Abstract

MCLEAN, CARRIE FREDERICK. An Examination of the Impact of Major Changing Patterns on the Academic Performance and Career Decision-making Self-efficacy of First Generation College Students. (Under the direction of Dr. Raymond Ting).

Career development studies show that First Generation College Students (FCGS) have unique career development needs, less college knowledge, and the increased likelihood that they will not complete college. There is evidence in the research that changing majors could impact a student's ability to complete college successfully, especially if they change majors late in their college experience. FGCS may be differently impacted by changing majors than their non-first generation peers because they have unique career development needs that negatively impact their career paths and decisions. The goal of this research was to gain a better understanding of how changing majors might impact the career decision-making self-efficacy of FGCS (particularly those who are *redeciding*). The Career Decision-Making Self Efficacy Scale – Short Form was used to compare the career decision- making self-efficacy of first generation college students who changed their majors to first generation college students who did not change their major.

Results of a one-way ANOVA comparing the mean CDSE-SF scores of FGSC who did not change their major to those who did change their major at least one time did not render any statistically significant differences. A meaningful difference was found ($F(1, 227) = 1.092$, $p>.05$) between the means of the two groups was found for the self-appraisal item, "Decide what you value most in an occupation." Additionally, when comparing FGCS with 90 or more credit hours, a statistically significant difference in CDSE-SF item "*Prepare a good resume*" was found between those who changed majors at least once and those who did not change majors at all. The mean score for FGCS was significantly lower (M = 3.83, SD =

1.039) than the mean score of A comparison of the grade point averages of first generation college students who did not change their majors and those who did change their major resulted in a statistically significant difference t (221) = 2.233, $p < .05$) between the mean GPA of the two groups.

A comparison of the academic performance (as measured by grade point averages) of first generation college students who did not change their majors and those who did change their major resulted in a statistically significant difference t (221) = 2.233, $p < .05$) between the mean GPA of the two groups. This analysis revealed that the first-generation college students who did not change their major had a significantly higher GPA (*M* = 3.25, *SD* = .449) than the first-generation college students who did change their major at least one time (*M* = 3.10, *SD* = .536). This analysis revealed that the first-generation college students who did not change their major had a significantly higher GPA (*M* = 3.25, *SD* = .449) than the first-generation college students who did change their major at least one time (*M* = 3.10, *SD* = .536).

This finding suggests that the career decision-making self-efficacy of first generation college students might not be impacted by changing majors. Further research that addresses the career decision-making needs of specific groups of FGCS, particularly low-income students, is recommended.

An Examination of the Impact of Major Changing Patterns on the Academic Performance and Career Decision-making Self-efficacy of First Generation College Students

by
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Dedication

This dissertation is dedicated to my oldest son, Christian McLean, my greatest supporter who has been my strongest inspiration to complete this degree.

This dissertation is dedicated to my mentor, Dr. John Ambrose, who taught me about the hidden rules of higher education and challenged me to complete this course of study.

This dissertation is dedicated to my father, James Marvin Frederick, who was a natural born scholar with an eighth grade education. He was truly the smartest man that I have ever known.

Biography

Carrie Frederick McLean currently serves as the Assistant Dean of University College and Executive Director of Advising at North Carolina State University where she has worked for more than thirty years. She holds a Bachelors of Arts in Communications from North Carolina State University, a Masters of Library and Information Science from North Carolina Central University; a Masters of Higher Education Administration from North Carolina State University; and is currently completing requirements for a Doctor of Philosophy degree in Counseling and Counselor Education at North Carolina State University.

Her professional experience in higher education includes teaching, advising, supervision, administration, staff development, organizational development, information management, workflow planning, and diversity education. Her research interests are in student development, organizational development, career counseling, and deciding students. She has served NC State University in many capacities. Her service includes Scholarships and Student Aid Committee Chair, Council on Undergraduate Education Chair, Global Proficiency Advisory Committee, University Diversity Advisory Committee, University Diversity Coordinator (First Year College and NCSU Libraries), Advisory Council for Enhancing Student Success, International Operations Council, International Student Success Committee Chair, First Year Student Success Taskforce, Admissions Committee, Initiative to Maximize Student Diversity Grant Collaborator, Division of Academic and Student Affairs Curriculum Committee, Study Circles on Race and Ethnicity Dialogue Facilitator, Staff Development Specialist, and University Academic Advising Council Chair. McLean is a certified diversity trainer by the National Coalition Building Institute and committed member of the National Academic Advising Association, National Resource Center for the First Year Experience and Students in Transition, Chi Sigma Iota Honor Society, Phi Delta Kappa Honor Society, and the North Carolina Career Development Association.

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"The way to develop the best that is in a person is by appreciation and encouragement."

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Chapter 1

Introduction

First Generation College Students (FGCS) are students whose parent did not attend college (Choy, 2001). These students are among the fastest growing groups of students in higher education today. Some 27% of all college-bound high school graduates in the United States are first generation college students (Choy, 2001). While FGCS have seen some gains in college access over the past 20 years they have seen little change in college graduation rates and continue to lag behind their non-first generation peers in both graduation and retention. Chen (2005) reports that 43% of the FGCS who entered college between 1992 and 2000 had not earned a degree eight years later. Some 20% of their non-FGCS peers had graduated within the same eight-year timespan.

There is a plethora of research that describes the first generation college student and identifies some of the challenges that they encounter in college. Engle (2007) studied the differences between low-income FGCS and their non-first generation peers. She reports that FGCS are more likely to have limited knowledge about navigating the college landscape, referred to as *college knowledge*; delays in college entry after high school; less academic preparation when beginning college; the need for remedial coursework; limited knowledge about careers; a focus on technical and vocational fields; and a tendency to apply to and attend less selective colleges. Chen (2005) found that throughout their college experience FGCS have lower grade point averages (GPAs) and tend to withdraw from and repeat more classes than their non-first generation peers. FGCS students tended to withdraw at a rate of 12% compared to a 7% withdrawal rate for their peers who are not first generation. The lack of success of FGCS in high school and college is well-documented in the research literature; however, Chen (2005) reports that even when academic preparation and other demographic factors are similar, first generation students still tend to underperform compared to their non-first generation peers. Much less of the research effort focuses on identifying what happens to FGCS while they are enrolled in college and the factors that limit their ability to be successful.

Increasing the graduation and persistence rates for FGCS has proven to be a challenge for these students all across the United States (Chen, 2005; Engle, 2007). According to Engle and Tinto (2008) only 25% of first generation college students and 11% of low income first generation college students will earn a degree within six years compared to 55% of their non- first generation peers. Ishitani (2003) found that most FGCS are African American, Hispanic, and come from low-income families. The fastest growing populations in the United States have historically had difficulty gaining access to education, and when they do gain access, they graduate at a lower rate than other students (National Center for Education Statistics [NCES], 2012). In 2012, Hispanics and African Americans together comprise about 22% of the general population, but they account for only 19% of college enrollment and 14% of all degrees earned (US Dept. of Education, 2013). Moreover, among college students, Hispanics and African Americans are more likely to be overrepresented in lower income brackets, which is another factor associated with lower college attendance and lower graduation. Only 50.9% of low income high school students attend two- or four-year colleges, compared to 80% of their higher income peers (NCES, 2012). One of every 10 people from low-income families earn a bachelor’s degree by age 25, while five times as many people from high income families do so (Bailey & Dynarski, 2011).

Some research suggests that low income students are less likely to attend college because they are more likely to be underprepared (Adelman, 1999). The perception of preparedness may differ among the individual student, college admissions officers, and parents between high income and low income students. However, other studies reveal that high income students are more likely to attend college and graduate faster than their low income peers even when their academic preparation is similar. For instance, only 29% of the highest achieving quartile of low income students earns a bachelor's degree, compared to 74% of their high income peers in the highest achieving quartile (Digest of Educational Statistics, 2013). According to Bowen, Chingos, and McPherson (2011) about a quarter of the variance between low- and high-income students at public universities can be explained by such characteristics as high school grades, college entrance exam scores, race, ethnicity, and gender. The rest of the variance is attributable to other non-cognitive or *non-academic* factors (Sommerfield, 2011). There is a recent focus in the research on understanding and identifying the impact of these non-cognitive and institutional factors on graduation and retention rates (Robbins, Allen, Casillas, Peterson, & Le, 2006; Ting, 2003).

One of the cognitive variables that has been well-addressed in the research literature is self-efficacy in FGCS. A student's level of self-efficacy has been proven to be related to academic success (Evans, Forney, & Guido-DiBrito, 1998). Self-efficacy refers to the beliefs an individual has about his or her ability to successfully complete a given task or activity. Results of research conducted by Multon, Brown, and Lent (1991) showed that poor grades, lack of persistence, and psychological dysfunction were related to low levels of self-efficacy.

More specifically, a lack of career decision-making self-efficacy is directly related to career decision-making difficulty. The same contextual variables that impact career decision-making impact a student's decision to remain enrolled in college (Paulsen & St. John, 2002). College students who have low career decision-making self-efficacy are less likely to participate in career exploration activities and more likely to make poor career decisions, such as making an uninformed or ill-informed decision about a major (Taylor & Betz, 2001). Hence, increasing a low-income student's self-efficacy regarding a career choice is critical to a student's chance of being successful academically, making better career choices, and being successful in their careers after college. Career decision-making self-efficacy has been proven to be critical to persistence in college and degree attainment (Taylor & Betz, 2001). It is of utmost importance to identify factors that impact and enhance the career decision-making self-efficacy of low-income college students to increase the likelihood of retention and graduation.

Statement of the Problem

Selecting a college major is undoubtedly one of the most important career decisions that a college student has to make (Gordon, 2007). Career decision-making self-efficacy impacts a student's level of confidence in their ability to successfully complete a college major and secure a job in a chosen field. According to Taylor and Popma (1990) students who have high levels of self-efficacy also report higher levels of confidence in their career decisions. Additionally, a student's level of career decision-making self-efficacy is associated with higher levels of career and vocational decidedness (Taylor & Popma, 1990). Taylor (1990) found that career decision- making self-efficacy was the only predictor of vocational indecision in a diverse range of *undecided* college students. These studies are evidence of the impact that selecting or changing a college major can have on the career decision-making self-efficacy of students.

There is a limited amount of research that focuses, specifically, on how changing one's major might uniquely impact the career decision-making self-efficacy and academic success of FGCS during college and their career success after college. This study will provide additional depth to the knowledge base related to one particular career development task of FGCS, specifically, changes in academic major. This study will also examine the impact that changing majors can have on the career decision-making self-efficacy of FGCS who are "*redeciding*" during the early years of college. Redeciding students are those students who enter college decided on a major but later decide to change that major. The ultimate goal of this research is to gain insights that will inform the development of career exploration programs, activities, and infrastructure which increase the likelihood that redeciding FGCS will persist to graduation and reduce time to degree.

Recently, there has been a growing concern within the academic environment and across the nation about both the lack of academic preparedness and the career success of FGCS (Gibbons & Shoffner, 2004; Grier-Reed & Ganuza, 2012). There has been significant research on the impact of career decision-making self-efficacy on students' ability to achieve academic and career goals. However, research that focuses, specifically, on how the career decision-making self-efficacy of FGCS might be differently impacted than that of other students is quite limited. FGCS have unique career decision-making challenges that can make them even more at risk of career indecision than their non-first generation peers

(Wiljanen, 2003). They face many barriers that may limit the experiences and information needed to make sound career decisions such as limited access to role models, financial stress associated with college cost, and a tendency to have parents with limited knowledge about how best to support them while they are enrolled in college (Choy, 2001; Horn, Nunez, & Bobbit, 2000). Additionally, FGCS are challenged by limited information about the importance of education and college to be successful, family pressure to enter the workforce after high school, and under-preparedness for college coursework (Engle & O'Brien, 2007; NCES, 2000; Sickles, 2004). These barriers are significant and can shape the career development, career decision-making, and have implications on both the academic and career goal attainment of low-income students and first generation college students (Gore, 2005).

It logically follows, then, that the career decision-making self-efficacy of FGCS could be adversely impacted. This may be attributed to their perceptions that they are from oppressed populations who are more likely than other non-FGCS to have negative experiences and biases towards an inability to be successful in careers. Lent, Brown, and Hackett (2000) found that individuals who feel and are oppressed tend to unnecessarily limit their career options when making career decisions such as choosing an academic college or major. It has been reported that FGCS students are more likely to have low self-esteem (Choy & Bobbit, 2000). A study conducted by Nota and Soresi (2003) showed that low self-esteem is associated with low levels of career decision-making self-efficacy. Bullock-Yowell, Andrews, and Buzzetta (2011) highlight the impact of negative self-talk and negative career thoughts on career decision-making self-efficacy among FGCS. According to Smith, Pender, and Howell (2013) about 8% of high achieving, low socioeconomic status students apply to institutions that are not an appropriate match for their abilities. This tendency impedes the students' ability to achieve optimal academic career success.

Rationale

Career decision-making self-efficacy has been correlated with academic success in college as well as career success following college (Evans, Forney, Guido, Patton, & Renn, 2010). Results of research conducted by Multon, Brown, and Lent (1991) showed that poor grades, lack of persistence, and psychological dysfunction were related to low levels of self-efficacy. More specifically, a lack of career decision-making self-efficacy is directly related to career decision-making difficulty. Students who have low career decision-making self-efficacy early in their college careers are less likely to participate in career exploration activities and more likely to make poor career decisions (Evans et al., 2010). Identifying an academic major is among the most important career decisions that a student makes in their college career. Hence, increasing a first generation student's career decision-making self-efficacy is critical to improving that student's chance of being successful academically, making better career choices, and being successful in their careers after college. A student's confidence and belief in their ability to make a well-informed decision about a college major is critical to a student's ability to complete college (Taylor & Betz, 1983). Student's behavior regarding changing majors can significantly impact their ability to graduate on time and reduce the cost of the college experience (Micceri, 2002; Staley, 2014). The specific goal of this study is to understand how the career decision-making behavior of low-income students might differ from that of other college students.

Purpose

The purpose of this study is to examine patterns of major changing in FGCS who attend NC State University in an attempt to understand how changing majors might impact these students' career decision-making self-efficacy and their ability to persist in college and graduate in a timely manner.

Significance of the Study

Much of the research literature about college students who change majors is focused on determining why students leave college early and identifying the characteristics of the students who leave and/or stay. However, much less of the literature is focused on what happens to students while they are enrolled in college and the quality of their college experience, the length of time to graduation, and the amount of money spent obtaining a college degree. It is clear that the comprehensive college experience, the success indicators, and expected outcomes of college are much different for FGCS, who are mainly from low-income families, than for their higher-income peers (Daire, LaMothe, & Fuller, 2007). First generation college students are much more likely than their non-first generation peers to be from low income families. Some 42% of first generation college students enrolled in two- and four-year colleges came from families who earned less than $25,000 per year (Choy, 2001). This compares to 18% of their non-first generation peers. Low- income and first generation students have historically faced barriers and challenges in higher education over the past 30 years (Engle & Tinto, 2008).

There is a growing body of research and literature that explores the barriers that are faced by FGCS and show that these barriers are negatively impacting students' progress toward degree and their career success (Education Advisory Board [EAB], 2014; Kelly & Hatcher, 2013). However, there is much less research exploring how the career decision-making self-efficacy of FGCS might be particularly affected because of these barriers. The lack of career networks, information, mentors, and resources are among the many barriers faced by FGCS (Kelly & Hatcher, 2013). Understanding how these barriers uniquely impact their decision-making about an academic major, their ability to complete a college degree, and their confidence in future career decision-making after college will move higher education administrators one step closer to bridging the gap in graduation rates, retention rates, and academic success between FGCS and their peers who are not first generation.

Research Questions

The following research questions guided this study:

1. What are the differences in the levels of career decision-making self-efficacy scores between first generation college students FGCS and other college students?
2. What are the differences in the GPA of FGCS who changed their majors at least one time compared to those students who did not change majors?
3. What are the differences in the levels of career decision-making self-efficacy scores between first-generation college students who changed their majors at least one time and FGCS who did not change their major?

Definition of Terms

The following list of definitions is provided to clarify meaning and to alleviate possible misunderstanding of terminology because these terms are defined differently, used synonymously, or have multiple uses throughout the research literature. The term redeciding is defined as a new categorization of undecided student created by the author. *Phantom major* is defined as it is used informally by many practitioners but there is no evidence of the definition of the term in the formal research literature.

Academic performance. The achievement of a satisfactory grade point average and progression toward an academic degree in college. For the purpose of this paper academic performance is measured by accomplishing a grade point average that is above a 2.0 on a 4.0 grading scale.

Academic success. The continuous enrollment and completion of a bachelor's degree program.

Career decision-making self-efficacy. An individual's confidence and belief in his or her capability to make a career decision (Hackett & Betz, 1981).

Career decision self-efficacy scale --short form (CDSE--SF). An instrument developed to measure one's belief that he/she can successfully complete necessary actions to make sound career decisions (Betz, Klein, & Taylor, 1996).

First generation college student. A student whose parents did not complete an undergraduate college degree.

Low-income student. A student who has limited access to economic and social resources. For this study low-income students are students whose family income is below 150% of the federally established poverty level for their family size (Choy & Bobbit, 2000).

Major change. A change from one declared major to another major as indicated by college curriculum codes. A change from undeclared admission status to a declared status does not count as a *major change* for the purpose of this study.

Non-traditional student. A student who delays enrollment and does not enter college immediately following their completion of high school. Generally, the student is more than 24 years old and works at least part-time. (Choy, 2002).

Persistence. The continuous enrollment in college without taking time off until a degree has been completed.

Redeciding. The act of changing from one designated academic curriculum in college to a different academic curriculum. Curricula are indicated by college curriculum codes. (McLean, 2013 unpublished).

Retention. The continuation of one's college experience usually measured from one academic year to the next year

Self-efficacy. An individual's confidence and belief in his or her capacity to achieve a specified outcome or result (Bandura, 1977)

Undecided student. A student who is not able to or not willing to commit to an academic major upon entering college (Gordon, 1984)

Limitations of the Study

1. The sample for this study was collected from students enrolled at NC State University during the spring 2015 semester and may not be generalizable across different kinds and sizes of institutions.
2. The sample used was a convenience sample and may not be generalizable across other populations or the larger student population at NC State.

Summary

This study is grounded in a Social Cognitive Career Theory framework and is designed to distinguish the unique characteristics of redeciding *exploratory* FGCS from those of undecided exploratory students, describe how redeciding (or changing majors) impacts FGCS differently than it impacts those students in the control group (non-FGCS), assess the level of perceived career decision-making self-efficacy of FGCS with 30-90 credit hours, and assess the major changing behavior of FGCS to determine if differences exist in the impact of major changing behavior on FGCS success and the success of other non-FGCS.

Chapter 2

Review of the Literature

A review of the literature was conducted to examine the academic success of FGCS, their career decision-making self-efficacy, and their major changing behavior. The salient groups of literature that contributed to the investigation of the constructs and the insights gained during the examination are presented in this chapter. The literature review is given context by providing some background information on the state of degree completion in the United States and should provide the reader with broader context for current issues and trends that impact the study. The rest of the chapter is divided into five sections which include: (a) the state of degree completion for FGCS; (b), Social Cognitive Career Theory; (c) characteristics of exploratory students (undecided, decided, redeciding); (d) career decision-making self-efficacy; and (e) major choice and major changing behavior in college students.

Degree Completion for FGCS Students

Increasing the educational attainment of United States citizens will not only require that more students graduate but it will be critical to graduate a broader range of different students who have historically been underrepresented in both high school and college graduation rates. Census data show that the Hispanic population will nearly double moving from 16% in 2012 to a projected 30% by 2060 (United States Census Bureau, 2012); the Asian population is projected to increase from14.4 million to 34.4 million; and the African American population is projected to increase from 39.9 million to 56.9 million. During the same time frame the non-Hispanic white population is projected to decrease from 64.7% to

46.3% by 2060. Racial and ethnic minorities are the fastest-growing populations in the country but are disproportionately represented among the lowest income brackets (United States Census Bureau, 2014). Hispanics and African Americans comprise approximately 22% of the general population, but only 19% of the college enrollment and 14% of the degrees earned in the United States (US Dept. of Education, 2013). The United States college graduation rates reflect that the fastest growing segments of society have difficulty gaining access to education (Engle, 2007; Engle & Tinto, 2008). When they do gain access there is disparity in graduation rates (Engle, 2007; Engle & Tinto, 2008).

Nontraditional students. The research literature discusses changes in the college going population and the increased presence of *nontraditional* students (Lipka, 2012). According to a report by the NCES (2012), 73% of all students are nontraditional students and 39% of students are over the age of 25. While these students are committed to getting a college education they have to balance this goal with working a job to support themselves, competing family transitions, transferring across colleges, and the need to take courses during nontraditional hours (Forbus, Newbold, & Mehta, 2011). College-going practices are also impacted by job layoffs that cause many older students to return to college to complete degrees or gain further training, veterans returning to school after completing their service to the military, changing workforce demands, and the retrenched economic condition of the country (McGraw & Burr, 2011).

Low-income students. It is important to understand the completion rates of low income students and students of color because 50% of FGCS are low income and students of color tend to be over-represented in the first generation groups of students. First generation students who are low income face even more challenges than other first generation students and are even less likely to graduate than other first generation students (Engle & Tinto, 2008). Low-income students demographically tend to be first generation, racial and ethnic minorities, single parents, and have English as a second language (Engle & Tinto, 2008). Therefore, increasing the college degree attainment for first generation low income students, particularly, is critical to the economic well-being of the country. Only 50.9% of low-income high school students attend two- or four-year colleges after high school compared to 80% of their higher-income peers (NCES, 2012). One of every 10 people from low-income families earn a bachelor's degree by age 25 compared to five out of 10 people from high-income families (Bailey & Dynarski, 2011). Generally, while the nation's college going rates are increasing, this increase is due to the increase in the rates of middle and high income students. The college going rate for low income students has seen much slower growth (NCES, 2012).

