However, students' ACT score reported a .08 increase in students' first year GPA, and was significant at the .05 level (see Table 15).

Table 14

ANCOVA for FTFGCS with and without Dual/Concurrent Credit

Scale	S.S.	df	M.S.	f ratio	p(F)
Model	754.48	5	150.93	359.61	.00
Dual/Concurrent	.09	1	.09	.21	.65
Age	.62	1	.62	1.47	.22
Female	34.08	1	34.08	81.20	.00
Non-Caucasian	.38	1	.38	.90	.34
ACT	729.99	1	729.99	1739.27	.00
Total	4096.44	7967	.51		

Table 15

Linear Regression Model Reporting Increase in FTFGCS' GPA as a Result of Dual/Concurrent Credit

Variable	Coef.	Std. Err.	Signif.	[95% Conf. Interval]	
Dual/concurrent	.04	.09	.65	-.12	.21
Age	.02	.01	.23	-.01	.05
Female	.13	.01	.00	.10	.16
Non-Caucasian	.02	.02	.34	-.02	.06
ACT	.08	.00	.00	.07	.08

Summary

An ANCOVA was computed to determine the effect of dual/concurrent credit on students' GPA. The test showed that student participation in dual/concurrent credit classes accounted for .09 of the FTFGCS' GPA. A linear regression was then computed to calculate the expected increase in GPA resulting from earning dual/concurrent credits. Although the results were not found to be significant, the model reported a participant in dual/concurrent credit could expect a .04 increase in GPA.

Research Question 3: Dual /Concurrent Credit and Persistence

Research Question 3 stated: *Did completion of a dual enrollment or concurrent credit class (minimum of three college credit hours) significantly impact FTFGCS' persistence after one year in college when compared to the FTFGCS who had no prior dual enrollment or concurrent credit classes?*

Logistic Regression

A logistic regression model was used to compare the persistence of all FTFGCS with and those without dual/concurrent credits earned prior to enrollment from their first-year to their second-year of attendance at the university. The total number of FTFGCS was 7,968; and 58 FTFGCS participated in dual or concurrent classes prior to entry into the University of Arkansas. Of those initial 58 students, 55 persisted to the fall semester of their second year.

The model (dual/concurrent credit, gender, age, non-Caucasian, and ACT) was computed using only students who were full-time for two consecutive semesters beginning each fall. The purpose of the test was to estimate the likelihood that a dual and/or concurrent student would be enrolled as a full-time student for a third semester, which was termed as persistence. The logistic regression statistic indicated that students who completed dual and/or concurrent credit classes were 9.1% more likely to register as full-time students in the second fall semester than full-time FTFGCS who had not previously completed dual and/or concurrent credit classes. When gender was added to the model, the logistic regression showed a 9% likelihood of FTFGCS with dual/concurrent credit persistence. When age and gender were added to the model, minimal change occurred in the likelihood of FTFGCS' persistence. Adding race had minimal impact; however, when ACT was included in the model, the likelihood of persistence of FTFGCS with dual/concurrent credit was lowered to 6.4% (see Table 16).

Table 16

Logistic Regression for Persistence of FTFGCS with and without Dual/Concurrent Credit

Variable	Logistic Regression Coefficients				
	1 Variable Model	2 Variable Model	3 Variable Model	4 Variable Model	5 Variable Model
Dual/concurrent	.091***	.090***	.089***	.089***	.064*
Gender (female)	-	.040***	.038***	.037***	.046***
Age	-	-	-.019***	-.019***	-.015**
Non Caucasian	-	-	-	-.035***	-.008
ACT	-	-	-	-	.014***

Note. *** indicates significant at 1% level (alpha = 0.01)
 ** indicates significance at 5% level (alpha = 0.05)
 * indicates significance at 10% level (alpha = 0.10)

Summary

The persistence of FTFGCS was measured using a logistic regression model. The results expressed the likelihood that a dual and/or concurrent student would persist to a third semester. It was reported that without considering any other variables, students with dual/concurrent credit were 9.1% more likely to persist to a second year of college. When controlling for the effects of gender, ethnicity, age, and ACT, the results indicated that FTFGCS would be 6.4% more likely to persist when compared to FTFGCS without dual/concurrent credit. Note results of first generation students with dual/concurrent credit were significant at a minimum of $p < .10$ as each variable was controlled.