Many research studies show low-income students are less likely to attend college because they are more likely to be underprepared to do so (Adelman, 2006). However, other studies reveal that only 29% of the highest-achieving quartile of low-income students earns a bachelor's degree compared to 74% of their peers who are in the highest-achieving quartile of the high- income students (Snyder & Dillow, 2015). The 29% college attainment success rate for high achieving low-income students is still less than the 30% college attainment success rate of the lowest achieving higher income students. According to Bowen et al. (2011) about one-fourth of the variance between low-income and high-income students at public universities can be explained by such student characteristics as high school grades, college entrance exam scores, race, ethnicity, and gender. The rest of the variance is attributable to other factors some of which remain unidentified.

Low-income first generation college students are four times more likely than other students to leave college after their first year, and 89% of these students still have not graduated in six years (Paul, 2012). According to a report conducted by the NCES (2012), 50% of college students are first generation. When the numbers are disaggregated the report shows that students of color comprise the greatest percentage of first generation students: 48.5% of Hispanic or Latino students report that they are first generation; 45% of African Americans; 32% of Asians; 35% of Native Americans; and 28% of Caucasians (NCES, 2012). Identifying factors that impact first generation students' ability to complete college is critical to improving graduation rates.

Chen and Carroll (2005) defined first generation college students as those students whose parent(s) never completed a college degree. Much of the research on first generation college students has focused on the characteristics of first generation college students (Murphy & Hicks, 2006; Tym, McMillion, Barone, & Webster, 2004); barriers and challenges that they face in higher education that differentiates their experience from that of other students (Tym, McMillion, Barone, & Webster, 2004); limited academic success in high school compared to their peers who are not first generation (Martinez et al., 2009); limited preparation for college (Pascarella, Pierson, Wolniak, & Terenzini, 2004); recruiting first generation college students (Vargas, 2004); and increasing the college completion rate of FGCS (Choy, 2001). While FGCS have experienced improvement in college access since 1964, they continue to lag behind their non-first generation peers in college completion

(Choy, 2001;   Nunez & Cuccaro-Alamin, 1998). This is especially true for low-income first generation students (Murphy & Hicks, 2006; Thayer, 2000). This disparity between the completion rate of FGCS and their non-first generation peers is especially concerning given that both groups of students enter college with high aspirations and the intention of completion. The results of the annual Freshman Survey, a report produced by the Cooperative Institutional Research Program, shows that FGCS's aspirations for advanced degrees have increased from 41.9% in 1974 to 75% in 2014 (Egan, Stolzenberg, Ramirez, Aragon, Suchard, & Hurtado (2014). This reflects only a 3% difference in aspirations when compared to their non-first generation peers.

The research literature reflects some of the reasons for the lack of success of low income FGCS students in college to be the lack of knowledge about college (Brost & Payne, 2011); the increased likelihood to work during college (Murphy & Hicks, 2006; Pascarella et al., 2004) financial stress (Martinez et al., 2009); parental and family stressors (Wang & Castaneda-Sound, 2008); academic underperformance (Pascarella et al., 2004); challenges with work-life-school balance (Coffman, 2011; Owens, Lacey, Rawls, & Holbert-Quince, 2010). These aforementioned challenges are among others faced by low-income FGCS. While some challenges are cognitive, the research establishes that even when cognitive factors are accounted for, low-income students still do not achieve the same success as their higher income peers (Murphy & Hicks, 2006; Ting, 2003). Hence, researchers continue to explore ways to increase the retention and graduation rates of FGCS, especially low-income FGCS.

Challenges to institutional infrastructure. First generation low-income students have challenged the traditional higher education infrastructure in many ways. Administrators and policy makers struggle to find ways to increase the academic success of first generation low–income students and close the graduation gap between first generation low-income students and their higher-income peers. However, the barriers that today's students face make it difficult to measure graduation rates. Measuring graduation rates is a fairly new phenomenon in higher education. The Education Department established regulations for measuring graduation rates in mid-1990s and defined the graduation rate as the "percentage of first-time, full-time students who enrolled in the fall and completed their degree within 150% of normal time" which meant six years for students seeking a bachelor's degree (Selingo, 2012). While this definition and metric of the graduation rate was useful for earlier times in higher education, there has been significant change in both student populations and society that has rendered the current definition obsolete for many students (Selingo, 2012). Nontraditional students are increasing in higher education and have become the impetus for many changes in the higher education arena (Choy, 2002). All of these changes taken together are the driving force to redefine the term graduation rate. By any proposed definition of the term there will still remain a disparity between first generation students, especially those who are low income, and other students (DeSilver, 2014).

Social Cognitive Career Theory

Social Cognitive Career Theory (SCCT) provides a sound theoretical foundation for investigating career decision- making behavior in college students. It addresses personal intentions, personal qualities and characteristics, and personal goal setting which are all requisite tasks that must be accomplished in sound career decision-making (Lent et al., 1994). The theory has particular utility for understanding the interrelationships between career barriers, career goals, career decision- making self-efficacy, and academic self-efficacy. SCCT takes into account environmental factors, person inputs, and contextual variables that impact one's learning experiences (Lent et al., 1994). These learning experiences will ultimately impact one's willingness to make career decisions and the confidence that one has in their decision-making ability (Lent, et al., 1994).

SCCT evolved from Bandura's (1986) general Social Cognitive Learning Theory. The major premise is based on the relationships that exist between the personal, cognitive, and environmental factors that determine learning. Bandura theorized that self-efficacy is developed by four types of learning experiences: a person's earlier personal performance outcomes and achievements; vicarious learning; social persuasion; and emotional and physiological condition (Bandura, 1986). These four attributes can also provide a foundation for self-efficacy enhancing interventions (Lent et al., 2000). SCCT initially focused on cognitive variables as they relate to learning. Lent et al. (1994) extended SCCT to the field of career development and included personal perceptions and environmental variables as well.

SCCT focuses on both cognitive variables and person variables (self-efficacy, outcomes, and goals) that interact with the person and the person's environment. SCCT considers both contextual barriers as well as contextual supports as environmental variables that can impact the development of career choice (Lent et al., 1994). Career choice can also be impacted by both concrete and perceived environmental effects (Lent et al., 2000). Lent et al. (1994) explored the relationship between career and academic interest development, career choice development, and the process by which these choices develop into career action. They theorized that individuals use personal agency (intention and self-direction) to make career decisions. They further contend that personal agency and intentions are impacted by the interaction between social cognitive factors of self-efficacy, outcomes expectation, and personal goals. Together these factors function to influence an individual's career interests, career decision-making and career development (Lent et al., 1994).

Key theoretical tenets. Three key constructs of the theory are self-efficacy, outcome expectations, and goals. A major premise of the theory is that an individual will develop strong and long-lasting interests in career activities in which they feel confident they can achieve success (positive outcomes) (Lent et al., 1994). When people do not feel competent and capable of achieving positive outcomes, they will avoid participating in the activities. According to Lent et al. (1994) individuals may perceive barriers even when they have experienced success in a particular area or, conversely, they may not perceive barriers when contextual or environmental barriers exist. This is particularly true for FGCS who come from historically underrepresented and socially oppressed groups (Hicks, 2012). FGCS students are often unaware of the impact that institutionalized oppression and stereotyping can have on their self-esteem and self-efficacy. Personal characteristics, background, and environment contribute to the development of career decision-making self-efficacy and outcome expectation by influencing the learning experiences (personal performance accomplishments, vicarious learning, verbal persuasion, and emotional and physiological conditions) (Lent et al., 1994). Self-efficacy beliefs and outcome expectations impact the development of career interests, career thoughts, and the career behaviors that then influence career choice, career goals, and career performance. Career barriers and career supports defined as contextual factors by the theorists also influence career choice goals and actions.

Lent et al. (1994) discovered that personal performance achievement would impact outcome expectations and self-efficacy more than would vicarious learning, verbal persuasion, and physiological states. The authors further posit that the correlation between goals and interests and the correlation between goals and actions is higher when perceived barriers are low and perceived support and opportunity are high. This premise offers broad utility and accommodates the circumstances of groups and individuals who have been historically marginalized and/or oppressed. These insights help explain why students who are highly capable by every cognitive measure might not be successful academically or have low confidence in their ability to succeed at accomplishing career goals.

Self-efficacy. Self-efficacy refers to the beliefs an individual has about his or her ability to successfully complete a given task or activity. Individuals develop their sense of self-efficacy from social interactions, personal performance, learning by example, and their perceptions of a given situation or activity. Most researchers argue that self-efficacy is applicable to diverse groups because it addresses both personal background and environmental factors. However, some theorists argue that self-efficacy is not applicable across cultural groups. Pajares (1996), for instance, cautions researchers that they should be specific and identify the context of self-efficacy when they conduct research.

Outcome Expectations. Outcome expectations are the beliefs that one expects as a consequence of participating in a given task or performing a certain behavior. Outcome expectations are thought to develop from past performance of a given action, observation of the outcomes produced by others, reaction of others to outcomes, attraction to personally generated outcomes, and emotions associated with task performance. Career goals and intentions are directly impacted by outcome expectations (Ochs & Roessler, 2004). The more success that an individual has accomplished or experienced in past, the more likely that person is to believe that they will continue to be successful in future endeavors. It logically follows that when individuals have a long history and experience with limited or no success, they are less likely to have the confidence that they will find future success.

Goals. Goals are defined as the decisions developed to begin a particular activity or achieve a future plan. Goals are critical to success and behaviors result from and are sustained by previously set goals (Lent et al., 1994). There is a direct relationship between goal achievement and increases in self-efficacy. As self-efficacy increases, the likelihood that a positive outcome will result from similar performance in the future increases. Positive and negative experiences with goal achievement can create repetitive cycles of success or failure respectively. Individuals with specific goals tend to achieve more, establish more challenging future goals, and evaluate expected outcomes more effectively. Moreover, individuals with high self-efficacy tend to set high and more specific goals while those with low self-efficacy set lower and more broad-based goals (Lent et al., 1994). Lent et al. (1994) contend that goals and intentions can positively impact behavior even when there is a lack of environmental improvement. This might explain why some individuals from unfavorable circumstances can still accomplish desirable outcomes. If individuals have high career decision-making self-efficacy and well-defined goals, they are more likely to have the perception that they can be successful and more likely to succeed despite their background circumstances.

Applicability. The research literature well-reflects the applicability of SCCT across a diverse range of groups: Iranian college students (Rajabi, Papzan, & Zahedi, 2012); African American college students (Dickinson, 2007); athletes (Demulier, Scanff, &Yannick, 2013); school-to-work transition (Kelly, 2009); unemployed adults (Dahling, Melloy, & Thompson, 2013); women's career choice (Hackett & Kohlhart, 2012); and lesbian, gay, and bisexual students (Arnett, 2013). Some critics question the applicability of SCCT across groups who are not college educated because so much of the related research has been conducted on college students (Lindley, 2005; Nauta, 2004). Critics have also articulated concern because most of the empirical research that has been conducted on SCCT is focused on its applicability to students in specific disciplines such as Science, Technology, Engineering, and Math (STEM) and professional fields. Only recently have scholars begun to explore applicability of SCCT in other disciplines such as school to work transition (Kelly, 2009); women teachers (Montgomery, 2009); women athletes (Smith, 2010); school counselors (Tang, 2003); and middle school students (Gibbons & Borders, 2010).

There is also a plethora of other research related to the applicability of SCCT to college students. Tang, Fouad, and Smith (1999) used SCCT as a foundation to study factors that predict career choices of 187 Asian American college students. The factors studied included level of acculturation, family socioeconomic status, family involvement, occupational interests, and career self-efficacy. The results of the study showed that predictors of career decision-making determine which factors contributed to career choice.

They found that Asian American students are most influenced by family background, self-efficacy, and acculturation when choosing occupations.

SCCT has also been applied to Chinese students and shown applicable across that cultural group as well. Jin, Watkins, and Yuen (2009) studied the stability of the relationship between career decidedness and personality characteristics in Chinese students. Using survey research with a sample of 2,046 students, the researchers found that career decision-making self-efficacy correlated with personality characteristics, conscientiousness, and agreeableness. Rogers, Creed, and Glendon (2008) also studied how personality characteristics, self-efficacy beliefs, social supports, outcome expectations, and intentions impact career planning, career exploration, and career readiness in college students. Studying a group of 414 high school students, they found that career planning is associated positively with self-efficacy and career exploration is associated with goals and social supports.

Summary. SCCT is a comprehensive theory that focuses on how career barriers (both personal and contextual) impact career self-efficacy, goals, and interests. The research literature focuses more on the person-level characteristics than on perceptual barriers. Recently researchers have begun to focus more attention on the objective, systemic, societal and institutional contextual career barriers that influence people. A major contextual factor that impacts an individual's ability to develop career decision self-efficacy are perceived barriers (Luzzo & McWhirter, 2001). Perceived barriers have been shown to be relevant to individuals' career development and self-efficacy, especially for women and people of color (Luzzo & McWhirter, 2001). Individual perceptions have surfaced as a contextual barrier that can negatively impact the career development of people of color and women, in particular (Luzzo & McWhirter, 2001). Women's perceptions of their ability to be successful in science and technology degrees have been shown to have significant impact on both outcome expectations and performance expectations (Walsh & Savikas, 2005).

Characteristics of Exploratory Students

Undecided exploratory students. There is no doubt that the state of being undecided impacts a student's ability to be successful in college and renders the undecided student an *at-risk* population (Gordon, 2007; McLean & Hauschild, 2007). Undecided students make up a much larger proportion of the total student population than anyone realizes because they are often undecided but have declared a major. The actual number of students who are undecided when they enter college is unknown and very difficult to assess because many students select majors upon admission to college due to parental pressure, popular culture, high predicted salary potential, and peer pressure (Montag, Campo, Weissman, Walmsley, & Snell, 2012). Students' initial major choices are rarely ever well-informed and seldom reflect sound career decision-making strategies. More often than not, major choices are made prematurely with little exploration or thought given to the selected major (Gordon, 2007).

Gordon (2007) and Steele (1994) estimated that from 50-75% of all students enter college undecided. McDaniels, Carter, Heinzen, Candrl, and Wieberg (1994) also estimated that as many as 77% of all freshman and sophomores are undecided. Researchers have employed a diverse range of strategies trying to predict the number of undecided students. For example, Lin, Lin, and Hwang (2012) used engineering methodology, mathematical modeling called Materials Resource Planning (MRP), and a college entry examination score in an attempt to forecast the number of college support professionals needed to serve undecided high school students. Their goal was to predict human and financial resources needed by colleges by predicting major choice and placement of entering college freshmen students in Taiwan. They discovered that the major change patterns were difficult to predict and recommended that freshmen students participate in career exploration programs.

While the number of undecided students is difficult to predict researchers have been much more successful at identifying the characteristics of students who are known to be undecided. Since the mid-to-late 1970s, researchers described the stigma associated with undecided students. Fullerton and Britton (1976) say that students who entered college undecided were often thought of as an unproductive expense both to society and to themselves. It was well-established in the earlier literature that undecided students have lower self-efficacy (Bandura, 1997), lower confidence in decision-making (Gordon, 1998), higher anxiety levels (Santos, 2001), low levels of psychological separation towards parents (Santos, 2001), a poorly defined sense of identity (Fuqua & Hartman, 1983), and are less likely to be retained (Gordon, 1994) than students who enter college decided.

It is then understandable that undecided students are more likely to have psychological and emotional stress. Gallagher (2006) found that 35.5% of undecided students felt overwhelmed and were unable to function because they felt depressed. In a 2004 study published by the Higher Education Research Institute, 77% of juniors reported feeling depressed frequently or occasionally during the year and 61% of these students reported feeling depressed the first year that they entered college. Since the time that this study was conducted, both the economic and employment trends have declined. Now, more than ever before, students' anxiety levels about college are the driving force behind a rapid increase in mental health concerns among college students (Fleming, 2011). According to a report by the American Psychological Association (APA, 2010) over the past 10 years there has been a 10% increase in the number of students on psychiatric medicines in college.

Santos (2001) highlights the fact that undecided students are a large diverse group and that there are varying types of indecision. He further asserts that despite the existing controversy about the varying types of indecision, there is general agreement pervasive in the research that simple or developmental indecision associated with developmentally appropriate exploration of alternatives (selecting a major) can be differentiated from generalized indecision which reflects extreme difficulties in making life-altering decisions. Gordon (1998) concurs that undecided students are a very diverse group. Many researchers have attempted to categorize undecided students and differentiate them from decided students (Crites, 1998; Gordon; 2007; Gordon & Steele, 2003; Savickas, 1989). After conducting an extensive review of the research literature about undecided students Gordon (2007) re-categorized undecided students into seven subgroups: "chronically indecisive", "seriously undecided", "developmentally undecided", "tentatively undecided", "unstable decided", "somewhat decided", and "very decided."

The more recent studies of undecided students have tried to identify those students who are indecisive from those who are undecided for other reasons. Indecisiveness and indecision are two very different states (Crites, 1998). He explains that indecisiveness is a trait that tends to pervade one's total life and is the result of maladaptive habits and thinking. He further states that indecisive individuals are often unable to make a decision even when they have access to all the information necessary to do so and all other conditions needed to make the decision--such as freedom to make a choice, incentive to make a choice, and supply of choices are met. Indecision is a more temporary developmental state that can be changed when one has the information and resources needed and necessary conditions are met (Gordon, 2007). Hartman and Fuqua (1983) studied students who were chronically undecided and noted the association between indecisiveness and anxiety and psychological dysfunction. Gordon (2007) distinguishes the developmentally undecided from the chronically indecisive student. She highlights the importance of recognizing that developmentally undecided students' self-efficacy increased over time.

Gordon (1984) suggests that the label undecided be abandoned and recommends the use of exploratory or *investigative* to describe the "new" undecided students. She also emphasizes the positive attributes of developmentally undecided students and states that many students are undecided because they have a diverse range of interests which spans many different subject areas. These students choose to delay their commitment to a major until they have enough information and experience to make an informed decision about their major and/or career. Gordon (1984) believes this time taken to explore should be encouraged and describes exploratory students as intentional critical thinkers who are reflective and very deliberate. Gordon's (1984) description of undecided students sounds very similar to the critical and creative decision-makers that employers say they need to recruit into their workplaces but are unable to find in sufficient supply (Johnson, 2011). The creative and critical thinking skills and attributes that make a student successful in the workplace are evident in the student who is knowingly undecided and chooses to make an informed decision. The front-end career exploration experience is proving beneficial to students and the career decision-making skills gained as part of this experience will actually serve student well in their post-college career (Creed, Patton & Padeaux, 2006; McLean et al., 2010).

The new group of exploratory students. The changing workforce demands and changes in the type of individuals across the nation who need to be educated are shifting the face of indecision and the undecided student. As disciplines blend and world problems become increasingly complex, it has become less important to name a major in college and more important to build a set of skills that are portable across majors. As displaced workers return to college to reposition themselves in the workforce it has become less critical for them to identify a particular major, but more important for them to complement a pre-existing knowledge base or skillset with supplemental learning experiences and skills. Undeclared and undecided students are taking a new form. They are becoming the *new normal* student in higher education (Simon, 2012). It has become acceptable and advisable that students take the time and effort to explore majors, careers, and courses before identifying or customizing their educational experience and desired learning outcomes (Slowinski & Hammock, 2003). It is much more prudent financially and vocationally to make an informed career decision. Employers, legislators, and workers are seeking efficient delivery of educational outcomes and the accurate and early identification of a major has become more important both inside the walls of higher education and to other constituents outside of the college as well (Simon, 2012).

McDaniels et al. (1994) use the label *deciding* students in contrast to undecided students because they perceive the terminology to be proactive and more positive. The deciding label also better reflects the needs of the new undecided student. Thus, college administrators and student support professionals have developed many services and interventions for undecided or deciding students (Gore, 2005; McLean et al., 2007). Colleges have developed courses, advising delivery models, major selection workshops and programs, coaching, learning communities, and many more resources for students who are knowingly undecided (Gordon, 2007). These programs have been well-documented, well-researched, and assessed since the early-1990s. At many large universities there are first year experiences built into the infrastructure of colleges to support undecided students (Steele, 2003). Undecided students have been supported to the extent that they are performing as well as students who enter college already decided on a major. Research findings show that undecided students now graduate at the same rate as a matched cohort of decided students (Gordon, 2007; Micceri, 2002).

Colleges and universities across the nation are forced to *repackage* degrees, customize content delivery, and forecast the need for majors that do not yet exist to create a workforce that can solve complex world problems (Simon, 2012). For the aforementioned reasons undecided students are beginning to be viewed more positively (Cuseo, 2005; Gordon, 2007). Some researchers actually advocate that students take the time to explore majors and careers before declaring a major (Cuseo, 2005; Gordon, 2007; Lewallen, 1993). The stigma that was once associated with front-end major exploration is diminishing. Graunke et al. (2006) researched the impact of institutional commitment and commitment to a major in first year students on the likelihood of degree completion. They found that commitment to a major or a perceived state of being decided was inversely associated with graduating from college. Colleges are trying to be much more intentional about building an exploration experience for the undecided student into the infrastructure of the organizations (Gordon, 2007; Cuseo, 2005). However, the research does not reflect much success in infrastructure and policy improvement that better accommodates the developmental career decision-making needs of students.

Redeciding exploratory students. The traditional student who enters college undecided is very visible and demands and acquires needed services (Gordon, 2007). However, the new group of undecided students is a population of undecided students who are quite invisible (Staley, 2014). They are admitted into the university as decided students. They are enrolled in majors all across the university yet make little to no progress towards the degree in which they are enrolled. These students, sometimes referred to as phantom majors by university support professionals and practitioners, are at-risk but undetected. They are hidden amongst their decided peers and struggling to find their way (Gordon, 2007). Even when educators and researchers attempt to count the numbers of undecided students, they routinely overlook the undecided students who entered the university decided, but somewhere along the educational experience became undecided and needed *to* redecide on a different and more suitable major. Because the redeciding student is hidden, no one is seeking them out to provide services and these redeciding students are at a higher risk of dropping out or stopping out of college (Staley, 2014). Even when redeciding students are retained, they may have a prolonged time to graduation if they don’t make a timely decision to change majors.

The results of the EAB (2014) study also reflected that 18% of students in a nationwide sample of 110 institutions were adult degree seekers who did not have an established career plan or goal. They labeled this group of students *academic wanderers*. This group of students is very similar to the student described in this paper as redeciding. Though they did not have clearly established career goals these “academic wanderers” were found to be extremely cost conscious, believed that their degree would open doors to new opportunities, and were adult degree seekers without an established degree plan (Staley, 2014). The research report also describes five other diverse student groups that are rapidly increasing on college campuses in the U. S. These subgroups included 24% *aspiring academics* who are traditional aged students, interested in internships and research opportunities, and come from higher-income families. Some 11% of the sample were labeled *coming of age* because they considered college a standard requirement for success, had no defined career path to explore options, and were interested in a residential experience. Approximately 18% of the sample surveyed by Staley (2014) was referred to as *career starters* who were career-driven and focused. They enrolled with a major in mind and wanted to get started on their career as soon as possible. Some 21% of their sample was referred to as *career accelerators* who were working adults seeking to attend college part-time, had some previous college experience but no degree, and were interested in online options and competency-based credit. The last 18% of the group surveyed were referred to as *industry switchers* who were seeking to start a career in a completely different field, highly focused on job placement, and were very cost conscious so they had a preference for online and hybrid course options (Staley, 2014). Other researchers describe the same groups of students, although not comprehensively, as the changing student population in higher education (Diel-Amen, 2011). These groups reflect the complexity of career decision-making needs now represented in the academy.

Staley's (2014) results also showed that most undergraduate students who drop out of college leave in good standing and have completed between 4.5 and 5.7 semesters. The students also have between a 2.0-3.0 grade point average. In further analysis of this group they found that students who finish their first year with a grade point average of less than 2.0 are not likely to graduate, and those who finish with a 3.0 are highly likely to graduate. However, they suggest that college administrators pay closer attention to the students in what they describe as the *murky middle* because they may be more easily retained than the at-risk first- year group who have been given most of the support. Several researchers advocate shifting resources from the first-year group to support those students in the middle (Tyson, 2014). Further study is necessary for these middle students (2.0-3.0 grade point average) because the number of students in this group who drop out of college is very similar to the number of students who graduate. Little attention has been given to this group in the literature.

There was a paucity of research studies that explored these students in the murky middle. Research suggests that 50-60% of all first year students enter college undecided and 77% of all first-year and sophomores are undecided (Freedman, 2013; Gordon, 2007; McDaniels et al., 1994). Tyson (2014) says that colleges are very hesitant to shift support funding away from high-risk groups to groups that are not as high risk even though they may impact the success of more students. The research evidence clearly shows that changing majors can impact a student's ability to graduate and graduate in a timely manner. To prevent dropout and to increase graduation rates for redeciding students will require advisors, student support professionals, and administrators to rethink and reframe the manner in which services are provided to this population of students (Gordon, 2007; Staley, 2014). Traditional advising and support models continue to be effective for some groups of exploratory students. However, students who enter college decided but need to redecide later in their college experience will need an intentionally designed strategy that addresses their career decision-making needs, the exploratory process, and also the psychological and emotional well-being of the student (Gordon, 1994).

Redeciding students who entered college decided have often developed relationships with faculty, staff, and peers in their major of choice. These networks are dismantled when they are forced to detach themselves from these networks and identify a new major. Their support networks are being dismantled at the same time that they are most in need of academic and psychological support. This leads to feelings of isolation, and students are more likely to lose their sense of self-efficacy and belonging through this transition (McDaniels et al., 1994). Additionally, there continues to be pressure for students to be decided when they enter college (Gordon, 1984). The stigma to declare majors is perpetuated by parents and peers more than it is by administrators who now have some data that helps them to better understand students' need for exploration. Some students select a major at the onset of their college experience, whether they are decided or not, to avoid this stigmatization from their peers. However, the stigma associated with redeciding is even greater than that associated with entering undecided. The need to solicit help in decision-making near the end of the college experience is much less popular and less acceptable than it is to solicit help at the beginning of the college experience (Steele, 2003).

Redeciding students are likely to have financial problems because taking longer to graduate equates with increased cost to complete their education. The longer the students are enrolled in college, the more debt that they will accrue (Cook & Pullaro, 2010). Not only are they putting themselves at-risk financially for their extended stay in college, but they are also a strain on the college or university's retention and graduation rates. While retention is a concern for redeciding students, graduation is a much bigger concern. Colleges and universities must create infrastructure, support, and services to facilitate career decision-making and career development in redeciding students. All students, but especially redeciding students, must be provided the support necessary to help them graduate in a timely fashion and to help them develop the skills and experiences that foster a successful transition out of college and into the workforce.

The research literature well-documents that redeciding students are at-risk of not completing college and that they tend to be growing in number (Gordon, 2007; Micceri, 2002). Benton et al. (2003) conducted a 13-year longitudinal study to review trends in problems experienced by college counseling center therapists. They found that vocational and educational problems decreased during the first five years of the study but increased in the second half of the study. Referencing R.B. Culiffe's research published in 1927, Gordon reports that he surveyed entering college students as early as 1927 and found that only 9% of the students were undecided. However, researchers now concur that the number of entering undecided students is closer to 75-80% (Gordon, 2007; Staley, 2014). They further emphasize the developing trend and significant increase in students who were challenged with career decision-making problems and recommended the development of intentional career services as well as an increase in career counseling.

Career Decision-Making in First Generation College Students (FGCS)

FGCS represent 27% of all high school graduates (Gibbons & Shoffner, 2004). First generation college students are 1.3 times more likely to leave college at the end of their first year of college than other students (Ishitani, 2006). Research data show that 24% of first-time first-year students are both low-income and first generation (Staley, 2014). Additionally, 89% of low-income, first-generation college students leave college after six years without a degree and the drop-out rate for low-income students is four times higher than that of their higher-income peers (Staley, 2014). FGCS are seven times more likely to complete a bachelor's degree if they were enrolled in a four-year college. Only 25% of FGCS enroll in four-year colleges (Chen, 2005). Changing the graduation and retention rates of FGCS could make a significant positive impact on changing the graduation rates for the nation.

Institutional barriers. FGCS have unique career decision-making challenges that can make them even more at risk of career indecision than their higher income peers (Wiljanen, 2003). They face many barriers that may limit the experiences and information needed to make sound career decisions such as limited access to role models, financial stress associated with college cost, tendency to have first generation parents with limited information about education and college, family pressure to enter the workforce after high school, and under-preparedness for college coursework (Chen, 2005; Choy, 2001; Engle &

O'Brien, 2007; Horn, Nunez, & Bobbit, 2000; Sickles, 2004). FGCS are also more likely to attend college closer to home, delay college after high school, be older than the traditional-aged college student, attend college part-time, live off-campus, and work full-time while enrolled in college (NCES, 2005). These barriers differently shape the career development, career decision-making, and both the academic and career goal attainment of FGCS (Gore, 2005; Ting, 2003).

Stephens, Markus, Fryburg, Johnson, and Covarrubias (2012) posit that American universities' tendency to focus on independence is a *cultural mismatch* for FGCS who are motivated by reasons of interdependence to attend college. They found that representing the university's culture as interdependent (sense of community) rather than independent (finding one's own way) reduced student's perceptions of difficulty. Stephens et al. (2012) recommend that colleges should focus efforts to support FGCS on eliminating cultural barriers that impede student success.

Olenchak and Hebert (2002) report that FGCS are more likely to feel guilt when they do not pursue the goals that their parents want them to in college because their parents have sacrificed so much for them to be able to attend college. These students are often torn between their parents, peers at home, peers in college, and perplexed by the college-going culture (Coffman, 2011; Stieha, 2010). For this reason FGCS might not be as open to the career exploration and career development process. They are more likely to select college majors early and stay enrolled in unsuitable majors in which they have no interest in an effort to please parents and impress peers (Olenchak & Herbett, 2002). Also, because their parents have not attended college many FGCS are more likely to establish unrealistic outcomes, goals, and expectations about careers and majors due to their limited exposure to and experience with college and careers.(Garriot, Flores & Martens, 2012; Hicks, 2003; Olsen, 2009).

The negative influence of environmental and demographic factors on the career development and decision-making of FGCS extends beyond the higher education arena into the students' career following college. Some researchers describe perceived barriers related to prejudice and social justice that impact the academic and career success of FGCS (Patel, Salahuddin, & O'Brien, 2008; Rollins & Valdez, 2006). Others emphasize the impact of social, political, personal, and environmental barriers that impact the students' success (Gladieux, 2004; Oliverez & Tierney, 2005). However, whether career barriers are perceived or real, the research clearly reflects that these barriers diminish students' level of confidence and generate the tendency in students to avoid and/or delay making critical career decisions (Grier-Reed & Ganuza, 2012). Bandura (1986) defines this lack of confidence in one's ability to successfully complete a given career-specific task as career decision- making self-efficacy. He emits that perseverance despite obstacles, successful performance in future related tasks, and the willingness and/or motivation to perform a given task are positively associated with a student's self-efficacy.

There is a plethora of studies regarding the impact of contextual and personal factors such as socioeconomic status can have on career decision- making (Lent & Brown, 1996; Sheu et al., 2010). Some researchers argue that the impact of contextual support and barriers have an indirect rather than a direct impact on career interest and career choice (Lent, Brown, Nota, & Soresi, 2003; Sheu et al., 2010). They found that self-efficacy tends to mediate the impact of contextual barriers on career interest and career choice. The direct effect of contextual variables on choice was small when compared to the indirect effect (Lent et al., 2003; Quimby & O'Brien, 2004). Interest and choice were more strongly related when contextual barriers were low (Lent et al., 2003). This relationship between contextual variables and choice might explain why FGCS students are not well-represented in prestigious careers or higher paying jobs (Fouad & Byars-Winston, 2005). The underrepresentation of FGCS has already been substantiated earlier in this study.

Socioeconomic status (SES). The literature makes it clear that there is a relationship between socioeconomic status and career decision-making (Engle & Tinto, 2008; Grier-Reed & Ganuza, 2012; Hsieh & Huang, 2014; Parks-Yancey, 2012). Engle and Tinto (2008) confirmed that socioeconomic status impacts job and career related experiences. They further found that socioeconomic status impacts one's confidence and perceptions about their ability to be successful in high profile careers. Ultimately their results showed that individuals from higher SES tended to accomplish higher levels of education and were more likely to be exposed to early work and career experiences. Other research studies also establish that SES is positively related to educational aspirations (Schoon & Parsons, 2002); educational expectations (Mello, 2009); math self-efficacy (Navarro, et al., 2007); and career decision-making self-efficacy (Huang & Hsieh, 2011). But low SES is negatively associated with dissatisfaction with career in women particularly (Bullock-Yowell, Peterson, Reardon, Leierer, & Reed, 2011).

Summary. These studies offer great insights into why FGCS students might have more difficulty making decisions about a major in college. They also offer a rationale for the gap in achievement of FGCS students in particular STEM fields. The limited academic achievement, limited attainment of higher paying jobs and careers, the tendency for FGCS to attend colleges that are not selective, increased debt accrued trying to complete college, and longer times to degree completion are reflected extensively in the research literature. Little research addresses what happens during the college experience that impedes FGCS students' ability to graduate in a timely fashion. If career decision-making is impacted differently in FGCS students then it logically follows that their major-changing patterns might be impacted by career decision-making self-efficacy as well (Lent et al., 2003). Most of the research on major choice and FGCS focuses on the impact self-efficacy has on the students' academic success. Less research focuses on the unique impact career decision-making self-efficacy might have on major-changing behavior in FGCS and how that impact consequently limits their success in college. This study is an attempt to understand how FGCS's career decision-making self-efficacy and major- changing patterns impact their ability to successfully complete a college degree.

Major Change and College Success

Students' initial majors are rarely ever well-informed and rarely employ sound career decision-making strategies (Gordon, 2007). More often than not major choices are made prematurely with little exploration or thought given to the selected major (Gordon, 2007). Instead, students are more likely to select majors due to parental pressure, popular culture, high predicted salary potential, and peer pressure (Beggs, Bantham, & Taylor, 2008).

Theophilides, Terenzini, and Lorang (1984) surveyed entering freshmen at a large public university and found that 15% of his respondents had changed their major by the end of the first year and 45% changed their major during those first two years.

Major-changing frequency. Montag, Campo, Weissman, Walmsley, and Snell (2012) indicate that between 40-85% of all students change their major at least once before they graduate from college, and as many as 10% of students change their majors at least four times. Willingham (1985) found that only 30% of students graduated in the same major in which they enrolled upon admission to college. A Chen (2005) study showed that the number of students who change majors at least once is closer to 80%. Staley (2014) studied a sample of 2,693 students across 50 different institutions and found that 75% of students changed majors at least once. The earlier literature reflects that 40 -50% of students change their majors (Foote, 1980; Noel, 1985). But more recent studies reflect that 75-80% of students change their majors at least once. The number of students who change their majors in college is clearly increasing as time progresses. Kramer, Higley, and Olsen (1994) report over the course of their longitudinal study from 1980-1989 the percent of freshmen who changed majors rose from 46% in 1980 to 68% in 1989.

Defining major-change. There is some variation in the research literature about the definition of the term “major change.” Virginia Gordon refers to students who enter college decided but later change their minds and choose to make an alternate decision about a major as *major-changers* (Steele & McDonald, 2008). Earlier Gordon (1984) referred to these students as deciding students. Deciding students, redeciding students, and major-changers share the similarity that they will choose an alternate major. However, a clear distinction should be made between the student who chooses to change their major and those who are forced to change their major. The latter student who is forced to change majors by university policy or lack of progress in the chosen major is better defined as the redeciding student as it will be used in this study.

Characteristics of major-changers. The characterization of major-changers is equally as ambiguous in the research literature as is the definition of major-changers. Major-changers, undecided students, and deciding and redeciding students are all used synonymously throughout much of the literature. Each group of students (undecided, deciding, redeciding, and major-changers) experience very different circumstances; however, there is little distinction made between the groups in the research literature (Chen, 2005; EAB, 2014; Gordon, 1984; Gordon, 2007; Steele, 1994). They are generally reflected as one group but warrant individual attention. Virginia Gordon (1984) has focused much of her recent research on distinguishing the redeciding student from the deciding students. She conceptualizes seven different categories of undecided students: the “very decided,” “ unstable decided,” “ somewhat decided,” “tentatively undecided,” “developmentally undecided,” “seriously undecided,” and “chronically indecisive.” She further identifies the characteristics of each type of student but still does not separately capture the redeciding student in any particular category. The rediciding student can be represented in any of the seven categories.

Gordon also extended her research of undecided students and found that there were six types of major-changers (Steele & McDonald, 2008). She describes the six types of major-changers as follows: “drifters,” “closet changers,” “externals,” “up-tighters,” "experts," and "systematic." Gordon's conceptualization of categories distinguishes those students who are willing to explore from those who are forced to explore (Gordon, 2007). She describes drifters as those students who realize early in their college career that they have chosen a major that is not the best fit but they delay participating in an exploration process. Closet changers are students who change their major without telling others or without notifying their academic advisor. These students may be particularly worried about how others may perceive their major change.

Externals are quite content changing majors and may change majors frequently trying to identify a perfect fit major or trying to avoid making a wrong choice. Externals typically gather information from anyone in their social network but are less likely to participate in formal exploration of a major before changing. Up-tighters are those major-changers who have been denied admission into their initial choice of a fairly selective major and may have unrealistic expectations about their skills and abilities or unrealistic expectations of the aptitude and skills necessary to successfully complete their major of choice.

Experts also have not participated in a formal exploration process but they proceed through the major as if they have made a well-informed decision. These students are often unwilling to change majors despite their poor performance. Systematic major-changers are knowingly in need of exploration and willing to investigate alternate options for a major. They usually will request the support that they need to make an informed decision (Gordon, 2007).

Gordon (2007) further recommends counseling approaches and advising services that best address the needs of each type of undecided student and major changer. However, she does not address contextual barriers that may also impede the student's success. While the redeciding student warrants a more comprehensive cognitive and person-level description to distinguish them from other groups of deciding students or major-changers there is a paucity of literature that addresses contextual factors that may be positive and negative.

Challenges to degree completion. Redeciding students bring a new phenomenon that can be both a challenge and an opportunity to higher education institutions across the nation. Accommodating the need to change majors is challenging for many colleges because, historically, changing majors has been viewed unfavorably and was thought to increase time to graduation. However, the results of several studies in recent years show that changing majors actually increases the chance of graduating as well as increases the completion rate (Foraker, 2012; Micceri, 2002). Micceri (2002) and Foraker (2012) conducted studies in Chicago and Florida that both showed students who have the ability to change their majors graduate at higher rates than those students who do not change from their original major. Foraker (2012) also found that a student's likelihood of graduation increased by 40% with each major change and changing majors more than once increases the chances of graduating. This finding was consistent across all majors (with the exception of dance) but only if the institution had policies and processes that make the transition across majors easy. For this reason many institutions are examining their policies and practices to determine how to better accommodate the inevitable need for students to change majors.

The research suggests that the act of changing majors does not necessarily cause a delay in graduation unless major changes occur in the latter two years of a student's career (Kramer et al., 1994; Staley, 2014). Kramer et al. (1994) found that 71% of students who changed majors persisted for four years compared to 33% of students who did not change. Also, 54% of students who changed majors graduated in four years compared to 23% of those students who did not change majors. The EAB (2014) conducted analysis across 41 different four-year institutions to discover that 11% of students make their last major change after their fifth semester in college. A student must be enrolled 12 hours generally to be considered fulltime. This means 11% of students are changing majors after 60 credit hours (EAB, 2014). EAB (2014) research further confirmed that students who change majors after 45 hours are more likely to extend their time to degree completion. Some 20% of undergraduate students graduated from college with more than 150 credits--a full year of extra coursework and additional tuition costs.

Slaney (1984) found that college women who had stable majors had higher grade point averages. The research literature is clear that graduation rate and progress towards a degree are most impacted by the timing of the major change rather than the act of changing one's major. Smart, Feldman, and Ethington (2000) uses John Holland's (1973) conceptualization of job themes to compare initial major choice to final major choice upon graduation across Holland Code categories. Holland Code themes include Artistic, Conventional , Enterprising, Investigative, Realistic, Social (Holland, 1973). He found that students in the Social category were much less likely to change majors than those in the Enterprising category who were the least likely to change majors. Kramer et al. (1994) found that students who became dissatisfied with a declared major that they selected when they were admitted to college were likely to change to a completely different area of study. Their results reflected that 32% of students change majors in their junior year and 13% changed majors in their senior year. Redeciding students who have accrued a substantial amount of college credit can be a challenge for advisors and administrators. It is difficult for advisors to help them identify suitable majors that will utilize all of their accrued credit from their first attempted major (Gordon, 2007). Chase and Keene (1981) found that students who changed their major after their fifth semester were more likely to have lower grades and have accumulated fewer credit hours. This pattern of late major changing among redeciding students will likely cause them to prolong their time to graduation as they transition from one major to another haphazardly trying to find their way to academic success (Micceri, 2002; Staley, 2014).

The process of selecting a major is a critical part of the transition to college that today's students have to manage (Steele, 1994). It is undoubtedly one of the most important career decisions that a college student has to make. Now, more than ever before, students need career development and career decision-making support as they prepare to enter a workforce in which the only constant is change and the need for a college degree is critical. The unstable employment trends are making students more anxious about their major choices, and they are choosing majors that lead to high-paying jobs rather majors that are matched to their interests (Malgwi, Howe, & Burnaby, 2005; Pijanowski & Brady, 2009). The tendency to do this increases the likelihood that students will need to change majors more frequently.

Major Choice and College Success

United States Bureau of Labor Statistics (2012) data show that jobs in the STEM fields are projected to increase faster than other types of jobs. There is a new national emphasis on the importance of increasing the number of STEM majors to make the U.S. more competitive in the world economic market (American College Testing [ACT], 2015; Xu, 2013). Students now feel increased pressure and anxiety about major choice (Weinstein, Healey, & Ender, 2002). Some researchers suggest that this increases the propensity for students to select majors that are not matched with their interests, skills, and abilities but make the decision instead based upon projected salaries (Gordon, 2007; Malagwi, Howe, & Burnaby, 2005). Freeman and Hirsch (2008) conducted a study that correlated wage and employment data with knowledge content areas from the Occupational Information Network. In doing so they discovered that college major choice was responsive to occupational content of jobs and wage returns were responsive to the type of knowledge.

Factors that influence major choice. While there is an abundance of literature that addresses major choice and college success, researchers do not all agree that major choice, alone, makes a difference in a student's ability to complete college. Most of the literature has addressed the factors that impact major choice. Generally, this literature has focused on academic performance and academic preparation for a given major (Darwis & Lofquist, 1984). Much less of the research literature focuses on how changing one's choice of major impacts their ability to be successful in college. Only recently have researchers begun to study the impact of major selection and major choice on student success (Maokler & Kim, 2014). And it has been even more recent that researchers have connected the ability to change one's major choice to academic success (Chen & Soldner, 2010; EAB, 2014; McLean, et al., 2007).

Academic preparation and performance. If students are not prepared for college then they will have to work harder to be successful in college. If they start out underprepared they will need to take additional time and courses to get prepared and then graduate from college (ACT, 2014). Academic preparation also accounts for some of the variance in major choice; however, even when controlling for the effect of academic preparation there continues to be significant variance in major choice (ACT, 2014; Allen & Robbins, 2008). Malgwi, Howe, and Burnaby (2005) found that interest in the discipline is the best predictor of college major choice for women and the second-best predictor for men. Men are more likely to choose a major due to salary potential and career advancement. They do so despite the fact that there is little empirical evidence and a great deal of disagreement among researchers whether one’s choice of major actually affects career success (Dietz, 2010; Porter & Umbach, 2006).

Identification of a major. Much of the research literature on major choice discusses transition into and out of particular fields of study and the impact of certain background characteristics on choosing and successfully completing specified majors, such as STEM fields. Results of a study funded by the Higher Education Research Institute showed that only 24% of students who graduated high school had an interest in STEM majors and only half of those students actually majored in a STEM field in college (Pryor, Hurtado, DeAngelo, Blake, & Tan, 2009). Much attention has been given to the best strategies for attracting and graduating particular populations into STEM majors (King, 2008). While over 80% of students who graduated with STEM majors initially enrolled in a STEM major as in-coming freshmen, very few students change into STEM majors later in their college careers

(Dickson, 2010). However, social science majors are more likely to start off undecided and change into a social science major. According to Dickson (2010), 47% of the students who graduate with social science degrees begin college undecided and 25% of natural and physical science majors start college undecided. Chen (2014) studied attrition into and out of STEM majors and found that students who declare an initial STEM major but then switch into a non-STEM major are more likely than other students to drop out of college. Chen (2014) found that 69% of all bachelor degree students and 48% of all associate degree students entered STEM fields between 2003 and 2009. He found that half of these STEM majors switched into non-STEM majors and the other half left college without earning a degree or certificate.