Chapter Summary

The results of this study provided the basis for addressing the three research questions posed. The results provided the data necessary to provide a demographic summary of University of Arkansas first-time, first-generation college students. The results of the ANCOVA were used to calculate the partition of variability of FTFGCS' GPA as a result of earning dual/concurrent credit. A linear regression was coupled with the ANCOVA to compute the numerical value on

GPA of FTFGCS' completion of dual/concurrent credit. A logistic regression was used to determine the effect of dual/concurrent credit on student persistence. These results are summarized and reported.

FTFGCS at the University of Arkansas were the focus of the study. Females made up 54% of the all FTFGCS' fall enrollment, males made up 46% between the 2004 and 2008. First-generation students with dual/concurrent credit were found to be 59% female and 51% male. Ethnicity was also considered. Caucasians made up the majority of FTFGCS (87%) as well as the majority of FTFGCS with dual/concurrent credit (89%).

With a basic understanding of the population's demographics, an ANCOVA and linear regression were computed to consider the impact of dual/concurrent credit on students' GPA. The ANCOVA found the model (including all variables) to be responsible for 18% of the variation in students' GPA. Significance was reported at the $p < .05$ level. The linear regression reported the numeric increase or decrease in GPA that students with dual/concurrent credit could expect after controlling for gender, ethnicity, age, and ACT. Analysis of linear regression results revealed that students with dual/concurrent credit could expect a .04 increase in GPA although the results were not significant at any level.

After considering the impact on GPA, the study focused on the effects of dual/concurrent credit on persistence. A logistic regression was used to calculate the likelihood that FTFGCS with dual/concurrent credit would persist. The results led to the conclusion that first generation students were 6.4% more likely to persist. This result was significant at the $p < .10$ level.

These results will enable comparison with previous studies in a future chapter. They offer a glimpse of the demographics of first generation students at the University of Arkansas and the impact that dual/concurrent credit has on their GPA and persistence.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

A national educational imperative exists for the U.S. to increase substantially the number of college graduates over the next 10 years. To achieve this goal, more students whose parents did not attend college must complete high school, matriculate to postsecondary education, and persist to graduation. The American Association of State Colleges and Universities (2012) stated: "... institutions [need to] enroll significant numbers of low-income and first-generation students. Ensuring that these students are college ready is important, but just as important is having a substantially supportive environment at the postsecondary level" (p. 19). This is a big challenge since many first-generation college students are considered academically at-risk and face many difficult obstacles to persist and graduate from a college or university.

This study attempted to determine the impact that completing dual and concurrent credit coursework had on the persistence and academic success of first-time, first-generation college students. This final chapter presents an overview of the study results, discussion and conclusions, limitations, and recommendations for future study and improved practice.

Overview of the Study Results

The purpose of this study was to consider the impact of dual/concurrent credit on first-generation students' GPA and their first-to-second year persistence at a public, land-grant, highly intensive research institution. In addition, the demographic information of FTFGCS with and without prior dual/concurrent credit was reported. Students included in the study were first-time, first-generation college students at the University of Arkansas, who enrolled during a fall semester between the years 2004 and 2008. To be considered as enrolled full-time, students had to be enrolled in no fewer than 12 college credit hours for two consecutive semesters (fall first

year, spring first year) after their initial enrollment. Students whose initial enrollment point at the University of Arkansas was a spring semester, or a summer session were excluded from the study.

The Survey Research Center (SRC) at the University of Arkansas provided the institutional data analyzed in this study. Data used in the study included the following: gender, ethnicity, age, ACT score, and college credit prior to enrollment at the University of Arkansas, students' GPA at the end of the second semester, and enrollment status for the following fall semester after completion of the students' first year. Students with missing demographic data were excluded from inclusion in the study. Students entering the university during the delineated time frame (fall 2004 – fall 2008) and who further met the other selection criteria consisted of 7,968 full-time, first-generation college students, 58 of whom had completed three or more hours of dual or concurrent credit prior to enrollment at the University of Arkansas. A summary of the results of the study organized by the research questions is presented below.

Research Question 1: What was the demographic profile of FTFGCS at the University of Arkansas based upon the following characteristics: gender, ethnicity, age, average ACT score, and average college hours earned prior to enrollment?