Parental influence. Parents have a significant influence on major choice. Beggs, Bantham, and Taylor (2008) discovered that students were less likely to do research to identify a major and more likely to be influenced by their family and friends. According to Choy (2001), parents of FGCS often discourage them from attending college and may give them advice that makes them more likely to doubt their academic abilities and to have less confidence in their ability to pursue certain majors. Engle and Chen (2008) found that there is often a disconnect between first generation students and their families who may even criticize them for attending college. Both the FGCS and their parents lack the information needed to understand how to make sound decisions about college majors and how to navigate the college environment when they encounter decision-making difficulties. Vargas (2004) found that first generation high school students tend to have aspirations about occupational and educational attainment that are similar to their peers. However, he further discovered that their understanding of how their high school courses and grades are related to academic and career success is limited by their lack of experience with the college environment. Additionally, their parents are generally unable to inform their decisions and understanding because they also have little or no experience with the college environment (Vargas, 2004).

Interest-major fit. Kim, Markham, and Cangelosi (2002) identified interest in the career and job opportunities as primary determinants of major choice and parental influence as a secondary influence. Allen and Robbins (2008) used an interest-major fit score and first-year academic performance on a sample of 50,000 students to predict whether or not students would be retained in their selected major. They found that interest-major fit and first-year academic performance did predict whether a student would stay in a particular major. However, waiting to determine if students will not perform in a major is detrimental to student success. As we know from previous research mentioned earlier in this study, students who perform poorly and have less than a 2.0 at the end of their first year are rarely ever retained (Staley, 2014). It is more cost-effective and prudent for students to spend time exploring majors to make an informed decision on the front end than it is to have them select a major that they will later need to change (Gordon, 2007; Micceri, 2002; Steele, 1994).

Taken together, the literature renders that coaching and recruiting students into particular majors is not a good idea if the students have no prior knowledge, experience, or interest in the major. However, it has become a common practice among college recruiters and guidance counselors to recruit students into certain programs, particularly STEM programs (Hanover Research Group, 2014; Lynch, 2013). Adams (2013) found that high school students' choice of major rarely matched their interests and strengths. She further discovered one-third of students who took the ACT College Entrance Exam planned to major in a subject that was a mismatch for their interests. Her results rendered 32% of the students selected a poor fit major while 36% chose a good fit. This mismatch of interests and major provides insight into why there is a growing tendency toward changing majors once students begin college.

Porter and Umbach (2006) discovered, in addition to racial and ethnic differences, political views, major uncertainty, and four personality types were related to major choice. Allen and Robbins (2008) conducted a study using a sample of more than 50,000 students from 25 different institutions to determine if academic major persistence could be predicted by first-year academic performance. Their research identified a relationship between interest-major congruence and major choice, and confirmed that academic performance and interest-major fit together predict whether or not a student will persist in their chosen major. The research literature is clear that academic skills do not independently predict major persistence (Allen & Robbins, 2008; Porter & Umbach, 2006; Tracey & Robbins, 2006). However, even when academic preparation and performance is accounted for a significant amount of variance in major choice and major changing patterns continues to exist. Tracey and Robbins (2006) studied the impact of interest-major congruence on academic major choice and found a positive relationship between interest-major congruence and retention after controlling for academic preparation. So, while academic preparation is not a predictor of major change or persistence, researchers found that high levels of interest-major congruence is associated with high retention and graduation rates.

Career decision-making readiness. Evans et al. (2010) posit that students are not developmentally ready to make a decision about a college major at the end of high school or the beginning of college. They cite William Perry's (1981) conceptualization of nine stages of cognitive development as evidence and suggest that students at this age are in a stage described as *dualism*. In this stage youth are cognitively unable to consider several options in their self-reflection. They believe that there is one right answer and all the other options are wrong. Perry (1981) further states that it is in the later stages of multiplicity or relativism when students are able to cognitively comprehend that several options exist and there is not always one right answer in a given situation.

Race and ethnicity. While a mismatch in interest might explain some of the variance in major choice, there are other factors that have a significant impact on major choice. The literature clearly substantiates that there is variation in major choice by race and ethnicity (Dickson, 2010; Nores, 2010). Nores (2010) studied major choice by citizenship at two public universities in Texas. He found that students who were not U.S. citizens were more likely to select STEM majors. In a study of the impact of race and ethnicity on major choice, Dickson (2010) found that Asian, American Indian, and other males with unspecified ethnicities were more likely to major in engineering and computer science than White males in their first year of college. Additionally, Black and Hispanic males were slightly less likely to choose engineering and computer science than White males. Dickson (2010) also found that White males were less likely than other males to choose majors in the physical or natural sciences. The study further revealed that African American males were more likely than other males to be undecided at the beginning of their college career. Further analysis showed that African American females were underrepresented in business, engineering, and computer science fields but overrepresented in the social sciences, natural, and physical sciences. Relative to the total number of Hispanic graduates, Hispanic males are overrepresented in engineering and computer science but underrepresented in the humanities. Hispanic females are overrepresented in the humanities but underrepresented in engineering and computer science.

Gender. Dawson-Threat and Huba (1996) found that two-thirds of males and three-fourths of females chose careers that were dominated by their own gender. In more recent times there has been an increase in females who choose male-dominated majors but no change in the percentage of males who choose female-dominated careers (Dickson, 2010). Men are more likely to graduate from selective and doctoral granting institutions while women are more likely to graduate from liberal arts and bachelors degree granting institutions (Simpson, 1998). While women are enrolling in male-dominated majors at higher rates they are not graduating in these majors. Women are more likely to change majors--particularly women who initially enroll in STEM majors (Dickson, 2010). Gender differences in choice of a major are reported to be more significant than racial and ethnic differences in choice of college major (Dickson, 2009; Gordon, 2007).

Chapter 3

Method

The primary purpose of this study is to determine the differences in the levels of career decision-making self-efficacy and program major changing behavior between first-generation and other college students enrolled at a major research institution in the University of North Carolina System.

Research Questions

1. What are the differences in the levels of career decision-making self-efficacy scores between first generation college students and other college students?
2. What are the differences in the GPA of FGCS who changed their major and FGCS who did not change their major?
3. What are the differences in the levels of career decision-making self-efficacy scores between first-generation college students who changed their majors and FGCS who did not change their major?

Research Design

A two-group comparison survey research design using both an online scale and existing data will be used to determine if differences in career decision-making self-efficacy and major changing behavior exist between first generation college students and non-first generation college students. Survey research designs are appropriately used to examine variables without manipulating them (Ary, Cheser-Jacobs, Sorenson, & Walker, 2010). A survey design is a quantitative methodology that should be used to gain understanding of beliefs, values, and/ or opinions of a representative sample of participants (Creswell, 2008).

Survey research provides the opportunity to gather data from a large sample in a cost-effective manner. Survey designs provide flexibility in delivery location and close proximity to participants is not required (Creswell, 2008). The survey that will be used in this study will be a standardized questionnaire, the Career Decision Self-Efficacy Scale--Short Form (CDSE--SF). The utilization of a standardized survey makes it easier to achieve high reliability and can facilitate a rapid collection and analysis process (Creswell, 2008). The CDSE--SF is administered through a website managed by Mind Garden Incorporated. Using internet-administered surveys can limit the amount of time needed to conduct research because the participants enter their own data and the data is stored on the website. However, obtaining an adequate response rate can sometimes be a challenge when using online surveys because participants are more likely to complete surveys if they are administered manually (Creswell, 2008).

While survey research provides many advantages it can also be inflexible because use of a standardized tool requires that the data collection methodology remain unchanged throughout the data collection process (Creswell, 2008). Additionally, the questions on the survey are developed generally to be appropriate across all participants; however, the questions may be so generalized that key information relevant to particular subgroups of the participants may be missed in the data collection process (Bordens & Abbott, 2002). Surveys also tend to have high reliability but limited validity because the responses of the participants must be captured in the categories provided on the instrument. Often it is difficult to capture the respondents' exact feelings given the limitations of the categories that are provided on the survey instrument.

Online surveys and email surveys can introduce additional limitations to the study. Hamilton (1999) suggests that there are four ethical issues that researchers need to consider when using online surveys (sampling errors, identification of respondents, anonymity, and confidentiality). Researchers are bound by ethics to use samples that are representative; however, participation in the study may be limited to those respondents who have access to the technological resources required to respond to the survey. According to Dillman (2000) online surveys tend to have higher response rates but it is difficult, if not impossible, for researchers to know who has responded to the survey. Email surveys also eliminate the ability to maintain anonymity since the researcher will always have the email address from which the survey was completed (Dillman, 2000). Ethically, researchers are expected to protect the confidentiality of their respondents.

Another common concern when using online or email surveys is the increase in the number of surveys that are returned incomplete (Wright, 2006). The researchers have limited opportunities to encourage completion when using online survey instruments. Thus, the likelihood of non-response bias and response rate error is increased (Wright, 2006). Stanton (1998) also highlights that *satisficing* can challenge the validity of a study when using online survey methodology. Satisficing is the tendency for respondents to answer questions quickly and haphazardly without giving sufficient thought to answering survey questions accurately (Stanton, 1998). He suggests that researchers offer motivation and/or incentives for survey completion. He further recommends that survey questions be developed and worded clearly and succinctly to encourage satisfactory completion of survey questions. However, other researchers caution against offering incentives suggesting that respondents may have a tendency to complete the survey multiple times to increase their chances of getting the incentive (Wright, 2006).

Survey data for this study was obtained from an online version of the Career Decision Self-Efficacy Scale-Short Form. The researcher surveyed both students whose parents graduated from a four-year college and students whose parents who did not graduate from a four-year college (first generation). The Career Decision Self-Efficacy Scale-Short Form assessed the following subscales: self-appraisal, occupational information, goal selection, and planning and problem solving. The students' grade point averages and number of major changes were collected from the Office of Enrollment Management and Services. The study examined the grade point averages of FGCS who changed majors and those who did not change majors. The study also examined levels of career decision self-efficacy scores of the two groups of students to determine if differences exist in their major changing patterns.

Participants

The sample for this study was drawn from the larger population of college students at NC State University who have accrued between 30 and 90 credit hours by the beginning of the spring 2015 semester when the survey was administered.   NC State University is a public research-extensive university that is one of 16 institutions that comprise the University of North Carolina System. Located in the Raleigh, North Carolina, NC State was founded in 1887 as a land-grant institution (NC State University website (https://www.ncsu.edu/) – institutional history). NC State is one of the highly selective institutions in the state. The university enrolls approximately half of the applicants who apply for undergraduate admissions and yields a total enrollment of over 34,000 students of which 24,536 are undergraduates (NC State University Admissions website (https://admissions.ncsu.edu/). The university houses 106 bachelor's degrees, 104 master's degrees, 61 doctoral degrees, and a Doctor of Veterinary Medicine degree. Currently it is the largest university in North and South Carolina. The historical foundations of the institution are grounded in engineering, agriculture, design, life sciences, and textiles (NC State University –institutional history website (https://www.ncsu.edu/about/history-and-tradition/)).

For the fall 2013 semester, NC State University accepted approximately 51.4% of the 20,213 students who applied (NC State University Undergraduate Admissions website (https://www.ncsu.edu/admissions/)). According to the Annual Report of the Standing Committee on Undergraduate Admission 3,787 of the 20,213 applicants reported that they are first generation college students. Approximately 46% of the students admitted to NC State reported that they were first generation. Of those accepted the following reported being first generation: 37% of White students; 62% of African American students; 61% of American Indian students; 26% of Asian students; and 69% of Hispanic students. The average verbal plus math Scholastic Aptitude Test score for students who enroll at the university is 1243. The average weighted high school grade point average is 4.45 on a 5.0 point scale. Of the total enrollment, 45.3 % of the students are female and 54.7% are male. The fall 2013 enrollment data reflects that 73.7% were White, 11.6% were International, 6.4% were African American, 4.8% were Asian American, 4.1% were Hispanic, 3.5% were Multiracial, 2.1% of students did not report any race, 0.4% were Native American, 0.1% were Pacific Islander (Office of Institutional Planning and Research website, (https://oirp.ncsu.edu/wordpress/wp-content/uploads/2015/05/Freshman-Profile-10-Year-Trend.pdf).

Research conducted by the EAB (2014) shows that a student who changes majors after they have completed 45 or more credit hours will likely increase their time to degree completion. It is important to capture this group of students in the study to see if the pattern holds true. Also, it is important to identify participants who have enough college experience and college knowledge that they can inform the study. Therefore, effort was made to identify students who had completed at least one academic year (or 30 credit hours) of coursework in hopes that by this time they would have developed realistic expectations about college work demands and college academic programs. This group was expected to yield mainly college sophomores and juniors who have been in college long enough to have had experiences with and the need to change majors.

The sample for this study was drawn from students enrolled at NC State University. All students who have the requisite number (30-90) of credit hours will be sent the link to the survey website. This population of students is also the group most likely getting lost to multiple major changes after the first year. Researchers have identified this group of students in the murky middle of their college experience as at-risk (EAB, 2014). They have further found that the students most likely to drop out of college have between a 2.0-3.0 grade point average and recommend additional research to explain why this particular group of students is not being retained. Surveying students with between 30- 90 credit hours completed should sufficiently capture those students in the murky middle of their college experience. This population is also expected to yield a sample of students who had been enrolled long enough to have developed some insights about their major based upon their academic experience with the courses, faculty, peers, and the institution.

This study focused on career decision-making self-efficacy in FGCS which has recently surfaced in the literature as a barrier to the success of college students in general, but threatens the success of first generation and low-income students, particularly (Grier-Reed & Ganuza, 2012; Wright, Jenkins-Guarnieri, & Murdock, 2013). Phinney and Haas (2003) emphasized the importance of self-efficacy to effectively cope with stress. As mentioned earlier, low-income first generation college students have more stressors than other college students. Albeit little research was found that addresses how the career decision-making self-efficacy of low-income students and first generation students are particularly impacted when students have to, need to, or are forced to change majors.

The identification of a college major is one of the most challenging career decisions that college students have to make (Gordon, 2007). A student's level of confidence in their ability to complete a career task has been shown to influence their ability to successfully complete the task (Taylor & Betz, 1983). Additionally, a college student's perceived parental support impacts their level of career decision-making self-efficacy as well as their academic self-efficacy and persistence (Horn, Nunez, & Bobbit, 2000). The research literature reflects that financial stress negatively impacts students' career decision-making self-efficacy (Grier-Reed & Ganuza, 2012; Wright, Jenkins-Guarnieri, & Murdock, 2013). As perceived parental support and financial stress are critical barriers for FGCS, more research is needed to understand how their completion of the career decision-making task of identifying and/or changing academic majors differs from that of their non-first generation peers and how this major changing impacts FGCS academic success (graduation and retention) and their career decision-making self-efficacy. Thus, the population of students for this study wasl be both FGCS and traditional college students.

Sample

The sample consisted of 821 students enrolled at a large predominantly White university in the southeastern United States. Some 102 of the 821 responses were excluded because respondents did not complete the CDSE--SF. There were 719 remaining respondents who completed both the demographic survey and the CDSE--SF. A total of 229 of the 719 respondents indicated that they were first generation college students, while seven indicated that they were unsure of their first generation status. There were 483 respondents remaining who indicated they were non-first generation students.

The respondents were then split into two groups for analysis. One group was first generation students and the other group was non-first generation students. To reduce the chance for possible sampling bias and to create similar-sized comparison groups for data analysis, systematic random sampling was used. The first 229 non-first generation respondents were systematically selected from the sampling frame by selecting the first respondent from the group and then selecting every other respondent from the larger group of 483 non-first generation respondents. Systematic random sampling is a means of assuring that any unit in a given population has an equal chance of being selected for inclusion in the final sample by selecting the first student in the group and then selecting every *n*th student thereafter (Agresti & Finlay, 2009). Beginning with the first respondent in the non- first generation group, every other respondent listed in the sample was selected for the final comparison group of 229 non-first generation students.

Demographics

The population of this institution is comprised of 6.53% African-Americans or Black students; 6.07% Asian American/Pacific Island; 4.51% Hispanic; 74.45% Caucasian (non-Hispanic); 3.52% were two or more races (unspecified); and 1.74% were selected “unknown” as their racial identity. The institution is comprised of 44.22% females and 55.78% male. The research literature consistently reflects that first generation females outnumber first generation males in college enrollment across the nation regardless of the type of institution (Choy, 2005; Hicks, 2003).

The student body at the study university is comprised of 22.03% freshmen; 20.38% sophomores; 25.43% juniors; 32.06% seniors. The author made an intentional effort to exclude first year students from this study because the research well reflects that first-year students have limited knowledge about and experience with majors and career decisions (Cuseo, 2005; Gordon, 2007).

Instrumentation

Career decision-making self-efficacy scale. The Career Decision Self-Efficacy Scale (CDSE) (Taylor & Betz, 1983) measures a person’s confidence in his/her ability to successfully complete career decisions and related tasks. The CDSE was developed based on Crites (1978) five Career Choice Competencies and includes subscales labeled as follows: 1) accurate self-appraisal; 2) gathering occupational information; 3) goal selection; 4) making plans for the future; and 5) problem solving (Betz & Taylor, 2012). Each competency category contains 10 items totaling a 50- item questionnaire. The instrument is also accompanied by a scoring key for each subscale. The first form of the questionnaire asks respondents to rate their ability to successfully complete a list of career decision related tasks. Responses were rated on a 10-point scale that ranges from 0 (*No Confidence*) to 9 (*Complete Confidence)*. Items means could range from 0 to 9 (Betz & Taylor, 2012). In the research to validate the original form of the questionnaire, the internal consistency reliability coefficients range from .86 to .89 for the subscales and .97 for the total score (Taylor & Betz, 1983). A total scale alpha of .93 was reported (Taylor & Betz, 1983).

In 1996 a short form containing 25 items was developed. The internal consistency reliability coefficients for the short form ranged from .73 (self-appraisal); .78 (occupational information); .83 (goal selection); .81 (planning); and .75 (problem solving) (Taylor & Betz, 1983). It was shortened and designed for easier use in counseling sessions as a pre- and post-assessment for career counseling interventions (Betz & Taylor, 2012). According to the authors the original instrument was shortened by eliminating five items from each of the 10-item scales. The short form now consists of five scales of five items in each scale and responses range from 1 (*No Confidence at All)* to 10 (*Complete Confidence)* (Betz & Taylor, 2012). While both the short form and the long form of the CDSE have proven to be highly reliable, the total alpha for the short form is reported to be .95. Betz, Hammond, and Multon (2005) confirm the high reliability of both forms and reported 10-level response continuum scores to be .78 to .85 with a sample of 400 students and .80 to .84 with a sample of more than 600 students. The students in this study were predominantly White; however, Chaney, Hammond, Betz, and Multon (2007) found similar results surveying 220 African American students. They report alphas of .78 (problem solving) to .85 (goal selection) for the CDSE--SF using the five-level response continuum. The six-week test-retest reliability of the CDSE was reported to be .83 (Betz & Taylor, 2012).

The evidence to support the content validity of the CDSE is conflicted. Some researchers have found no evidence to support the existence of five subscales and suggest that the CDSE--SF is best used as a generalized career self-efficacy measure (Taylor & Popma, 1990). However, Gati (1994) found that when items based on low item-scale correlations or high correlations with other scales were eliminated, the five factor structure of the CDSE was validated. Still other more recent researchers contend that factor analysis methodology has evolved and some of the older studies are based on faulty methodology (Miller, Serndrowitz, Brown, Thomas, & McDaniel (2009). They have found that using confirmatory factor analysis supports the validity of a five factor structure. They believe that confirmatory factor analysis is best used to validate the structure given its sound theoretical grounding in Crite's (1978) Career Choice Model. Lo Presti, Pace, Mondo, Nota, Casarubia, Ferrari, and Betz (2013) surveyed 3,390 Italian students and found additional support for the five factor model. Studies that used samples that varied in ethnicity and nationality seemed to support the five factor structure more than earlier studies with more homogenous samples (Betz & Taylor, 2012).

The construct validity of the CDSE--SF varied depending upon its relationship with other variables related to educational and career goals (Betz & Taylor, 2012). The variable that was most consistently correlated with career decision-making self-efficacy was career indecision. Taylor & Betz (1983) found the correlation of the CDSE with career indecision subscale ranged from -.29 (problem solving) to .48 (goal selection). Robbins (1985) found the correlation between career indecision and CDSE to range from -.18 (occupational information) to -.40 (planning). Several other researchers confirm the strong relationship between career decision-making self-efficacy and career indecision. According to Betz & Taylor (2012) all of the relationships found were statistically significant. The relationship between career indecision and the short form of the CDSE were even stronger than in the original long form of the instrument (Betz, Klein, & Taylor, 1996).

The CDSE is also related to vocational identity (Betz et al., 1996); career beliefs (Luzzo, 1999); fear of commitment (Serling & Betz , 1993); career exploration behavior (Gianakos, 1999); career adjustment (Taylor & Popma, 1990); and academic and social integration (Peterson, 1993); healthy personality (Niles & Sowa, 1992); math self-efficacy (Betz &Klein, 1996); generalized self-efficacy (Betz & Klein, 1996); global self-esteem (Robbins, 1985); higher age and higher grades (Peterson, 1993); and efficacy and outcomes expectations (Lent, Brown, & Hackett, 2000).

The CDSE has been adapted for use with middle school, high school, and college students (Betz & Taylor, 2012). The CDSE--SF is developed on an eighth grade reading level and is expected to take about 10 minutes to complete. The instrument is available in English and Hebrew versions. Betz and Taylor (2012) designed the tool for use as a career counseling intervention. They suggest a pre- and post- intervention administration of the tool to assess changes in confidence level in career decision-making.