The study's foundation was based largely upon the demographics of FTFGCS who initially enrolled at the University of Arkansas during a fall semester between 2004 and 2008. FTFGCS without dual/concurrent credit were overwhelmingly Caucasian (87%) and slightly more likely to be female (54%). Dual or concurrent credit students were also primarily Caucasian (90%) and female (59%). African American students were the largest percentage of all other ethnic groups totaling 4% of the overall FTFGCS population. However, no African

American FTFGCS earned any dual/concurrent credits. Collectively, Hispanic and Asian FTFGCS made up 4.86% of the non-dual/credit students.

Age was another demographic characteristic considered. There was little difference in age between those FTFGCS with or without dual/concurrent credit. Approximately 99% of all first-generation college students were 19 or younger, and all FTFGCS with dual/concurrent credit were 19 years of age or younger.

The study also examined the demographic characteristic of ACT scores and number of dual/concurrent credits earned prior to admission. FTFGCS with dual/concurrent credit reported a mean ACT score of 28.12 compared to FTFGCS without dual/concurrent credit that had a mean ACT of 25.19. Finally, of those students with credits prior enrollment, the mean number of credits earned was 6.8. Comparisons were made using *t test* or Pearson's chi-square test to determine any statistical differences between dual/concurrent participants and students without dual/concurrent credit prior to enrollment. Chi square and *t* tests were conducted, and the results revealed a significant difference in ACT scores among FTFGCS.

Research Question 2: Did completion of a dual enrollment or concurrent credit class (minimum of three college credit hours) significantly impact FTFGCS' GPA after one year in college when compared to FTFGCS' GPA who had no prior dual enrollment or concurrent credit classes?

The GPA of FTFGCS was examined using ANCOVA and linear regression. The ANCOVA showed variation in students' first year GPA as a result of their completion of dual and/or concurrent credit coursework. The results indicated that the model comprised of *dual and concurrent credit, age, gender, race, and ACT scores* accounted for 18% of the overall impact. A linear regression then identified the numerical impact of dual/concurrent credit on the GPA of

FTFGCS. Although statistically insignificant, dual/concurrent showed a .04 increase in FTFGCS' GPA.

Research Question 3: Did completion of a dual enrollment or concurrent credit class (minimum of three college credit hours) significantly impact FTFGCS' persistence after one year in college when compared to the FTFGCS who had no prior dual enrollment or concurrent credit classes?

The final research question focused on the impact that dual/concurrent credit has on FTFGCS' persistence from their first-to-second year in college. A logistic regression compared the persistence of all FTFGCS who had previously completed dual and/or concurrent credit classes with FTFGCS who had not previously completed dual and/or concurrent credit classes. The logistic regression indicated that students who completed dual and/or concurrent credit classes were 6.4% more likely to register as full-time students in the fall semester of their second year at the university. The finding was significant at the $p < 0.10$ level, indicating that dual/concurrent credit does have an impact on FTFGCS' persistence.

Discussion and Conclusions

This study focused on determining whether completion of dual/concurrent credit coursework impacts the GPA and persistence of FTFGCS. This section presents a discussion of the findings and conclusions.

Research Question #1:

The focus of the first research question was on the characteristics of first-generation college students. The findings of the study were compared with prior research. A national study was conducted by the National Center for Educational Statistics in 2001 and with a follow-up study in 2005. NCES utilized a sample of 12,000 first-generation college students to construct a

demographic profile of first-generation students across the country (NCES, 2001). The NCES study established a basis for understanding the demographics of first-generation college students in this study, and further serves as a comparison for analysis. The demographics of the FTFGCS in this current study were obtained through institutional data maintained by the University of Arkansas and included gender, ethnicity, age, average ACT score, and average college hours earned prior to enrollment.

In 2001, NCES reported females made up 58% of first-generation college students (NCES, 2001). The NCES (2005) follow-up study reported similar findings with females comprising 60% of the first-generation student population. The current study reported that 54% of FTFGCS without dual/concurrent credit were female; 59% of FTFGCS with dual/concurrent credit were female. The findings between the literature and the present study were similar for gender. It should be noted however, that when comparing the gender of FTFGCS to the entire university undergraduate enrollment, differences are evident. In fall 2011, 49% of all undergraduates at the University of Arkansas were female (University of Arkansas, 2011) compared to 59% of FTFGCS with dual/concurrent credit.

Prior studies have reported ethnicity of first-generation college students as primarily Caucasian, 61.3% (NCES, 2001). However, the results of the present study found that Caucasian FTFGCS made up over 87% of those with and without dual/concurrent credit. NCES (2001) reported the largest category of minorities was Hispanic at approximately 18%, followed by African American at approximately 14%. In contrast, the present study found only five out of the 58 total full-time, first-generation that had earned dual/concurrent credit prior to enrollment were a minority. Of the students in this study that had not earned dual/concurrent credit, 4.01% were African-American, 2.5% Hispanic, and 2.36% were Asian. These findings lead to the conclusion

that the University of Arkansas has a relatively low number of minorities applying for admission and that have taken dual/concurrent credit courses while in high school. One explanation for this was reported in a state profile which found variability and inconsistent implementation of dual and concurrent credit in Arkansas. (Barnett & Kim, 2006).

The current study revealed that almost 99% of FTFGCS entering the University of Arkansas between 2004 and 2008 without dual/concurrent credit were 19 years old or younger. One hundred percent of the FTFGCS with dual/concurrent credit earned prior to entry to the University of Arkansas were age 19 and below. Previous research has found that first-generation college students tend to be older than students who are not first-generation. NCES (2001) reported that 71% of first-generation students were 18 years of age or younger, compared to 82% of non-first-generation students.

Previous research has indicated that first-generation college students enter college with lower ACT scores than non-first-generation college students (NCES, 2005). The demographic characteristics from the present study revealed that FTFGCS with dual credit scored an average ACT score of 28.1 while students without dual/concurrent credit scored an average of 25.2. The University of Arkansas reported that students enrolled in during the period of fall of 2011 through fall 2008 scored an average of 25.5 on the ACT. Thus ACT scores for all FTFGCS entering the University of Arkansas were similar to the average ACT scores of non-first-generation college students entering the university. In contrast, FTFGCS with dual/concurrent credit who entered the University of Arkansas had higher average ACT scores than their counterparts.

A conclusion that can be drawn based on this present study and the literature is that full-time, first-generation college students attending the university have comparable ACT scores to

non-first-generation freshman at the University of Arkansas. For automatic admission, the University of Arkansas requires a 3.00 GPA and a score of 20 or higher on the ACT. It can further be concluded that most FTFGCS with dual/concurrent credit attending the University of Arkansas are academically prepared for the rigors of college and very few academically at-risk students take dual/concurrent credit coursework.

Research Question #2:

In a 2012 study, Hinojosas and Salinas found that students with prior dual/concurrent credit had higher GPA than students without dual/concurrent credit. In another study, Duffy (2009) investigated the effects of dual credit on students' GPA. When controlling for pre-entry factors, Duffy found no significant difference in the GPA of students with prior dual credit when compared to students without previous dual credit (Duffy, 2009). Swanson (2003) considered how participation in concurrent credit classes affected students' persistence and GPA when compared to students who did not complete concurrent credit classes. Swanson found that concurrent students with prior concurrent credit had significantly higher GPAs than students who had not completed concurrent credit classes. Finally, a study conducted by *The National Center for Career and Technical Education (NCCTE)* considered the impact of dual credit on students' GPA and persistence. The study revealed that dual enrollment participants' college GPA were significantly higher than their peers one year after high school graduation. Students who participated in dual enrollment courses earned GPAs that remained statistically higher than that of their peers after two years of college as well as after three years (Karp et al., 2007). In the same study but a different sample, dual enrollment students at *The City University of New York (CUNY)* also exhibited the positive impact of dual enrollment on their first semester GPA.

In comparison, the results from this present study found no significant effect on FTFGCS' GPA after their first year in the university as a result of earning dual/concurrent credit prior to enrollment. The ANCOVA test showed that when all variables (dual/concurrent, gender, ethnicity, age, and ACT) were considered, dual/concurrent credit accounted for only .09 of the variation in students' first year GPA. This finding was not statistically significant. A linear regression was utilized to calculate the impact of dual/concurrent credit on first-year GPA, after accounting for gender, ethnicity, age, and ACT. After including all variables, the results revealed a .04 increase in students' GPA as a result of completing dual/concurrent credit classes, again, however, the results were not significantly significant.