Demographic survey. A demographic survey was created for the purposes of this study. The survey contained nine questions that ask participants about their age, gender, race, GPA, total number of credit hours completed, their mother's and father's educational level, the major and college in which they are enrolled, educational goals, and which career decision-making support programs and/or personnel they have used to inform their selection of a major. The purpose of the demographic data was to sort out the sample into two groups of students--one group that is first generation college students and another group that is not first generation. Additionally, the demographic data provided additional information that is relevant to the study based on the literature review and offered additional breadth to the data analysis about group differences in major-changing behavior.

Data Collection

Permission to use and administer the Career Decision Self-Efficacy Scale--Short Form (CDSE--SF) and permission to extract the students' GPAs and total number of major changes from the University's Office of Enrollment Management and Services were obtained from NC State University's Institutional Review Board (IRB). Quantitative data were collected using the Career Decision Self-Efficacy Scale--Short Form (CDSE--SF). Students also self-reported their number of major changes and grade point average in the demographic survey. The CDSE--SF was administered electronically to all students who had accrued at least 30 credit hours. One student with less than 30 credit hours discovered the survey and took it as well.

Procedures. A two-group comparison design using a convenience sample was collected from the institution in which the researcher is employed was used. The researcher contacted the Office of Enrollment Management and Services to request the email addresses and student identification numbers of all students who had accrued at least 30 credit hours.

The Office of Enrollment Management and Services also identified whether or not the student was first generation status. Students' emails and identification numbers were sorted into two groups based on their parental level of education (first generation college status). The student identification numbers were numerically coded for data analysis. The first group was comprised of first generation college students and the comparison group was comprised of non-first generation college students. The researcher's goal was to identify a sample of at least 200 students per group (non-first generation and first generation).

The students were sent an email that explained the details of the study. The email explained the purpose of the study, assured participants of confidentiality, and contained a link to the informed consent, demographic sheet, and the CDSE--SF scale. Students who completed the informed consent and the demographic sheet were directed to a web address to access the online survey. The survey was purchased from Mind Garden Incorporated and distributed through its online portal at www.mindgarden.com. Mind Garden Incorporated computed the scale and subscale scores from the completed survey.

Students were told that they should print a copy of the informed consent if they desired a copy for their personal file. Survey results were submitted to www.mindgarden.com for preliminary analysis. The results of the demographic survey were compiled and returned to the researcher. The initial data files received from Office of Institutional Research and Planning (OIRP) and the Office of Enrollment Management and Services (OEMS) were stored for confidentiality and data analysis. The data files and survey results were stored in a secure electronic file that is only accessible to the researcher by password. A second administration of the survey was conducted to increase the sample size for a more reliable comparison of the two groups of students.

Data Analysis

Dependent variables. The dependent variables were the CDSE-SF subscale scores and the item-level scores.

Independent variables. The independent variables for this study were first-generation college students and non- first generation college students. Each participant was asked to complete the Demographic Survey. Information regarding the independent variables and demographic variables was taken from the Demographic Survey and compared to the self-reported variables for accuracy. Respondents were asked to report age in the following categories: 17 or younger = a; 18-24 = b; and 25 or older = c. Students were also asked to indicate whether they were female or male. Respondents' race was coded as follows: African American=a; Asian=b; Hispanic=c; Caucasian (other than Hispanic)=d; Multi-racial=e; and other=f.

Grade point averages, college of enrollment, and total number of credit hours were solicited from the Office of Enrollment Management and Services along with other student data. Classification was not requested from students as it can be determined by the number of credit hours that a student has accrued. Participants were asked to indicate if they received formal career development support or advising to help them select their major. They were given the following list of support services to choose from: your academic advisor, faculty in your college other than your advisor, Career Development Center, Walk-in Advising Services, First Year College (now known Exploratory Studies), Student Support Services in

TRIO, Academic Coach, Academic Advising Services Intracampus Transfer Services (ICT), and other. To conclude the survey the students were asked to indicate their post-graduation career plans. Students were provided the following options from which to select: Graduate school = a; Get a job in your field of study = b; Get a job somewhere = c; Go to the military = d; and an option to identify other plans that are not listed = e.

To answer the first question, a two-way Analysis of Variance (ANOVA) was used to determine if there were statistically significant differences in levels of the career decision-making self-efficacy scale scores between first-generation and non-first generation college students. To control for developmental differences that might impact the CDSE--SF scores, students were categorized into three developmental groups by classification (as indicated by number of completed credit hours).

The survey instrument (CDSE--SF) has five different subscales which are accurate self-appraisal, gathering occupational information, goal selection, making plans for the future, and problem solving. Each subscale score used was the dependent variable. The independent variable is FGCS status 1 = yes and 0 = not FGCS. Mind Garden Incorporated computed the composite and subscale scores as a part of the service it provided in the survey administration.

To answer question two, a one-way ANOVA was used to determine if there was a statistically significant difference in the GPA of FGCS students who did not change majors and those who changed majors at least once. For the purposes of this study a major change was considered a change from a student's initially declared major to a second declared major. Major 1 would be the student's declared major upon admission to college. A change from undecided or undeclared status to declared status was not considered a major change. The dependent variable in this question is the GPA and the two independent variables are no major change = M0 and changed majors at least once = M1.

To answer question three, a one-way ANOVA was computed to determine if there was a statistically significant difference in the levels of career decision-making self-efficacy scores between first-generation college students who did not change majors and those who changed majors at least once. The dependent variable in this question was the CDSE--SF subscales and the independent variables were no major change = M0 and changed majors at least once = M1. Major change data was also requested from the OEMS was identified by changing program (or curriculum) codes.

Limitations

The scope and generalizability of this study was limited by several factors. While the term first generation college student is defined as a student whose parents did not graduate from a post-secondary institution, there is quite a bit of diversity across that category of students. This diversity was not accommodated in the study and the results of the study may not be generalized across all first generation students. Additional research is needed to determine if the impact varies by subgroups of students within the first generation category.

The sample for the study was drawn from one university that is quite selective as measured by Scholastic Aptitude Test (SAT) scores and high school grade point average. However, a plethora of research exists that shows FGCS tend to score lower on the SAT (Chen, 2005; Ishitani, 2003). Therefore, FGCS are better represented in other types of institutions such as community colleges, Historically Black Colleges and Universities

(HBCUs), and less selective institutions. Hence, it is recommended that a similar study of FGCS be conducted at a broader range of institutions that enroll larger numbers of FGCS. This study analyzed differences based on a composite CDSE – SF scale score and subscale scores. The analysis of subscale data provided additional insights about how specific areas of career decision-making might be impacted across first generation student groups.

While the utilization of a convenience sample provided easy, inexpensive, and quick access to participants, this type of sampling may introduce bias into the study. A major criticism of convenience sampling is that it does not generally yield a sample that is representative of the entire population of participants (Patton, 1990). Thus, any results found may not be generalizable to the entire population. Patton (1990) advises researchers to explain how their sample may differ from the ideal sample, to describe which participants may be under- or over-represented in the study, and to describe the possible effects that the over- or under-representation might have on the study.

Chapter 4

Results

The primary purpose of this study was to determine differences in career decision-making self-efficacy and major changing patterns between first generation college students and college students who are not first generation. The secondary purpose was to determine how changing majors impacts a student's career decision-making self-efficacy and academic performance (as measured by grade point average) in college. This study will focus on the following research questions: 1) What are the differences in career decision-making self-efficacy scores between first-generation college students and non-first generation college students? 2) What are the differences in the GPA of FGCS who changed their major and those who did not change their majors? 3) What are the differences in the levels of career decision-making self-efficacy scores between first-generation college students who changed their major at least once and first generation students who did not change their major?

Sample

The sample consisted of 821 students enrolled at a large predominantly White university in the southeastern United States. Some 102 of the 821 responses were excluded because respondents did not complete the CDSE--SF. There were 719 remaining respondents who completed both the demographic survey and the CDSE--SF. A total of 229 of the 719 respondents indicated that they were first generation college students, while seven indicated that they were unsure of their first generation status. There were 483 respondents remaining who indicated they were non-first generation students.

The respondents were then split into two groups for analysis. One group was first generation students and the other group was non-first generation students. To reduce the chance for possible sampling bias and to create similar-sized comparison groups for data analysis, systematic random sampling was used. The first 229 non-first generation respondents were systematically selected from the sampling frame by selecting the first respondent from the group and then selecting every other respondent from the larger group of 483 non-first generation respondents. Systematic random sampling is a means of assuring that any unit in a given population has an equal chance of being selected for inclusion in the final sample by selecting the first student in the group and then selecting every *n*th student thereafter (Agresti & Finlay, 2009). Beginning with the first respondent in the non- first generation group, every other respondent listed in the sample was selected for the final comparison group of 229 non-first generation students.

Demographics

As seen in Table 4.1 below, 458 students were included in the final sample, 229 (50.0%) were first generation and 229 (50.0%) were non-first generation. Some 270 (59.0%) of the participants were female and 188 (41.0%) were male. The sample was comprised of 46 (10%) African-American or Black; 23 (5%) Asian; 19 (4.1%) Hispanic; 343 (74.9%) Caucasian (non-Hispanic); 17 (3.7%) Multi-racial; and 10 (2.2%) of the students selected “Other”.

The ethnic demographics of this study are similar by proportion to the demographics of the university where the study was conducted. The population of this institution is comprised of 6.53% African-Americans or Black students; 6.07% Asian American/Pacific

Island; 4.51% Hispanic; 74.45% Caucasian (non-Hispanic); 3.52% were two or more races (unspecified); and 1.74% were selected “unknown” as their racial identity. However, the gender demographics of this sample were not consistent with the gender representation at the institution or that reflected in the research literature. The institution is comprised of 44.22% females and 55.78% male. The research literature consistently reflects that first generation females outnumber first generation males in college enrollment across the nation regardless of the type of institution (Choy, 2005; Hicks, 2003). Some of the variance in gender representation might be attributed to the institution’s STEM focus. Generally, males outnumber females in STEM fields (Hill, Corbett, & St. Rose, 2010).

The student body at the study university is comprised of 22.03% freshmen; 20.38% sophomores; 25.43% juniors; 32.06% seniors; and .093% of the students had been enrolled for five or more years. There was only one student who was a first year student with less than 30 credit hours. Table 4.3 also shows that 36.7% of the participants were sophomores; 21.2% were juniors; and 42.1% were seniors. The author made an intentional effort to exclude first year students from this study because the research well reflects that first-year students have limited knowledge about and experience with majors and career decisions (Cuseo, 2005; Gordon, 2007). As seen in Table 4.1, more students of color are represented in first-generation college students than non-first generation college students. This finding is consistent with other studies in the research literature whose research results show that students of color are overrepresented in the first generation college student population (Bullock-Yowell, Andrews, & Buzzetta, 2011; Choy, 2005; Hicks, 2003;).

Table 4.1
Demographic Summary of the Sample

Variable Comparison	First Generation	Non-First Generation
Females	61.6%	56.3%
Males	38.4%	43.7%
African-Americans	13.1%	7.0%
Asian	4.8%	5.2%
Caucasian	68.6%	81.2%
Hispanic	4.8%	3.5%
Multiracial	6.1%	1.3%
Other	7.4%	1.8%

Notes: First generation college students $n = 229$

Non-first generation college students $n = 229$

Table 4.2 shows the participants' educational or career plans following college for the sample of 458 students. Some 240 (52.4%) of the students indicated that they planned to secure a job in their field of study; 152 (32.8%) reported that they intended to attend graduate school upon graduation; 29 (6.3%) of the respondents reported that they had plans to do something other than the options specified on the demographic survey; 29 (6.3%) planned to get a job somewhere; and 8 (1.8%) reported that they planned to go into the military following their completion of college.

Table 4.2
Educational and Career Plans Following College

Plan	Frequency	Percent	Cum. Percent
Find job in their field	240	52.4%	52.4%
Attend graduate school	152	33.2%	85.6%
Find a job somewhere	29	6.3%	91.9%
Other	29	6.3%	98.2%
Go into the military	8	1.8%	100.0%

As seen in Table 4.3, some 394 (86%) of the students in the sample reported that they had accrued more than 60 credit hours. Table 4.3 also indicates that 88.6% of the first generation students and 83.4% of the non-first generation students had more than 60 credit hours. This finding is inconsistent with the research literature which reflects that first generation students tend to lag behind their non-first generation peers in the number of credits earned.

Table 4.3
Total Number of Credit Hours Completed by Student Status

Credit Hour Range	First Generation	Non-First Generation
	Percent (Frequency)	Percent (Frequency
< 30	0.0% (0)	0.4% (1)
30-44	3.1% (7)	2.2% (5)
45-59	8.3% (19)	14.0% (32)
60-74	20.1% (46)	25.3% (58)
75-89	19.7% (45)	22.7% (52)
< 90	48.8% (112)	35.4% (229)
	100.0 (229)	100.0 (229)

Quantitative Analysis

The data for the research questions were analyzed using descriptive and inferential statistics based upon the subscales of the Career Decision Self-Efficacy Scale – Short Form (CDSE--SF) with a sample size of set at n = 229 for the first-generation college student group and n = 229 for the non-first generation college student group. Data analysis was conducted on the mean scores and frequency distribution responses for the first-generation and other college student groups using the Statistical Package for the Social Sciences (SPSS), Version 19.0 to find out if there were significant differences in each of the dependent variables. A one-way ANOVA was used to determine the differences between first-generation and other college students' scores on the CDSE--SF and their grade point average. Additionally, an

ANOVA was used to examine the differences in the career decision-making self-efficacy as the number of major changes increased. This chapter examines the quantitative data that were gathered with the CDSE--SF, the demographic questionnaire, and the major change dataset.

Differences in career decision-making self-efficacy. The CDSE--SF was used to measure the career decision-making self-efficacy of the students. The survey instrument (CDSE--SF) has five different scales which are accurate self-appraisal, gathering occupational information, goal selection, making plans for the future, and problem solving. Each scale score used was the dependent variable. The independent variable was FGCS status (1= yes FGCS; 0 = not FGCS). Mind Garden Incorporated computed the composite and subscale scores as a part of the service they provided in the survey administration. Table 4.4 reflects the results of the comparison of the self-efficacy scale scores for first generation students and non-first generation students. While there were small differences in the mean scores of the two groups, none of the differences in mean CDSE--SF scale scores were statistically significant. Students who were not first generation scored higher on each scale, except the Planning scale.

Table 4.4
Means and Standard Deviations for CDSE--SF Score for First Generation College Students and Non-First Generation College Students

CDSE--SF Scale Item	First Gen.	Non-First Gen.	*p*-value
	M (SD)	M (SD)	
Self-Appraisal	3.85 (0.604)	3.90 (0.681)	0.376
Occupational Information	4.07 (0.605)	4.08 (0.619)	0.819
Goal Selection	3.83 (0.654)	3.85 (0.713)	0.859
Planning	4.00 (0.612)	3.94 (0.667)	0.307
Problem Solving	3.79 (0.643)	3.82 (0.659)	0.556
Total Score	3.91 (0.532)	3.92 (0.581)	0.854

*Note: *significant at 0.05*

Each scale of the CDSE--SF is comprised of 5 subscales yielding a total of 25 items. Table 4-5 shows the results of a one-way ANOVA conducted to determine if any statistically significant differences existed between first generation students and other students in the 25 subscale items.

The comparison of the 25 item scores rendered that there were significant differences on two items in the Planning Scale Score by first generation and non-first generation college student status. As can be seen in Table 4.5, a one-way ANOVA comparing the mean scores of the first-generation and other college student groups found a statistically significant difference (F (1, 456)=.568, p = .019) between the means of the two groups for the item on the Planning Scale, "*Prepare a good resume.*" This analysis revealed that the mean score for the first-generation college students was significantly lower (*M* = 3.79, *SD* = .916) than the mean score of the non-first generation college students (*M* = 4.00, *SD* = .906).

Table 4.5 also reflects the results of the one-way ANOVA comparing the mean scores of the first-generation and non-first generation college student groups. A statistically significant difference ($F(1, 456)=4.383$, $p = .037$) was found between the means of the two groups for the item on the Planning Scale, "*Successfully manage the job interview process*." This analysis revealed that the mean score for the first-generation college students was significantly lower (*M* = 3.65, *SD* =1.001) than the mean score for non-first generations students (*M*=3.83. SD=.917).

Table 4.5

CDSE--SF Item Level (Subscale) Scores of First Generation and Non-First Generation Differences

CDSE--SF Scale Item	First Gen	Non-FG	p-value
	M (SD)	M (SD)	
Use internet to find info. About occupations of interest	4.43 (.738)	4.40 (.735)	.657
Select one major from a list of potential majors you are considering	4.14 (.899)	4.17 (.840)	.707
Make a plan of your goals for the next five years	3.79 (1.037)	3.77 (.961)	.779
Determine steps to take if you are having academic trouble with major	3.83 (.928)	3.83 (.920)	.960
Accurately assess your abilities	3.78 (.846)	3.84 (.823)	.433
Select one occupation from a list of potential occupations you are con	3.90 (.890)	3.78(.857)	.135
Determine the steps you need to take to successfully complete your major	4.37 (.798)	4.31(.775)	.440
Persistently work at your major or career goal even when you get frustrated	4.28 (.865)	4.16(.851)	.128
Determine what your ideal job would be	3.72 (1.067)	3.65(.932)	.428
Find out the employment trends for an occupation in the next decade	3.43 (1.068)	3.47 (1.074)	.663
Choose a career that will fit your preferred lifestyle	3.83(.968)	3.82(.928)	.844
Prepare a good resume	3.79(.916)	4.00(.906)	.019*
Change majors if you did not like your first choice	3.68(1.124)	3.72(1.131)	.649
Decide what you value most in an occupation	4.04(.897)	3.97(.840)	.361
Find out the average yearly earnings of people in an occupation	4.28(.837)	4.24(.821)	.652
Make a career decision and then not worry about whether it is right or	3.18(1.051)	3.19(.980)	.927
Change occupations if you are not satisfied with the one you enter	3.54(.924)	3.47(.944)	.396
Figure out what you are and are not ready to sacrifice to achieve career goals	3.76(.968)	3.64(.900)	.178
Talk to a person already employed in a field you are interested in	4.19(.936)	4.22(.783)	.705
Choose a major or career that will fit your interests	4.17(.849)	4.21(.829)	.578
Identify employers, firms, institutions relevant to your career possibilities	3.78(.926)	3.75(.886)	.757
Define the type of lifestyle you would like to live	4.21(.829)	4.15(.805)	.424
Find information about graduate professional schools	4.07(.950)	4.00(.884)	.387
Successfully manage the job interview process	3.65(1.001)	3.83(.917)	.037*
Identify some reasonable major and career alternatives if you can't get	4.08(.929)	4.08(.829)	1.000

Students were separated into three groups by number of credit hours completed to control for any developmental differences between the groups that might impact the results of the analysis. Within each of the three developmental groups first generation student scores on the CDSE--SF were compared to non-first generation student scores. The first group included 64 students with fewer than 60 (first year and sophomore students) credit hours. It is important to note here that there was only one student participant who had less than 30 credit hours. There were 26 first generation students and 38 non-first generation students in Group 1. Group 2 was comprised of students who had accrued between 60-89 credit hours (juniors) which included 91 first generation students and 110 non-first generation students. Group 3 was comprised of students who had completed at least 90 credit hours (seniors) and included 112 first generation students and 81 non-first generation students.

As can be seen in Table 4.6, the results of a one-way ANOVA comparing the mean scores of the 64 students in Group 1 showed that there was a statistically significant difference ($F (1, 60) = 4.197$, $p = .045$) between the two groups on the Planning scale item, "*Summarize the skills you have developed in the jobs you have held*". This analysis revealed that the mean score for the first-generation college students was significantly lower (M = 3.44, SD = .961) than the mean score of the non-first generation college students (M = 3.92, SD = .862). This analysis is consistent with other research results that indicate first generation students have limited understanding of how their college experience relates to their experiences once they leave college (Palmer & Gasman, 2008; Parks-Yancey, 2012;

Royster, 2003). Parks-Yancey (2012) also found that first generation students often limit their career options due to this lack of job knowledge.

Table 4.6

Means and Standard Deviations for CDSE--SF Score for First Generation College Students and Non-First Generation College Students (Group 1)

CDSE--SF Item	First Gen	Non-FG	*p*-value
	M (SD)	M (SD)	
Select one occupation from a list of potential occupations you are considering	4.5 (.762)	4.42 (.683)	.198
Determine the steps you need to take to successfully complete your major	4.12 (1.071)	4.11 (.764)	.965
Talk to a person already employed in a field you are interested in	3.96 (1.113)	4.08 (.712)	.608
Summarize the skills you have developed in the jobs you have had	3.44 (.961)	3.92 (.862)	.045*
Find information about graduate professional schools	3.88 (1.03)	3.89 (.764)	.964
Successfully manage the job interview process	3.58 (1.270)	3.82 (.766)	.352

*Note: *significant at .05*

Table 4.7 shows the results of the one-way ANOVA comparing the mean scores of the 201 students in Group 2. There were no significant differences on the CDSE--SF scale items between the first-generation and non-first generation college students in Group 2.

Table 4.7

Means and Standard Deviations for CDSE--SF Score for First Generation College Students and Non-First Generation College Students (Group 2)

CDSE--SF Item	FG	Non-FG	*p*-value
	M (SD)	M (SD)	
Successfully manage the job interview	3.57 (.944)	3.81 (.972)	.082
Select one major from a list of potential majors you are considering	4.11 (.849)	4.18 (.826)	.545
Make a plan of your goals for the next five years	3.74 (1.052)	3.85 (.897)	.391
Determine steps to take if you are having academic trouble with major	3.70 (.960)	3.85 (.897)	.807
Accurately assess your abilities	3.68 (.787)	3.79 (.836)	.343
Prepare a good resume.	3.75 (.838)	3.97 (.943)	.078

*Note: *significant at .05*

Table 4.8 reflects the results of the one-way ANOVA comparing the mean CDSE--SF scores of the 193 students in Group 3. The results indicated a statistically significant difference (F (1, 191) = .437, p = .045) between the mean CDSE--SF scores of first generation college students and non-first generation college students for the Planning scale item, "*Prepare a good resume*." This analysis revealed that the mean score for the first-generation college students was significantly lower (M = 3.88, SD = .921) than the mean score of the non-first generation college students (M = 4.14, SD =.833).

Table 4.8

Means and Standard Deviations for CDSE--SF Score for First Generation College Students and Non-First Generation College Students (Group 3)

CDSE--SF Item	FG	Non-FG	*p*-value
	M (SD)	M (SD)	
Successfully manage the job interview process	3.72 (.979)	3.88 (.914)	.271
Select one major from a list of potential majors you are considering	4.20 (.919)	4.23 (.884)	.733
Make a plan of your goals for the next five years	3.87 (1.009)	3.72 (1.003)	.308
Determine steps to take if you are having academic trouble with major	3.94 (.852)	3.95 (.879)	.917
Accurately assess your abilities	3.91 (.823)	3.86 (.862)	.704
Prepare a good resume	3.88 (.921)	4.14 (.833)	.045*

*Note: *significant at .05*

GPA of first generation college students who changed their major status. Table 4.9 shows the frequency of major changes for the first generation and non- first generation college students. In reviewing the participants' numbers of major changes for the first generation group of students, the data revealed that 139 (60.7%) of the students had not changed majors. Ninety (39.3%) of first generation students reported that they had changed majors at least once. There were no first generation students represented in the sample who had changed majors more than twice.

Table 4.10 reflects the results of an independent samples t-test showing a statistically significant difference (t (221) = 2.233, *p*, *<.05*) between the mean GPA of the two groups. A comparison of the mean GPAs of the first generation students who changed their majors to those who did not change their major showed that the students who did not change their major had a significantly higher GPA (*M* = 3.25, *SD* = .449) than the first-generation college students who did change their major at least one time (*M* = 3.10, *SD* = .536).

Table 4.9
Number of Major Changes for First Generation Students

No. of major changes	Frequency	Percent
0	139	60.7
1	69	30.1
2	21	9.2
Total	229	100.0

Table 4.10
Levine's Test for Equality of Variance (Independent Samples t-test) Result

	Sig. t-value	df	Sig.(2-tailed)	*p*-value
Equal variances assumed	.053	2.233	221	.027
Equal variances not assumed		2.159	168.172	.032

Table 4.11
Differences in GPA for First Generation Students Who Changed Majors and First Generation Students Who Did Not Change Majors

Major Change Status	N	M	SD	SEM
No major change	133	3.25153	.449249	.038955
Yes major change	90	3.10340	.535756	.056474

Impact of major changing on career decision-making self-efficacy. As reflected in Table 4.12 the results of a one-way ANOVA comparing the mean CDSE--SF scores of the first-generation students who did not change their major and those who did change their major at least one time did not render any statistically significant differences. However, a meaningful difference was found ($F (1, 227) = 1.092$, $p > .05$) between the means of the two groups for the self-appraisal item, "*Decide what you value most in an occupation.*" The analysis revealed that the mean score for first-generation college students who did not change their major was higher ($M=4.09$, $SD = .900$) than the mean score of the first generation college students ($M=3.97$, $SD = .893$) who changed their major at least one time. First generation college students who didn't change their major felt a higher level of confidence in their ability to decide what they valued most in an occupation than did first generation students who changed their major at least one time.

Table 4.12
Means and Standard Deviation for CDSE--SF Score for Students who Changed Majors and Those Who Did Not Change Majors

CDSE—SF Item	No Change	Yes Change	*p*-value
	M (SD)	M (SD)	
Determine steps to take if you are having academic trouble with major	3.83(.928)	3.83(.920)	.089
Accurately assess your abilities	3.78 (.868)	379(.814)	.917
Determine what your ideal job would be	3.69(1.062)	3.78(1.079)	.547
Prepare a good resume	3.73(.913)	3.89(.917)	.212
Successfully manage the job interview process	3.55(1.072)	3.80(.864)	.061
Decide what you value most in an occupation	4.09(.900)	3.97(.893)	.297

*Note: * significant at .05*

In summary, the study revealed that there is a statistically significant difference (F (1, 60) = 4.197, p = .045) between first generation college students and non-first generation college students with less than 60 credit hours on the CDSE--SF subscale item, "*Summarize the skills you have developed in the jobs you have held*". This analysis revealed that the mean score for the first-generation college students was significantly lower (*M* = 3.44, *SD* = .961) than the mean score of the non-first generation college students (*M* = 3.92, *SD* = .862). No significant differences were found in career decision- making self-efficacy item scores for students with between 60-90 (juniors) credit hours. However, there was a statistically significant difference (*F* (1, 191) = .437, *p* = .045) in career decision-making self-efficacy item scores between first generation college students and non-first generation college students with 90 or more credit hours on the CDSE--SF item, "*Prepare a good resume*". The mean score for the first-generation college students was significantly lower (*M* = 3.83, *SD* =

1.039) than the mean score of the non-first generation college students (*M* = 3.88, *SD* =1.166).

Chapter 5

Discussion

The purpose of this study was to explore differences in career decision-making self-efficacy between first generation college students and non-first generation students, and to determine if changing majors might impact the career decision-making self-efficacy and academic performance of first generation college students. The academic performance measure used was the student's grade point average. The Career Decision-making Self-efficacy-Short Form (CDSE--SF) was utilized to assess career decision-making self-efficacy in the students. This chapter includes a summary of the findings for each research question, a discussion of the results and their implications for future research and practice, and a discussion of the limitations of the study. In conducting the study, a plethora of research was found that addresses career decision-making self-efficacy in undecided students. However, there was a lack of research that addressed career decision-making in those students who were redeciding a major choice. Recommendations will be given for future research that might broaden the knowledgebase around career development for first generation students, particularly redeciding first generation students.

The study addressed three research questions: a) what are the differences in career decision-making self-efficacy scores between first-generation college students and non-first generation college students? b) What are the differences in the GPA between first generation college students who changed their major and those who did not change their majors? and c) What are the differences in the levels of career decision-making self-efficacy scores between first-generation college students who changed their major at least once and first generation students who did not change their major at all?

Differences in Levels of Career Decision-Making Self-Efficacy Scale Scores

A one-way ANOVA comparing the mean CDSE-SF scores on the five scales of the CDSE-SF for first-generation and non-first generation college student groups rendered that there are no statistically significant differences between the means. This analysis revealed that, although not significant, the mean scores for first-generation college students were lower on all of the five scales except for the Planning Scale. On the Planning Scale FGCS scored higher than students who were not first generation. This finding was unexpected and inconsistent with the research literature that has consistently reflected that first generation students need more support than other students when both making career decisions and planning their careers.

Collier and Morgan (2008) highlight the difference between first generation college students and non-first generation college students in the manner in which they have been socialized to engage with careers and work. Other studies show that first generation college students lack the necessary career capital and college knowledge because they are less likely to have parents, peers, and/or mentors who can help them understand how to apply higher education experience to obtain a career goal (Lareau, 2003; Morgan, 2008, Palmer & Gasman, 2008; Parks-Yancey, 2012).

Limited access to career resources. According to past research first generation college students often lack knowledge about careers, in general, and do not realize what information and networks they need to make a successful transition into a career once they leave college (Kim & Sax, 2009; Parks-Yancey, 2012; Vargas, 2004). For this reason first generation college students often continue to work in the jobs they held during college after they graduate whether that job is related to their chosen major or not (Collier & Morgan, 2008; Lareau, 2003).

This tendency to remain in jobs unrelated to their major after completing college could also be related to FGCS limited ability to summarize and translate their skills to different kinds of work experiences. College students who have parents with careers have a broader understanding of careers, and have parental assistance to navigate the transition from college to career. They also have additional support to build the networks needed to be successful. First generation students do not have access to mentors and role models who can help them build the cultural capital and human resources that they need to better understand the world of work (Pascarella, et al., 2004).

Findings by Brown and Hesketh (2004) were also aligned with the research finding that first generation students have lower ability than non-first generation students to summarize the skills they have gained from other work experiences. These authors emphasized the need for students in today's knowledge-based economy to have the ability to market their cumulative personal skills.

Robst (2007) supported the notion further when reporting that low socioeconomic status students are more likely to select "safe" majors in college than they are to choose majors that require very specific skillsets. He stated that the consequence of making safe decisions about a major is that safe majors lead to jobs that are more subject to economic market trends than those that require a more general skillset. This might explain why first generation students, particularly those from low income families, tend to have lower incomes upon completion of college than non- first generation students (Nunez & Cuccaro-Alamin, 1998).

Parental influence. Other related studies highlight the importance of family influence on the career development process (Fouad, et al., 2010; Robst, 2007; Whiston & Keller, 2004). Findings of these studies show that socioeconomic status perpetuates social stratification (Chen, 2005; Vargas, 2004). Because parents of first generation college students do not have experiences with higher education or college knowledge they are less likely to be able to advise their children effectively.

Parents are also less likely to be able to help their students relate personal experiences and job skills to the skills needed in a chosen career path (Parks-Yancey, 2012; Vargas, 2004). Parents of first generation students are also more likely to hold unrealistic expectations and aspirations about their child's future career. In this case, parents can negatively influence their children by pressuring them to pursue fields of study and careers that are a poor match for their personal skill sets and strengths (Ishitani, 2003). First generation students often experience heightened sadness and anxiety in college in efforts to meet the unrealistic expectations about a major that their parents hold. According to Hartig and Steigerwald (2007) these feelings can be attributed to the parents' lack of understanding about the student's experience in the college environment.

More recent research regarding parental support for first generation students suggests that there is a trend toward these students feeling more supported by their parents, particularly as it relates to college entry and graduation (Smith, 2012). One might deduce, then, that as the number of first generation students attending college has increased, students and parents are growing more educated about the college process and increasing their college knowledge.

Another explanation might be that parents of first generation students provide a different type of support than do those parents who have attended college. Smith (2012) identifies three different types of parents of first generation students which are the "hand holder", "the unavailable parent", and the "happy medium". The *hand holder parent* wants their child to succeed so desperately that they make every decision for their child. The *unavailable parent* is either physically or emotionally unavailable to them. The *happy medium parent* provides the perfect balance of support and challenge. More research is needed to explore parental support and how it is perceived by researchers, administrators, students, and other groups.

Also, there is so much diversity within the first generation college student group that there may be within group variation by ethnicity, culture, income, etc. The research is clear that low income students have different experiences in college than higher income students. There is also evidence that African American and Hispanic students experience college and identify challenges that are much different than White students and Asian students. (Ishitani, 2003; Anglin & Wade, 2007). If colleges are to foster the success of all student groups there is much more information needed to describe the lived college experience by group.

Need for mentors. Having a strong network of professionals who can help students understand how their cumulative job skills, academic knowledge, and personal strengths might apply to future job and career opportunities is critical to first generation college student success. Nora and Crisp (2009) highlight the critical need for first generation students to have access to other mentors in addition to strong parental and family networks. Their research identified four critical roles that mentors serve for students which are: (a) help them set goals and choose a career path; (b) provide them with psychological and emotional support to accomplish career goals; (c) help them identify other role models and social networks that will be beneficial to building their careers; and (d) provide them with discipline-based knowledge and how it transfers to careers in their chosen fields of study.

It is well-documented that first generation students have limited access to role models and limited time to build connections with faculty and staff (Collier & Morgan, 2008; Lareau, 2003; Nora & Crisp, 2009). First generation college students are more likely to work and less likely to be engaged in campus activities because they work (Chen, 2005; Engle and Tinto, 2008). They need role models, faculty, and career professionals who can help them conceptualize how their existing experiences, skills, strengths, and abilities relate to their chosen career path. First generation students are less likely to participate in career development activities in college because they are more likely to work and tend to work more hours. This leaves them little time to participate in career development activities and build strong faculty and career transition networks (Collier & Morgan, 2008; Kim & Sax, 2009; Vargas, 2004).

Developmental Differences in CDSE-DF Item-level Scores Between First Generation and Non-first Generation Major-changers

In a closer review of the item-level scores the analysis showed that there was a statistically significant difference ($F(1, 60) = 4.197$, $p=.045$) between first generation college students and other students in the sample on the scale item, "*Summarize the skills you have developed in the jobs you have held.*" This difference is consistent with the results of past studies that show FGCS have different career development needs than other students (Parks-Yancey, 2012; Vargas, 2004). As we emphasized earlier they have limited access to professional mentors, family role models, and social capital required for them to make sound career decisions (Kim & Sax, 2009). While this seems quite consistent with the item-level analysis, cautious interpretation is warranted for two reasons. First, the validity of assessing related constructs (item-level scores) is questionable because it gives consideration to only one item of twenty five. Secondly, the use of many repeated statistical tests for 25 item level analysis increased the chance of Type I error.

When reviewing the impact of major change on the CDSE-SF scale scores, the results of a one-way ANOVA comparing the mean CDSE-SF scores of FGCS who did not change their major to those who did not change their major at least one time did not render any statistically significant differences. Although a meaningful difference was found ($F (1, 227) = 1.092$, $p>.05$) between the means of the two groups for the self-appraisal item, "Decide what you value most in an occupation." However, segmenting the group into developmental categories by number of credit hours that correlated with the students' college classification rendered that there were differences in CDSE-SF item level scores between the three developmental groups. Note that the three groups were less than 60 hours, 60-90 credit hours, and more than 90 credit hours.. When comparing FGCS with 90 or more credit hours, a statistically significant difference in CDSE-SF item "*Prepare a good resume*" was found between those who changed majors at least once and those who did not change majors at all.

The mean score for FGCS was significantly lower (*M* = 3.79, *SD* = .916) than the mean score for non-FGCS (*M* = 4.00, *SD* = .906).

A one-way ANOVA was also used to compare the means of the CDSE--SF item-level scores of the students who had accrued less than 60 credit hours. There were no significant differences on the CDSE--SF item level scores between the first-generation and not-first generation college students in students who had between 60-90 credit hours. But, in further comparison of the career decision-making self-efficacy between first generation college students and other students who had accrued at least 90 credit hours, a significant difference was found between the two groups for the item, "*Prepare a good resume*." Only one study was found that directly addressed resume preparation as it impacts career decision-making self-efficacy. That article was focused on the career decision-making self-efficacy in military veterans. Krieshok, Ulven, Hecox, and Wetterson (2000) found that career decision-making self-efficacy increased following a career counseling and resume preparation intervention. There were many studies in the literature that recommend resume preparation as a best practice for career development programming (Gore & Hunter, 2010; Makela & Rooney, 2014; Vargas, 2004).

It is also critically important to note in the results of this study that the longer a student remains in college the more likely their career decision-making self efficacy is to be impacted by the college experience. Additional attention needs to be focused on how the college experience, in and of itself, might or might not be impacting students.

Impact of Major Changes on Career Decision-Making Self-Efficacy

To explore how major changing impacts a student's career decision-making self-efficacy a comparison of the career decision-making self-efficacy of first generation college students who changed their majors at least one time was compared to first generation college students who did not change their major. There was no statistically significant difference found between the two groups. This finding implies that the career decision-making self-efficacy of first generation college students in this study was not impacted by changing majors. This finding is inconsistent with other research that shows that both entering college undecided and redeciding a major negatively impacts a student's career decision-making self-efficacy. Colleges need to understand if being undecided or redeciding a major might have a much different impact by student group.

Additionally, the impact of changing majors on career decision-making self-efficacy may be more related to the timing of a student's changes of majors than it is related to the act of changing majors. The research shows that students who change majors before accruing 45 credit hours tend not to delay completion. College completion is equated with academic success and academic success is positively correlated with career decision-making self-efficacy. Building college infrastructure that supports the process of changing majors and creating policies that make changing and/or declaring a seamless and transparent process would support the success of first generation students, as well as other students.

Career decision-making self-efficacy may be as impacted by the process of changing majors (how a student changes) as it is by when a student changes majors. It would be expected that a student's career decision-making self-efficacy would be negatively impacted if the student desired to switch into a major of choice but was unable to do so because of policy or academic competitiveness. This would be particularly true if the student had to select an alternate major to which they were less committed. Commitment to a major is positively correlated with career decision-making self-efficacy. This leads to the notion that selecting an alternate major might be negatively correlated with career decision-making self-efficacy; however, more research is needed with larger samples of students to explore further how the difficulty of major changing impacts career decision-making, particularly in first generation students.

Before the college experience and at the onset of the college experience first generation students and non- first generation students have similar levels of career decision-making self-efficacy (Harlowe, 2014). When career decision-making self-efficacy is assessed during the college experience, however, first generation students have lower career decision-making self-efficacy. This study further implies that the longer a student is in college the more likely their career decision-making self-efficacy is to be impacted. More studies need to be conducted to determine what exactly is negatively impacting the career decision-making self-efficacy of first generation students during college. The majority of the current research related to career decision-making self-efficacy in college focuses on pre-college characteristics and on the first year of college. Additional research is needed that focuses on how career decision-making self-efficacy is impacted by experiences during the student's time in college. The later in the college experience that a student makes a major change, the more likely that student is to lose credits and gain additional time to degree completion. This, also, emphasizes the importance of early career interventions in college.

Impact of Major-Changes on GPA

A comparison of the academic performance (as measured by grade point averages) of first generation college students who did not change their majors and those who did change their major resulted in a statistically significant difference t (221) = 2.233, $p < .05$) between the mean GPA of the two groups. This analysis revealed that the first-generation college students who did not change their major had a significantly higher GPA (M = 3.25, SD = .449) than the first-generation college students who did change their major at least one time (M = 3.10, SD = .536).

The previous research regarding the relationship between changing majors and academic performance is inconclusive and conflicted. Early research literature (before the mid-1980s) characterizes undecided students as being at risk and likely to underperform in college. But recent researchers have found that “decidedness” is negatively correlated with graduation from college (Cuseo, 2005; Graunke, et al, 2006; Lewallen, 1993; Micceri, 2002). Brown (2009) found that “non- specific majors” (students with undeclared major) actually out- performed “specific majors” (students with a declared major). More research is needed in order to reconcile these inconsistencies.

The research literature well-documents commitment to an academic major fosters academic success and that academic success enhances career decision-making self-efficacy (Tracey & Robbins, 2006). Since first generation students tend to be less successful than non-first generation college students and first generation students tend to enter college with limited information about majors and careers it is hypothesized that first generation college students would change majors more often. It was further hypothesized that if a first generation student changed majors the lower the student's grade point average would be. The research literature clearly reflects that non-first generation students tend to have higher grade point averages than do first generation college students (Chen & Carroll, 2005; Murphy & Hicks, 2006; Sawyer, 2008; Parks-Yancey, 2012). Because that result is so conclusive in past research it was not necessary to compare the grade point averages of first generation students to students in the sample who are not first generation. Even when the two cohort groups enter college with similar academic preparation first generation student grade point averages still lag behind non-first generation students throughout the college experience (Chen & Carroll, 2005; Pascarella, et al., 2004).

Career decision-making is the amount of confidence a student has in her or his ability to successfully complete career development tasks. It then seems logical that first generation students would have lower career decision-making self-efficacy scores than non-first generation students if they tend to have lower grades than non-first generation students. However, the research consistently reflects little, if any, difference in the career decision-making self-efficacy of the two groups. Most of this research has focused on pre-entry college students and first year college students. Aguayo, Herman, Ojeda, and Flores (2011) found that career decision self-efficacy and socioeconomic status predicted college completion of the first quarter for students who participated in their study. But the research does not give attention to what happens after the first quarter.

The results of an independent-samples *t*-test comparing the mean GPA of first generation college students who didn't change their major to that of first generation college students who did change their major revealed that the first generation college students who did not change their major had a significantly higher GPA (*M* = 3.25, *SD* = .449) than the first-generation college students who did change their major at least one time (*M* = 3.10, *SD* = .536). This finding is consistent with earlier research studies that show that self-efficacy beliefs of sophomores impacted their grade point average (Gore & Hunter, 2010; Vuong, Welty, & Tracz, 2010). These studies also showed that second generation sophomores had higher grade point averages and accrued more credit hours than their first generation peers (Choy, 2005; Vuong, Welty & Tracz, 2010).

These findings lead to further questions as to why there is a shift in academic performance for all students, but specifically for undecided and undeclared students between the first year and sophomore year in college. Shivpui, Schmitt, Oswald, & Kim (2006) found no evidence of research studies that focused on academic progress over time. They stated that high school grades, entrance test scores, and course rigor have been identified as accurate predictors of college success in the first year of college. However, these predictors were found to account for only 25% of the variance in college success over time. These researchers emphasized that most of the variance in college success is left unexplained.

According to Cuseo (2005), "the sophomore slump" evolved in the 1950s and is especially challenging for first generation sophomores. Marchese (1972) described a "cultural fog" that seemed to pervade students near the end of their first year. In his study students reported feeling burnt out, bored, caught between directions, and invisible. The students further responded that college grew a bit more difficult as they began to slack off. Feldman and Newcomb (1994) described a "sophomore slump" relative to student identity development. They also found that the second year of college presented personal and academic challenges that impacted the students' academic performance. Bailey and Karp (2003) stated that improving second year retention could have a greater overall impact on graduation rates than first year student retention efforts. He recommended that college administrators consider shifting some of the focus from first year retention efforts to second year (and beyond) retention initiatives. Because there is generally a year of transition before students grow to understand the college experience. More thought needs to be given to what exactly is happening in the second year that differently impacts students' academic success.

The finding that first generation students who did not change majors had higher grade point averages than those first generation students who changed majors warrants additional exploration. The finding may be unique to this sample of students which was heavily populated with upper-class students. There was only one student with less than 30 credit hours included in the sample. The students who changed majors in the current study did so later in their college experience after they had accrued between 60-90 credits. This may very well have made those changes more likely to negatively impact their grade point average. This finding seems to provide some support for the notion that changing majors early is less likely to negatively impact a student's grade point average; however, the finding that first generation students who did not change majors had higher grade point averages than first generation students who changed majors warrants additional exploration. Does this meant that first generation students are more likely to graduate in the major that they declare upon entry because they are more likely to settle for that major. Or that they are unaware of the process of changing majors? There is evidence in the research the FGCS are more likely than other students to remain in the jobs that they had during college, instead of selecting a job more related to their major. Future research in this area needs to focus on the timing of the major changes as well as the number of major changes. More study is needed that examines the impact of career decision-making during college on a student's career success after college.