Based on the current study and previous literature, it can be concluded that there is little difference in the demographic characteristics and academic preparedness of full-time, first-generation students and all other full-time freshmen students entering the University of Arkansas. As a result, participating in dual/concurrent courses prior to admission may not affect students' first-to-second year GPA.

Research Question #3:

Hinojosas and Salinas (2012) in their study on student persistence reported that students with previous college credit were 2.7% more likely to persist after their first year in college when compared to students without previous college credit. Overall, these researchers reported that students with prior college credit were significantly more likely to persist, and in fact were 20.1% more likely to persist, than students who did not have prior college credit (Hinojosas & Salinas, 2012). In another study, McCormick (2011) considered the relationship between demographic variables and dual credit participation on persistence. McCormick reported that 95% of the dual credit participants were enrolled in a four-year institution and that "most of the

students were on track to persist toward program completion, beginning in both 2 year and 4 year colleges/universities” (p. 84). McCormick further reported that of all students who entered two-year colleges (n = 51), 96% persisted for two terms. Of the students who entered four-year colleges (n = 283), 90% persisted for four terms (McCormick, 2011). In a different study, Harrington (2005) calculated the impact of dual/concurrent credit coursework on persistence. Statistical tests were used to predict persistence. Harrington reported that dual/concurrent credit did impact persistence; it was found that dual/concurrent credit participants were twice as likely to persist when compared to non-dual concurrent credit participants. The study noted that 84% of students with dual/concurrent credit persisted into a second year while non-dual/concurrent credit participants’ persistence rate was 71.1% (Harrington, 2005). Swanson (2008) studied the persistence of community college students. He concluded that completing concurrent credit classes prior to enrollment increased persistence at a greater rate when compared to non-concurrent credit students. Swanson went on to explain that an analysis over the seven-year period yielded significantly higher retention rates among students who completed concurrent credit coursework when compared to non-concurrent credit students. Finally, *The National Center for Career and Technical Education (NCCTE)* conducted statistical analysis on persistence for students enrolled in college in Florida and students at The City University of New York (CUNY). Researchers conducted a logistic regression of full-time students in the first term and found that dual enrollment participants were significantly ($p < .01$) more likely to persist to a second semester than students who did not participate in dual enrollment courses (2007, p. 30). The NRCCTE research also found long-term effects of student participation in dual enrollment coursework. Students in Florida who participated in dual enrollment coursework were 5.4% more likely to persist in college two years after graduation from high school when compared to

their peers (Karp et al., 2007). At the same time, however; researchers also analyzed dual enrollment data obtained from The City University of New York and found that students' persistence was not impacted by participation in dual enrollment classes; that is students who participated in dual enrollment were statistically no more likely to enroll in a second semester of college than students who did not participate in dual enrollment classes. However, the study found that students who participated in dual enrollment courses at CUNY, after three and a half years, had earned significantly more college credits than students who did not participate in dual enrollment courses (Karp et al., 2007).

Similar findings were reported in FTFGCS' persistence as a result of this present study. Research Question 3 posed the question of what effect does dual/concurrent credit coursework have on the likelihood that a dual and/or concurrent student would be enrolled as a full-time student for a third semester. This was also the definition of persistence in this present study. The logistic regression indicated that FTFGCS were 6.4% more likely to continue as full-time students in their second fall semester and this finding was statistically significant at the $p < 0.10$ level. It can be concluded from the literature and findings of this study that if dual/concurrent credit coursework programs were made available to a larger number of academically at-risk students, these courses could help first-generation students make a more successful transition to higher education. Previous research has shown that dual/concurrent coursework, depending on demographics, can positively impact both college GPA and persistence.

Limitations

As with all studies, efforts were made to minimize limitations, however several existed in this study. The first limitation was that this study included only one campus, with a selective admission policy and limited minority enrollment. As such, the University of Arkansas may not

be representative of many campuses where first-generation college students begin their academic career. This limitation may affect the generalizability of the findings to institutions unlike the University of Arkansas.

A second limitation was the small number of FTFGCS who earned dual/concurrent credits prior to enrollment at the University of Arkansas. Of the 7,968 full-time, first-generation students included in the study, only 58 had earned dual/concurrent credits before enrollment. This relatively small number may affect the generalizability of the results to other institutional contexts.

A final limitation is that this study did not include part-time, first-generation college students nor did it consider students whose initial enrollment at the University of Arkansas was during a spring semester or a summer session. Additionally, the study was limited to students that enrolled in the university over a five period (2004-2008).

Recommendations for Future Research

Increasing the number of students entering into postsecondary education is of great importance to our nation's future. Unfortunately, a limited amount of research exists as to whether dual/concurrent credit coursework can serve as a viable bridge to connect first-generation college students with higher education. This section presents several recommendations for future research.

Future research needs to be directed specifically on what benefits academically at-risk, first-generation students might gain by taking dual enrollment and concurrent credit courses. At present, many academically at-risk, first-generation students face numerous obstacles in matriculating to college, persisting, and graduating. In addition to studying the outcome measures of GPA and persistence, future research could also focus attention on non-cognitive

measures such as positive self-concept/confidence, realistic self-appraisal, and understanding of the need for long-term goals.

Another recommendation is that a series of national studies be conducted to examine first-generation students and the effect that earning dual/concurrent credits has on their GPA and persistence. These studies might, for example, be expanded to a national sample of students from similar types of institutions with similar student demographics.

A final recommendation would be to conduct a longitudinal study at the University of Arkansas that examines the impact of dual/concurrent credit beyond one year. By following students beyond and analyzing students' GPA and persistence, statistical tests could be conducted and comparisons made to consider the impact beyond a single year. Of equal importance would be the analysis of graduation in relation to persistence, giving the researcher, practitioners, and public policy advocates the necessary information as future policy is developed and implemented.

Recommendations for Practice and Policy

Previous research and the current study support the notion that dual/concurrent credit may increase FTFGCS' likelihood of postsecondary success. Thus a recommendation would be to require high schools and postsecondary schools to identify and track FTFGCS beginning their sophomore year of high school and ending after dropping from postsecondary school or completion of a degree. This would benefit FTFGCS by providing advocates and accountability. The requirement would also provide accountability for the high schools and postsecondary institutions to increase the number of students attending and succeeding in postsecondary institutions.

Historically, high schools are responsible for test scores, attendance, and ultimately student graduation. It is recommended that high schools develop percent goals for postsecondary access of identified FTFGCS. Once at postsecondary institutions, FTFGCS are often forgotten. Therefore, postsecondary schools should also track FTFGCS and develop expected goals to increase FTFGCS' postsecondary persistence.

Another recommendation would be for the state of Arkansas to expand dual/concurrent credit opportunities for all students. Research has shown the positive impacts on postsecondary success in part because of participation in dual/concurrent credit courses. As supported by research and the current study, more opportunities are likely to increase student persistence in college.

FTFGCS often lack the confidence that it takes to enroll in postsecondary institutions. Often, they do not understand that postsecondary success is within their reach. By requiring students in high school to complete at least one dual/concurrent credit course, be enrolled in International Baccalaureate coursework, access Advanced Placement classes, or other postsecondary educational opportunities, all students will gain experience in postsecondary education. This may provide the bridge which will motivate pursuit of postsecondary education.

The study also shed light on the limited number of minorities attending the University of Arkansas with even less accessing dual/concurrent credit. With the documented positive effects on student participation in dual/concurrent courses, it would seem clear that colleges and universities must find ways to increase minority enrollment. Therefore, high schools and postsecondary institutions must increase recruitment of minorities, and because of the benefits, encourage more minorities to access dual/concurrent credit classes.

Parents are sometimes overlooked when information is provided. It would be beneficial to all to require high schools to educate all parents on the benefits of dual/concurrent credit courses. Parental and student understanding of the opportunities that could lead to postsecondary access are critical to students having the confidence to enroll and attend postsecondary institutions.

Summary

While there are numerous studies that purport to analyze the effect of programs that provide opportunities for FTFGCS, there are limited studies that focus specifically on the benefits that dual/concurrent credit coursework taken by high school students can have on academic success and persistence. The purpose of this study was to determine if the completion of either one or more dual or concurrent courses had a significant effect on the persistence of full-time, first-generation college students at the University of Arkansas from their first-to-second year. This study provides some evidence that dual/concurrent credit courses can provide a positive benefit to high school students as they make the transition to higher education.