Implications for Practice in Higher Education Institutions

It is interesting to note that as sophomores college students struggled with summarizing the skills that they had developed in previous jobs. They continued to struggle with performing a similar task--preparing a good resume--as seniors. Preparing a good resume requires that students understand how their cumulative experiences might apply to a particular job or career. For this reason some institutions are transforming their comprehensive curriculum to add career tasks at developmentally appropriate times throughout the student's college career (Gore & Hunter, 2010; Thayer, 2000). Career development is intentionally infused into courses throughout the curriculum (Wessels & Sumner, 2014). While the current study is not longitudinal, there may be some implication for future research regarding when students are developmentally "ready" to accomplish certain career tasks.

Other institutions extend the delivery of developmentally appropriate services by requiring that students capture an electronic or digital portfolio of their sequential career development experiences (Wessels & Sumner, 2014). This gradual accumulation of information and synthesis of activity better prepares students to conceptualize how their cumulative experiences (i.e., jobs, courses, internships, extracurricular activities, etc.) can enhance their marketability for a chosen career. These practices are grounded in career development literature and undergird by the traditional and nontraditional career development theory (Sharf, 2002; Parks-Yancey, 2012; Wessels & Sumner, 2014).

Best practices for helping first generation students develop skills that foster a successful transition from college to career include the following: career development infused curricula (Wessels & Sumner, 2014); career courses (Ayala & Striplin, 2002); learning communities (Thayer, 2000; Tym et al., 2004); proactive academic advising (Spight, 2013; Varney, 2012); linked courses (Tym, et al., 2004); first generation peer mentors (Wiljanen, 2003); career counselors (Hicks & McFrazier, 2014; Wiljanen, 2003); electronic career portfolios (Eaton & Kleshinski, 2014; Riklan, 2014); etiquette dinners (Landgraf, Stanko, Jinkerson, 2012); networking fairs (Wessels & Sumner, 2014); and federal college access programs such as TRIO, GEAR UP, and Upward Bound (Ayala & Striplin, 2002).

Eaton and Kleshinski (2014) advocate for early career interventions led by career professional who are creative and understand how to help students translate their cumulative experiences into a marketable resume. They also suggest the use of electronic career portfolios and video resumes to help students track and creatively document their experiences for professional presentation to employers. In discussing their career development programming goals they say, “It [is] important to infuse this program into the curriculum and intentionally focus on career topics at the appropriate time during a student’s academic path. Our goal was [to develop] a program that provided students with the opportunity to gain relevant and applicable career related skills and would utilize the expertise….”

First generation students will also be best served by intrusive (proactive) academic advisors who are committed to helping students build and alter early degree plans, audit degree progress, learn how and when to use academic resources, build social and career networks, and negotiate competing interests from family and peers (Darling & Smith, 2007; Sickles, 2004). This support will require an ongoing dialogue so that students are proactively provided the services that they need in a developmentally timely manner. Several studies highlight the importance of infusing career development programming throughout the college experience to allow students the opportunity to cognitively process the information that they receive.

Career advising services should also be provided in a manner that invokes critical reflection and inquiry (Sampson, Peterson, Reardon, & Lenz, 2013). This might means that some students will need to learn, generally, how to make decisions. Using a systematic model to help students process information and align the summative results with their interest and aptitude will serve the career decision-making needs of these students well. This systematic approach will allow students the time needed to analyze critically their cumulative experiences (academic, work-related, social, and personal) and inform their career decision-making. Building an intentional and timely career programming and support model should help students become more successful, and in turn, increase their career decision-making self-efficacy.

Implications for Future Research

The research is clear that first generation student's experiences are much different in college than their non-first generation peers. Their motivation to succeed, aspiration to excel, academic performance, social and academic engagement patterns, and the way that they make career decisions are all very different (Chen, 2005; Vuong, Welty, and Tracz, 2010; Ishitani, 2004). The unique experiences of first generation students require a different approach to their career development than that currently utilized for students who are not first generation students. Most of the career development research on first generation students is focused on their middle school, high school, and their transition to college (Chen, 2005; Gibbons & Borders, 2010; Ishitani, 2004). More research is needed that focuses on the students' experiences during college, often referred to as the *murky middle* in the literature (EAB. 2014). In their study of the post graduate experiences and earnings of first generation students, Pascarella, Pierson, Wolniak, & Terenzini (2004) found that the college experiences of first generation students are so different that they warrant the development of different models of career development in college. Currently, career counselors and advisors tend to use the same approach for all students. However, using career assessments to determine the particular needs of any given student will be critical in providing a relevant and effective career development experience.

Several researchers have advocated for additional longitudinal research studies that assess the changes in career decision-making self-efficacy over time (Hirudayaraj, 2011). This study also calls for additional focus on the "murky middle" of college. While the research on academic success and major changing is clear that there is some "phenomenon" occurring during the middle of the college experience that negatively impacts a student's academic progress, none of the studies has identified exactly what factors might cause the impact. In the last two years major changing behavior has surfaced as a critical factor impacting student success. Most of the research shows that changing majors actually increases a student's ability to graduate if she or he does so by the time they accrue 45 credit hours. What, then, occurs with those students who change majors after 45 credit hours (after sophomore year)?

Much of the past research on career decision-making self-efficacy has focused on pre-entry college students, first year college students, or students who were in transition from college to career. There is a growing body of literature, however, that highlights the need for additional academic and career support during the sophomore year (Gore & Hunter, 2010). Gore and Hunter (2010) state that the lack of support given to sophomores makes it more difficult for them to select a major and prolongs the time that they drift without academic focus through the college experience. They further highlight the importance of early career development to help students more quickly integrate into the college culture and engage with extracurricular experiences. Gore and Hunter (2010) emphasize the need for timely career development support for all students. This support will require some customization that can be accomplished using career assessment tools.

Limitations of the Study

While the results of this study have provided insight about how the career decision-making self-efficacy of first generation students is impacted by changing academic majors, they are not generalizable to other populations of first generation students. The sample for this study was comprised of students enrolled in a STEM intensive and highly selective research institution. Because the institution is highly selective the population of first generation students who were admitted to this particular institution tends to have higher than average SAT scores, ACT scores, and high school grade point averages. This influences the population validity as the sample may not be representative of the general population of first generation students. Additionally, the grade point averages of the students may be much higher than the general population of first generation students. This dynamic might explain why first generation students in this study who did not change majors had higher grade point averages as well.

Another factor that threatens the internal validity of the population is that far more of the students (first generation and non-first generation) who participated in the study were juniors and seniors. This introduces the threat of sample bias because upper-class students are over-represented, making the sample less representative than the general student population. We also found that a student's development and time in college impacts their career decision-making. While it was intentional to leave out first year students an even distribution across the general student population would have optimized the validity of the study.

Potential error may have been introduced in the study because of the difficulty in counting the number of major changes. It is extremely difficult to capture the accurate number of major changes because there is a national trend for students to remain enrolled in one major while pursuing a different major. The *phantom major* phenomenon complicates the ability to capture students changing majors because some major-changers are "hidden" and will not be reflected in any dataset. This factor has caused much concern as many universities are trying to support major-changers but can't always identify or quantify students who need the assistance. For this reason, the actual number of students who are changing majors is more likely than not underrepresented in the sample.

The examination of the differences in the 25 item-level scores of the CDSE--SF provided some interesting information to consider in future studies of the impact of changing majors on career decision-making self-efficacy. However, future studies using statistical methodologies that include multiple variables in the data analysis may yield additional insights and results that are more likely to be generalizable across the population of first generation students. In future studies it is also critically important to use a qualitative methodology to determine just how many times students are attempting to change majors. Self-reported data may be more accurate than data reflected through the student information portal. It is quite unclear how many students would like to change majors if they were permitted to do so, but do not change because they are unable to be admitted into their major of choice. A more reliable approach to identifying the number of major changes might be to conduct in depth interviews with students to determine how many times they "desired to" or unsuccessfully "attempted to" change their major.

Finally, it is important to note that there is much diversity within the population of first generation college students. The literature also shows that low-income first generation students have lower grade point averages, pass fewer credit hours, and are even more challenged by the career decision-making process than their higher- income peers. For this reason, future studies will require some additional disaggregation of the first generation student group to reduce the likelihood of threat to the internal validity of the studies.

Conclusion

First generation college students need the career development support more than other students who are not first generation. The research is clear that first generation students have limited college knowledge and access to information about careers and majors, and are not always aware of their knowledge and skill deficits. The aforementioned practices and services will provide first generation students with the tools and resources necessary to guide their own success through college and career. While these recommendations are focused on first generation students a review of the research reflects that similar resources and practices would be beneficial to the general population of students as well. Colleges wishing to positively impact the success of first generation student will need to make an investment in career advising and career assessment. While it remains critical to give some focus to career decision-making in the first year of college, it is as important to create flexible infrastructures and policies that focus beyond the first year and through the transition from college to career.

References

Adams, C. (2013, November 11). Students' planned majors and academic interests are often out of sync. *Education Week*. Retrieved from: http://blogs.edweek.org/edweek/college_bound/2013/11/high_school_students_planned_college_majors_and_academic_interests_often_are_a_mismatch.html

Adelman, C. (1999). *Answers in the Toolbox: Academic Intensity, Attendance Patterns, and Bachelor's Degree Attainment*. Washington, DC: U.S. Department of Education. Office of Educational Research and Improvement.

Adelman, C. (2006). The Toolbox Revisited: the path to degree completion from high school through college. Washington, DC: US Department of Education. Retrieved from: www.ed.gov/rschstat/research/pubs/toolboxrevisit/index.html

Agresti, A., & Finlay, B. (2009). St*atistical Methods for the Social Sciences* (4th ed.). Upper Saddle River, NJ: Pearson Prentice Hall.

Aguayo, D., Herman, K., Ojeda, L., & Flores, L.Y. Culture predicts Mexican Americans' college self-efficacy and college performance. *Journal of Diversity in Higher Education*, Vol 4(2), 79-89. http://dx.doi.org/10.1037/a0022504

Allen, J., & Robbins, S. B. (2008). Prediction of college major persistence based on vocationalinterests, academic preparation, and first-year academic performance. *Research in Higher Education*, 49(1), 62-79.

Allen, J., & Robbins, S. (2010). Effects of interest-major congruence, motivation, and academic performance on timely degree attainment. *Journal of Counseling Psychology*, 57(1), 23-25.

American College Testing Incorporated (2015). *ACT College Choice Report Part 1: Preferences and Prospects.* Retrieved from: http://www.act.org/collegechoice/

American Psychological Association (2010). College students exhibiting more severe mental illness, study finds. Washington, DC: American Psychological Association. (August 12). Retrieved from: http://www.apa.org/news/press/releases/2010/08/students-mental-illness.aspx

Anglin, D. M., & Wade, J. C. (2007). Racial socialization, racial identity, and Black students' adjustment to college. *Cultural Diversity and Ethnic Minority Psychology*, 13, 207-215. doi:10.1037/10099-9809.13.3.207

Arnett, J. E. (2013). Internalized heterosexism, social support, and career development in lesbian, gay, and bisexual undergraduate and graduate students: An Application of Social Cognitive Career Theory. Master's Thesis, University of Tennessee. http://trace.tennessee.edu/utk_gradthes/2594.

Arcidiacono, P. (2004). Ability sorting and returns to college major. *Journal of Econometics*, 121(1-2), 343-375.

Arnett, J. E. (2013). Internalized Heterosexism, Social Support, and Career Development in Lesbian, Gay, and Bisexual Undergraduate and Graduate Students: An Application of Social Cognitive Career Theory. Master's Thesis, University of Tennessee Knoxville. http://trace.tennessee.edu/utk_gradthes/2594

Arthur, N., & McMahon, M. (2005). Multicultural career counseling: Theoretical applications of the systems theory framework. *The Career Development*

Quarterly, *53*, 208-222. Retrieved from http://www.counseling.org/docs/david-kaplan%27s-files/arthur-n-mcmahonFE4D15E5D31D.pdf?sfvrsn=2

Ary, D., Cheser-Jacobs, L., Sorenson, C., & Walker, D. A. (2010). *An Introduction to Research in Education* (9th ed.). Belmont, CA: Wadsworth.

Astin, A. W. (2006). Making sense of degree completion. *Journal of College Student Retention*, 7 (1-2), 5-17.

Austin, C. Y. (2010). Perceived factors that influence career decision self-efficacy and engineering related goal intentions of African American high school students. *Career and Technical Education Research*, 35 (3), 119-135.

Ayala, C., & Striplen, A. (2002). A. Career introduction model for first generation college freshmen students. U. S. Department of Education Report, November.

Bailey, M., & Dynarski, S. (2011). Gains and gaps: Changing inequality in U.S. college entry and completion. *National Bureau of Economic Research*, 1-30. Retrieved from http://www.nber.org/papers/w17633.pdf

Bailey, T., & Karp, M. M. (2003). Promoting College Access and Success: A Review of Credit-Based Transition Programs. U.S. Department of Education, Office of Adult and Vocational Education: Washington, D.C.

Bandura, A. (1977). Self-efficacy: Towards a unifying theory of behavior change. Psychological Review, 84 (2), 191-215.

Bandura, A. (1997). Self-efficacy: The Exercise of Control. New York : Freeman.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice Hall, Inc.

Baum, S., Ma, J., & Payea, K. (2012, May). Trends in public higher education: Enrollment, prices, student aid, revenues, and expenditures. Retrieved from College Board Trends in Higher Education Series website: http://trends.collegeboard.org/sites/default/files/trends-2012-public-higher-education-expenditures-brief.pdf

Beggs, J. M., Bantham, J. H., & Taylor, S. (2008). Distinguishing the factors influencing college students' choice of major. *College Student Journal*, 42(2), 381-394.

Benton, S. A., Robertson, M., Tseng, W., Newton, F., & Benton, S. L. (2003). Changes in counseling center client problems across 13 years. *Professional Psychology, Research and Practice*, 34, 66-72.

Berrett, D. (2012, June 3). Changing majors is no big deal if the timing is right. Retrieved from The Chronicle of Higher Education website: http://chronicle.com/article/Changing-Majors-Is-No-Big-Deal/132105/

Betz, N. E. (2005). Women's career development. In *Career development and counseling: Putting theory and research to work* (pp. 253-280). Hoboken, NJ: John Wiley & Sons, Inc.

Betz, N. E., & Luzzo, D. (1996). Career assessment and the career decision self-efficacy scale. *Journal of Career Assessment*, 4, 313-328.

Betz, N. E., & Taylor, K. (2012). *Career decision-making self-efficacy scale manual and sampler set.* Columbus, OH: Mind Garden Incorporated.

Betz, N.E., Hammond, M., & Multon, K . (2005). Reliability and validity of response continua for the career decision self-efficacy scale. *Journal of Career Assessment*, 13, 131-149.

Betz, N. E., Klein, K., & Taylor, K. (1996). Evaluation of a short form of the career decision self-efficacy scale. *Journal of Career Assessment*, 4, 47-57.

Bordens, K. S., & Abbott, B. B. (2002). *Research Design and Methods: A Process Approach* (5th ed.). New York, NY: McGraw-Hill.

Bowen, W. G., Chingos, M. M., & McPherson, M. S. (2011). *Crossing the finish line: Completing college at America's public universities*. Princeton, NJ: Princeton University Press.

Brost, J., & Payne, K. (2011). First-Generation Issues: Learning Outcomes of the Dismissal Testimonial for Academically Dismissed Students in the Arts and Sciences. *New Directions for Teaching and Learning*, 127, 69-79. doi: 10.1002/tl.458

Brown, K. S. (2009). Factors that Predict Academic Achievement for Students Who are Undecided Majors. Dissertation, Virginia Polytechnic Institute and State University.

Brown, P. and Hesketh, A. (2004). *The mismanagement of talent: employability and jobs in the knowledge economy*. Oxford: Oxford University Press.

Bullock-Yowell, E., Andrews, L., & Buzzetta, M. E. (2011). Explaining Career Decision-Making Self-Efficacy: Personality, Cognitions, and Cultural Mistrust. *The Career Development Quarterly*, 59: 400–411. doi: 10.1002/j.2161-0045.2011.tb00967.x

Bullock-Yowell, E., Peterson, G. W., Reardon, R. C., Leierer, S. J., & Reed, C. A. (2011). Relationships among career and life stress, negative career thoughts, and career decision state: A cognitive information processing perspective. *The Career Development Quarterly*, *59*(4), 302-314. Retrieved from http://search.proquest.com.prox.lib.ncsu.edu/docview/875296295?accountid=12725

Bullock-Yowell, E., McConnell, A. E., & Schedin, E. A. (2014). Decided and undecided students: Career self-efficacy, negative thinking, and decision-making difficulties. *NACADA Journal*, 34 (1), 22=34.

Bureau of Labor Statistics, U.S. Department of Labor, (2007, June 28). *Stem occupations and job growth*. Retrieved from Bureau of Labor Statistics website: http://www.bls.gov/opub/ted/2007/jun/wk4/art04.htm

Byars-Winston, A. M., & Fouad, N. A. (2008). Math and science social cognitive variables in college students: Contributions of contextual factors in predicting goals. *Journal of Career Assessment*, 18, 425-440.

Campo, J., Weissman, J., Walmsley, A., & Snell, A. (*2012*). In Their own words: Best practices for advising millennial students about majors. *NACADA Journal*, 32 (2), 26-35.

Carnevale, A.P., Rose, S. J., & Cheah, B. (2011). *The College Payoff: Education, Occupations, Lifetime Earnings*. Washington, DC: Georgetown University Center on Education and the Workforce. Retrieved from: http://knowledgecenter.completionbydesign.org/sites/default/files/275%20Carnevale%202011.pdf

Carnevale, A. P., Smith, N., & Strohl, J. (2010). *Help Wanted: Projections of Jobs and Education Requirements Through 2018.* Washington DC: Georgetown University

Center on Education and the Workforce. Retrieved from: http://cew.georgetown.edu/jobs2018/

Carnevale, A. P., Smith, N., & Strohl, J. (2013). *Recovery: Job growth and education requirements through 2020.* Washington DC: Georgetown University Center on Education and the Workforce. Retrieved from: https://georgetown.app.box.com/s/tll0zkxt0puz45hu21g6

Chaney, D., Hammond, M. S., Betz, N. E., & Multon, K. D. (2007). The Reliability and Factor Structure of the Career Decision Self-Efficacy Scale-SF with African Americans. *Journal of Career Assessment*, 15(2), 194-205.

Chapman, C., Laird, J., Ifill, N., & KewalRamani , A. (2011). Trends in High School Dropout and Completion Rates in the United States: 1972-2009. Washington DC: U.S. Department of Education- National Center for Educational Statistics.

Chen, X. (2005). *First Generation Students in Postsecondary Education: A Look at their College Transcripts.* Washington DC: U.S. Department of Education, National Center for Education Statistics.

Chen, X., & Carroll, C. D. (2005). First-generation students in postsecondary education: A look at their college transcripts. Washington, DC: U. S. Department of Education, National Center for Education Statistics.

Choi, B. Y., Park, H., Yang, E., Lee, S. K., Lee, L., Min, S. (2012). Understanding career decision self-efficacy: A Meta-analytic approach. *Journal of Career Development*, 39 (5), 443-460.

Choy, S. P. (2001). *Students whose parents did not go to college: Postsecondary access, persistence, and attainment*. Washington, DC: Department of Education, National Center on Education Statistics. Retrieved from: http://nces.ed.gov/pubs2001/201126.pdf .

Choy, S. P. (2002). Nontraditional Undergraduates: Findings from the Condition of Education (NCES2002012). Washington, DC: United States Department of Education, National Center for Education Statistics.

Choy, S. P., & Bobbit, L. (2000). Low income students: who they are and how they pay for their education. Washington, DC: Department of Education National Center for Education Statistics, NCES 2000-169.

Coffman, S. (2011). A social constructionist view of issues confronting first-generation college students. *New Directions for Teaching and Learning*, 81–90. doi: 10.1002/tl.459

Collier, P. J., & Morgan, D. L. (2008). "Is that paper really due today?': Differences in first-generation and traditional college students' understandings of faculty expectations." *Higher Education,* 55 (4), 425-46.

Colorado State University (2011). *Major Changes and Persistence*. Fort Collins, CO: Institutional Research. Retrieved from: http://www.ir.colostate.edu/pdf/briefs/Major-Changes-and-Persistence-Patterns.pdf

Cook, B., & Pullaro, N. (2010). *College graduation rates: Behind the numbers.* American Council on Education Center for Policy Analysis. Retrieved September 27, 2011, from http://www.acenet.edu

Couper, M. P. (2000). Web-based surveys: A Review of issues and administration. *Public Opinion Quarterly*, 64, 464-494.

Creed, P. A., Patton, W., & Padeaux, L. (2006). Predicting change over time in career planning and career exploration for high school students. *Journal of Adolescence*, 30, 377-392. Retrieved from: http://www.choixdecarriere.com/pdf/5873/CreedPattonPrideaux.pdf

Creswell, J. W. (2008). *Educational research: Planning, conducting, and evaluating qualitative and quantitative research* (3rd ed.). Upper Saddle River, NJ: Pearson Education.

Crites, J. O. (1978). *Career Maturity Inventory*. Monterey, CA: CTB/McGraw Hill.

Cuseo, J. (2005). "Decided," "undecided," and "in transition": Implications for academic advisement, career counseling & student retention. In *Improving the first year of college: Research and practice* (pp. 27-48). Mahwah, NJ: Lawrence Erlbaum Associates Inc.

Dahling, J. J., Melloy, R., & Thompson, M. N. (2013). Financial strain and regional unemployment as barriers to job search self-efficacy: A Test of social cognitive career theory. *Journal of Counseling Psychology*, 60 (2), 210-218.

Daire, A. P., LaMothe, S. and Fuller, D. P. (2007), Differences Between Black/African American and White College Students Regarding Influences on High School Completion, College Attendance, and Career Choice. *The Career Development Quarterly*, 55: 275–279. doi: 10.1002/j.2161-0045.2007.tb00083.