Alene Russell, Senior State Policy Consultant for the American Association of State Colleges and Universities stated:

There is no doubt that significant challenges lie ahead if the nation is to meet ... the goal of having the highest proportion of college graduates by 2020. Whether that goal can be met remains to be seen, but significant progress can and must be made if the nation is to remain competitive in the global economy. (2011, p. 4)

If in fact the U.S. is to meet its national college degree completion goal, many more first-generation college students must successfully matriculate to postsecondary education. All educational institutions should do everything possible to encourage more first-generation students to take college-level coursework while in high school. The opportunities provided through dual/concurrent credit courses may provide students with a better understanding of the

rigors of higher education and the sense that they too can succeed. In this regard, dual/concurrent coursework might be more than a way to earn college credit while still in high school; it may serve as a bridge to postsecondary education for first-generation college students.

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APPENDICES

APPENDIX A
IRB APPROVAL FORM

APPENDIX A

March 11, 2010

MEMORANDUM

TO: Todd Loftin
John Murry

FROM: Ro Windwalker
IRB Coordinator

RE: New Protocol Approval

IRB Protocol #: 10-02-488

Protocol Title: *Dual and Concurrent Credit: The Bridge to Post-Secondary Education for First Generation College Students*

Review Type: EXEMPT EXPEDITED FULL IRB

Approved Project Period: Start Date: 03/11/2010 Expiration Date: 03/10/2011

Your protocol has been approved by the IRB. Protocols are approved for a maximum period of one year. If you wish to continue the project past the approved project period (see above), you must submit a request, using the form *Continuing Review for IRB Approved Projects*, prior to the expiration date. This form is available from the IRB Coordinator or on the Compliance website (<http://www.uark.edu/admin/rsspinfo/compliance/index.html>). As a courtesy, you will be sent a reminder two months in advance of that date. However, failure to receive a reminder does not negate your obligation to make the request in sufficient time for review and approval. Federal regulations prohibit retroactive approval of continuation. Failure to receive approval to continue the project prior to the expiration date will result in Termination of the protocol approval. The IRB Coordinator can give you guidance on submission times.

If you wish to make *any* modifications in the approved protocol, you must seek approval *prior to* implementing those changes. All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change.

If you have questions or need any assistance from the IRB, please contact me at 120 Ozark Hall, 575-2208, or irb@uark.edu.

APPENDIX B

t test and Chi-square test on gender, ethnicity, age, and ACT

APPENDIX B

Table B1

Gender Comparison FTFGCS With and Without Dual/Concurrent Credit

Gender	FTFGCS without dual/concurrent (n=7,910)	FTFGCS with dual/concurrent (n=58)
Male	45.95%	41.38%
Female	54.04%	58.62%

Note. Independence test by gender: $\chi^2 (1) = 0.49$ $p = .482$

Table B2

Ethnic Comparison FTFGCS With and Without Dual/Concurrent Credit

Ethnicity	FTFGCS without dual/concurrent (n=7,910)	FTFGCS with dual/concurrent (n=58)	Test Pearson Chi- Square	Pr
Caucasian	87.45%	89.66%	.26	.61
African American	4.01%	0%	2.42	.12
Hispanic	2.50%	1.72%	.14	.71
Native Hawaiian - Pacific Islander	0.06%	0%	.04	.85
American Indian / Alaskan Native	2.17%	0%	1.29	.26
Asian	2.36%	3.45%	.29	.59
Foreign	.24%	0%	.14	.71
Did not wish to respond	0.66%	1.72%	.99	.32
Unknown ethnicity	.30%	3.45%	17.51	.00
Two or more	.24%	0%	.14	.71

Table B3

Age Mean and Standard Deviation FTFGCS With and Without Dual/Concurrent Credit

Variable	N	M	SD
FTFGCS with dual/concurrent	7,910	18.43	.79
FTFGCS without dual/concurrent	58	18.33	.57

Note. Independence test by age: $t = .96$ $p = .34$

Table B4

Means, and Standard Deviations of FTFGCS With and Without Dual/Concurrent Credit

ACT	FTFGCS without dual/concurrent	FTFGCS with dual/concurrent
N	7,910	58
M	25.19	28.12
SD	3.99	3.72

Note. Independence test by ACT: $t = -5.58$ $p = 0.00$