Dawson-Threat, J., & Huba, M. E. (1996). *Choice of Major and Clarity of Purpose among College Seniors*. Washington, DC: Distributed by ERIC Clearinghouse, http://www.eric.ed.gov/contentdelivery/servlet/ERICServlet?accno=ED394430

Deil-Amen, R. (2011). The "traditional" college student: A smaller and smaller minority and its implications for diversity and access institutions. *Mapping Broad-Access Higher Education*, 1-38. Retrieved from http://cepa.stanford.edu/sites/default/files/2011%20Deil-Amen%2011_11_11.pdf

Demulier, V., Le Scanff, C., & Yannick, S. (2013). Psychological predictors of career planning among active elite athletes: An Application of the Social Cognitive Career Theory. *Journal of Applied Sport Psychology,* 25 (3), 341-353. Retrieved from: http://www.tandfonline.com/doi/abs/10.1080/10413200.2012.736444#.VDI3qdhASM8.

DeSilver, D. (2014, January 15). College enrollment among low-income students still trails richer groups. Retrieved from Pew Research Center website: http://www.pewresearch.org/fact-tank/2014/01/15/college-enrollment-among-low-income-students-still-trails-richer-groups/

Dickinson, J. (2007). *An Examination of the Applicability of Social Cognitive Career Theory for African American College Students.* (Electronic Thesis or Dissertation). Retrieved from https://etd.ohiolink.edu/

Dickson, L. M. (2010). Race and gender differences in college major choice. In *Beyond Admissions: Rethinking College Opportunity and Outcomes,* pp.108-124. Thousand Oaks, CA: Sage Publications.

Dietz, J. (2010). The myth that college and major choice decides johnny's future. *College Student Journal*, *44*(2), 234-249. Retrieved from http://www.readperiodicals.com/201006/2054008751.html#ixzz3PPOmAF5I

Dillman, D. A. (2000). Mail and web-based surveys: the tailored design method. NY: John Wiley & Sons.

Eaton, T., & Kleshinski, A. (2013). Improving Undergraduate Learning For Employability Through International Exposure. *American Journal Of Business Education (AJBE), 7*(1), 49-58. Retrieved from: http://www.cluteinstitute.com/ojs/index.php/AJBE/article/view/8319

Education Advisory Board (2014). *The Murky Middle Project: A New Perspective on Elevating Student Success*. Washington, DC: Education Advisory Board Student Success Collaborative.

Egan, K., Stolzenberg, E. B., Ramirez, J. J., Suchard, M. R., Hurtado, S. (2014). The American Freshman: National Norms Fall 2014. Los Angeles: Higher Education Research Institute. Retrieved from: http://www.heri.ucla.edu/monographs/TheAmericanFreshman2014.pdf

Engle, J. (2007). Postsecondary access and success for first-generation college students. *American Academic*, *3*, 25-48.

Engle, J., & O'Brien, C. (2007). *Demography is not destiny: Increasing the graduation rates of low income college students at large public*. Washington, DC: Pell Institute for the Study of Opportunity in Higher Education. Retrieved from:

http://www.pellinstitute.org/downloads/publications-Demography_Is_Not_Destiny.pdf

Engle, J., & Tinto, V. (2008). *Moving Beyond Access: College Success for Low-Income First Generation Students*. Washington, DC: Pell Institute for Study of Opportunity in Higher Education. Retrieved from: http://www.pellinstitute.org/downloads/publications-Moving_Beyond_Access_2008.pdf

Evans, N. J., Forney, D. S., & Guido-DiBrito, F. (1998). *Student development in college: Theory, research, and practic*e. San Francisco, CA: Jossey-Bass.

Evans, N. J., Forney, D. S., Guido, F. M., Patton, L. D., & Renn, K. A. (2010). Perry's theory of intellectual and ethical development. In *Student development in college: Theory, research, and practice (2nd ed.)* (pp. 82-98). San Francisco, CA: Jossey-Bass.

Evans, N., Forney, D., Guido, F., Patton, L., & Renn, K. A. (2010). Psychosocial identity development. *Student development in college: Theory, research and practice* (2nd ed.) (pp. 52–54). San Francisco, CA: Jossey-Bass.

Ewert, S., & Kominski, R. (2014). *Measuring alternative educational credentials, report* . Washington DC: U.S. Census Bureau. Retrieved from: http://www.census.gov/prod/2014pubs/p70-138.pdf

Feldman, K. A., & Newcomb, T. M. (1994). *The Impact of College on Students*. New Brunswick, NJ: Transactions Publishers.

Foote, B. (1980). Determined- and undetermined-major students: how different are they? *Journal of College Student Personnel*, 21(1), 29-33.

Foraker, M. J. (2012). Does changing majors really affect the time to graduate? The impact of changing majors on student retention, graduation, and time to graduate. *Western Kentucky University: Office of Institutional Research*. Retrieved from: http://www.wku.edu/instres/documents/air_major_change.pdf

Forbus, P., Newbold, J. J., & Mehta, S.S.((2011). A study of non-traditional and traditional students in terms of their time management behaviors, stress factors, and coping strategies. Retrieved Oct 11 2015 from http://www.thefreelibrary.com/A+study+of+non-traditional+and+traditional+students+in+terms+of+their...-a0273616190

Fouad, N. A., & Brown, M. (2000). Role of race and social class in development: Implications for counseling psychology. In *Handbook of Counseling Psychology* (3rd ed.), (379-410). New York: Wiley.

Fouad, N. A., & Byars-Winston, A. (2005). Cultural context of career choice: Meta-analysis of race/ethnicity differences. The Career Development Quarterly, 53, 223–233.

Fouad, N. A., Cotter, E. W., Fitzpatrick, M. E., Kantamneni, N., Carter, L., & Bernfeld, S. (2010). Development and validation of the family influence scale. Journal of Career Assessment, 18(3), 276–291. doi:10.1177/1069072710364793

Freeman, J. A., & Hirsch, B. T. (2008). College majors and the knowledge content of jobs. *Economics and Education Review*, 27, 517-535.

Freedman, L. (2013). The developmental disconnect in choosing a major: Why institutions should prohibit choice until second year. *The Mentor*. Retrieved from http://dus.psu.edu/mentor/2013/06/disconnect-choosing-major/

Fullerton, T. F., & Britton, J. O. (1976). Collegiate persistence of vocationally undecided males. *The Journal of Educational Research*, 69 (8), 300-304.

Fuqua, D. R. and Hartman, B. W. (1983). Differential diagnosis and treatment of career indecision. *The Personnel and Guidance Journal*, 62: 27–29. doi: 10.1111/j.2164-4918.1983.tb00112.x

Gallagher, R. P. (2006). A National survey of counseling center administrators. *International Association of Counseling Services*. Retrieved from: http://www.collegecounseling.org/pdf/2006_survey.pdf

Galotti, K. M., Ciner, E., Hope, E. A., Geerts, H. J., Allison, R., & Woulfe, J. (2006). Decision-making styles in a real-life decision: Choosing a college major. *Personality and Individual Differences*, 41 (4), 629-639.

Germeijs, V., & De Boeck, P. (2002). A Measurement scale for indecisiveness and its relationship to career indecision and other types of indecision. *European Journal of Psychological Assessment*, 18 (2), 113-122.

Gianokos, I. (1999). Patterns of career choice and career decision-making self-efficacy. *Journal of Vocational Behavior*, 54 (2), 244-258. doi: 10.1006/jvbe.1998.1668

Gibbons, M. M. and Borders, L. D. (2010), Prospective First-Generation College Students: A Social-Cognitive Perspective. *The Career Development Quarterly*, 58, 194–208. doi: 10.1002/j.2161-0045.2010.tb00186.x

Gibbons, M. M. & Shoffner, M. F. (2004). Prospective First-generation college students: Meeting their needs through Social Cognitive Career Theory. *Professional School*

Counseling, 8 (1), 91-98. http://auspace.athabascau.ca/bitstream/2149/1336/1/Online_survey_design_IJHCI04.pdf

Gibbons, M. M. and Woodside, M. (2014), Addressing the needs of first-generation college students: Lessons learned from adults from low-education families. *Journal of College Counseling*, 17 (1), 21–36. doi: 10.1002/j.2161-1882.2014.00045.x

Gladieux, L. E. (2004). Low- income students and affordability in higher education. In *Low Income Students in Higher Education* (17-58). New York: Century Foundation Press.

Goins, P. (2012). Increasing degree attainment in postsecondary education: A Challenge for all states. Washington, DC: Council on State Governments. Retrieved from: http://knowledgecenter.csg.org/kc/content/increasing-degree-attainment-postsecondary-education-challenge-all-states.

Gordon, V.N. (1984). The undecided college student: An academic and career advising challenge. Springfield, Ill: Thomas.

Gordon, V.N. (1994) The undecided college student: An academic and career advising challenge (2nd Ed.). Springfield, Ill: Thomas.

Gordon, V. N. (1998). Career decidedness types. The Career Development Quarterly, 46 (4), 386-403.

Gordon, V.N. (2006). Career Advising: An Academic Advisor's Guide. San Francisco: Jossey-Bass.

Gordon, V. N. (2007). The undecided college student: An academic and career advising challenge (3rd ed.). Springfield, IL: Charles C Thomas.

Gordon, V. N., & Steele, G. E. (2003). Undecided first-year students: A 25-year longitudinal study. *Journal of the First-Year Experience*, 1 (1), 19-38.

Gordon, V. N., Habley, W. R., & Grites, T. J. (2008). Academic Advising: A Comprehensive Handbook (2nd ed.). San Francisco, CA: Jossey-Bass.

Gore, P. A. (2005). *Facilitating the Career Development of Students in Transition* (Monograph No. 43), Columbia, SC: National Resource Center for the First Year Experience and Students in Transition.

Gore, P. A., & Hunter, M.S., (2010*). Promoting career success in the second year of college*. In Hunter, M. S., Tobolowsky, B. F., Gardner, J. N., Evenbeck, S. E., Pattengale, J. A., Schaller, M. A., Schreiner, L. A., & Associates (2010). Helping Sophomores Succeed: Understanding the Second Year Experience. San Francisco : Jossey-Bass.

Graunke, S.S., Woosley, S.A., & Helms, L.L. (2006). How do their initial goals impact students' chances to graduate? An exploration of three types of commitment. *NACADA Journal*, 26(1), 13-18.

Grier-Reed, T. L., Skaar, N. R., Conkell- Ziebell, J. L. (2009). Constructivist career development as a paradigm of empowerment for at-risk culturally diverse college students. *Journal of Career Development*, 35(3), 290-305.

Grier-Reed, T., & Ganuza, Z. (2012). Using constructivist career development to improve career decision self-efficacy in TRiO students. *Journal of College Student Development*, 53 (3), 464-471.

Hackett, G., & Betz, N. (1981). A Self-efficacy approach to the career development of women. *Journal of Vocational Behavior*, 18 (3), 326-39.

Hackett, G., & Byars, A. M. (1996). Social Cognitive Theory and the Career Development of African American Women. *The Career Development Quarterly*, 44: 322–340. doi: 10.1002/j.2161-0045.1996.tb00449.x

Hackett, G., & Kohlhart, J. D. (2012). Feminist vocational/career theory and practice. In *The Oxford Handbook of Feminist Multicultural Counseling Psychology* (pp. 255-279). New York, NY: Oxford University Press. doi:10.1093/oxfordhb/9780199744220.013.0014

Hamilton, J. C. (1999). The ethics of conducting social science research on the Internet. *The Chronicle of Higher Education*, 46 (15), B6–7.

Hanover Research Group (2014). *Encouraging Students to Embrace STEM Fields*. Washington, DC: Hanover Research Inc.

Hartig, N., & Steigerwald, F. (2007). Understanding family roles and ethics in working with first generation college students and their families. *Family Journal of Counseling and Therapy for Couples and Families*, 15 (2), 159-162

Hicks, T. (2003). First-generation and non-first-generation pre-college students' expectations and perceptions about attending college. *Journal of College Orientation and Transition*, 11(1), 5-19.

Hicks, T. (2012). Advising the first-generation college student: Effective retention tools for colleges and universities. *The Mentor*. Retrieved from http://dus.psu.edu/mentor/old/articles/021216th.htm

Hicks, T., & McFrazier, M. (2014). *College Student Self-Efficacy Research Studies*. Lanham, MD: University Press of America.

Hill, C., Corbett, C., & St. Rose, A. (2010). *Why So Few: Women in Science, Technology, Engineering and Math*. Washington, DC: American Association of University Women.

Holland, J. (1973). *Making Vocational Choices: A Theory of Careers.* Englewood Cliffs, NJ: Prentice-Hall.

Horn, L., Nuñez, A. M., & Bobbit, L. (2000). *Mapping the Road to College: First-Generation Students' Math Track, Planning Strategies, and Context of Support.* Washington DC: U.S. Department of Education. National Center for Education Statistics.

Hossler, D., Schmidt, J., & Vesper, N. (1999). *Going to College: How Social, Economic, and Educational Factors Influence the Decisions Students Make*. Baltimore, MD: John Hopkins University Press.

Hsieh, H.-H., & Huang, J.-T. (2014), The Effects of socioeconomic status and proactive personality on career decision self-efficacy. *The Career Development Quarterly*, 62: 29–43. doi: 10.1002/j.2161-0045.2014.00068.x

Huang, Y., & Healy, C. C. (1997). The Relations of Holland-typed majors to students' freshman and senior work values. *Research in Higher Education*, 38, (4), 455 -477.

Ibrahimovic, A. & Potter, S. (2013). Career counseling with low income students: Using Social Cognitive Career Theory and the Theory of Circumscription and Compromise. *Career Planning and Adult Development Journal*, 29 (4), 60.

Isidore, C. (2009, January 30). Economy: Sharpest decline in 26 years. Retrieved from CNN Money website: http://money.cnn.com/2009/01/30/news/economy/gdp/index.htm

Ishitani, T. T. (2003). A Longitudinal Approach to Assessing Attrition Behavior Among First-Generation Students: Time-Varying Effects of Pre-College Characteristics. *Research in Higher Education*, 44(4), 433–449.

Jacobsen, L. A., & Mather, M. (2010). U.S. Economic and Social Trends Since 2000. *Population Bulletin*. Washington, DC: Population Reference Bureau.

Jenkins, R. (2012, October 15). *The new 'traditional student'*. Retrieved from The Chronicle of Higher Education website: http://chronicle.com/article/The-New-Traditional-on/135012/

Jin L., Watkins D., & Yuen M. (2009). Personality, career decision self-efficacy and commitment to the career choices process among Chinese graduate students. *Journal of Vocational Behavior,* 74, 47-52.

Johnson, L. (2011, Jan. 2). *Employers say college graduates lack job skills*. Retrieved from Chronicle of Higher Education website: http://chronicle.com/article/Employers-Say-College/130013/

Jones, L. K. (2014). *Choosing a college major based on your personality: What does the research have to say?* Retrieved from: http://www.careerkey.org/pdf/choosing-a-major-with-personality-match.pdf

Jones, L. K., & Jones, J. W. (2012). *Personality- College Major Match and Student Success: A Guide for Professionals Helping Youth and Adults Who Are in College or Are College-Bound*. Retrieved from http://www.careerkey.org/pdf/Personality-College_Major_Match_Guide_Professionals.pdf

Kadison, R. & DiGeronimo, T.F. (2004). College of the overwhelmed: The campus mental health crisis and what to do about it. San Francisco: Jossey-Bass.

Keim, J., Strauser, D. R., Ketz, K. (2002). Examining the differences in career thoughts of women in three low socioeconomic status groups. *Journal of Employment Counseling*, 39 (1), 31-42.

Kelly, M. E. (2009). Social Cognitive Career Theory as Applied to the School-To-Work Transition. Seton Hall University Dissertations and Theses (ETDs). Paper 1450.

Kelly, R. R., & Hatcher, K. (2013). Decision-Making Self-Efficacy and Barriers in Career Decision-making among Community College Students. *Community College Journal of Research and Practice*, 37 (2), 103-113.

Kim, D., Markham, F. S., & Cangelosi, J. D. (2002). Why students pursue the business degree: A comparison of business majors across universities. *Journal of Education for Business*, 78, 28-32.

Kim, Y.K., & Sax, L.J. (2009). Student-Faculty interaction in research universities: Differences by student gender, race, social class, and first-generation status. *Research in Higher Education*, 50, 437-459. doi: 10.1007/s1162-009-9127-x

King, M. (2008). Organization of academic advising services. In *Academic Advising: A Comprehensive Handbook* (pp. 246–257). San Francisco, CA: Jossey-Bass.

Krieshok, T.S., Ulven, J.C., Hecox, J. L., & Wettersten, K. (2000). Resume therapy and vocational test feedback: Tailoring interventions to self-efficacy outcomes. *Journal of Career Assessment*, *8*(3), 267-281.

Kramer, G.L., Higley, H.B., & Olsen, D. (1994). Changes in academic major among undergraduate students. *College and University*, 69(2), 88-98.

Lamos, E., Simon, M., & Waits (2010). *A Sharper Focus on Technical Workers: How to Educate and Train for the Global Economy*. Washington, DC: National Governors Association Center for Best Practices. Retrieved from: http://files.eric.ed.gov/fulltext/ED513106.pdf

Landgraf, E., Stanko, B., & Jinkerson, D. (2012). Preparing for the profession: The Accounting job search and beyond. *Contemporary Issues In Education Research (CIER), 5*(4), 315-326. Retrieved from http://www.cluteinstitute.com/ojs/index.php/CIER/article/view/7275

Lareau, A. (2003). *Unequal Childhoods: Class, Race, and Family Life*. Berkeley: University of California Press.

Lent, R. W., & Brown, S. D. (1996). Social cognitive approach to career development: An Overview. *Career Development Quarterly*, 44, 310-321.

Lent, R. W., Brown, S. D., & Hackett, G. (1994). Toward a unifying social cognitive theory of career and academic interest, choice, and performance. Journal of Vocational Behavior, 45 (1), 79-122.

Lent, R. W., Brown, S. D, & Hackett, G. (2000). Contextual supports and barriers to career choice: A social cognitive analysis. *Journal of Counseling Psychology*, 47 (1), 36-49.

Lent, R. W., Brown, S. D., Nota, L., Soresi, S. (2003). Testing social cognitive interest and choice hypotheses across Holland types in Italian high school students. *Journal of Vocational Behavior*, 62, 101-118.

Lent, R. W., Brown, S. D., Schmidt, J., Brenner, B., Gloster, C. S. (2005). Social cognitive predictors of academic interests and goals in engineering: Utility for women and students at historically Black universities. *Journal of Counseling Psychology*, 52, 84-92.

Lent, R. W., Sheu, H. B., Singley, D., Schmidt, J. A., Schmidt, L. C., Gloster, C. S. (2008). Longitudinal relations of self-efficacy to outcomes expectations, interests, and major choice goals in engineering students. *Journal of Vocational Behavior*, 73 (2), 328 – 335.

Lewallen, W. C. (1993). The impact of being "undecided" on college-student persistence. *Journal of College Student Development*, 34 (2), 79-122.

Lin, J. L., Lin, J. H., & Hwang, K. S. (2012). The Number of students needed for undecided programs at a college from a supply- chain viewpoint. *Mathematical Problems in Engineering*. doi.10.1155/2012/276518. Retrieved from: http://www.researchgate.net/publication/258383142_The_Number_of_Students_Needed_for_Undecided_Programs_at_a_College_from_the_Supply-Chain_Viewpoint

Lindley, L. D. (2005). Perceived barriers to career development in the context of Social Cognitive Career Theory. *Journal of Career Assessment*, 13 (3), 271-287.

Lipka, S. (2012). As portrait of typical student changes, so do worries about cost. Chronicle of Higher Education, Facts and Figures, August 26. Retrieved from: http://chronicle.com/article/As-Portrait-of-Typical-Student/133930

Lo Presti, A., Pace, F., Mondo, M., Nota, L., Casarubia, P., Ferrari, L., & Betz, N. E. (2013). An Examination of the structure of the Career Decision-making Self-efficacy Scale

(Short Form) among Italian high school students. *Journal of Career Assessment*, 21(2), 337-347.

Lumina Foundation (2014). *A Stronger Nation Through Higher Education: Closing the Gaps in College Degree Attainment. Annual Report*. Indianapolis, IN: Lumina Foundation. Retrieved from: http://www.luminafoundation.org/files/resources/a-stronger-nation-through-higher-education-2014.pdf

Luzzo, D. A. (1999). Identifying the career decision-making needs of nontraditional college students. *Journal of Counseling & Development*, 77 (2), 135-40.

Luzzo, D. A., & McWhirter, E. H. (2001). Sex and ethnic differences in the perception of educational and career-related barriers and levels of coping efficacy. *Journal of Counseling and Development*, 79, 61-67.

Lynch, M. (2013, January 23). It's tough to trailblaze: Challenges of first-generation college students. Retrieved from *Diverse Issues in Higher Education* website: http://diverseeducation.com/article/50898/

Makela, J. P., & Rooney, G. S. (2014). Framing assessment for career services: Telling our story. *New Directions for Student Services,* 65–80. doi: 10.1002/ss.20109

Makkula, M., Danylchuk, L., Miller, K. Tamerler, k. (2008). In *Compelling Counseling Interventions: Celebrating VISTAS Fifth Anniversary,* 115-124. Ann Arbor, MI: Counseling Outfitters.

Malgwi, C. A., Howe, M. A., & Burnaby, P. A. (2005). Influences on students'choice of college major. *Journal of Education for Business*, 80, 275-282.

Marchese, T.J. (1972). Reexamining the undergraduate sequence of studies. The Journal of Higher Education, 43(2),110-122.

Martinez, J.A., Sher, K. J., Krull, K. L., & Wood, P. K. (2009). Blue-collar scholars?: Mediators and moderators of university attrition in first-generation college students. *Journal of College Student Development*, 50 (1), 87-103.

McCalla-Wriggins, B. (2009). *Integrating career and academic advising: Mastering the challenge*. Retrieved from NACADA Clearinghouse of Academic Advising Resources Web site: http://www.nacada.ksu.edu/Resources/Clearinghouse/View-Articles/Changing-Majors.aspx

McCleaf, K.J. (2012, March). Improving our advisees' cultural capital. *Academic Advising Today, 35*(1). Retrieved from https://www.nacada.ksu.edu/Resources/Academic-Advising-Today/View-Articles/Improving-Our-Advisees-Cultural-Capital.aspx

McDaniels, R. M., Carter, J. K., Heinzen, C. J., Candrl, K. L., & Wieberg, A. M. (1994). Undecided/undeclared: Working with deciding students. *Journal of Career Development*, 21(2), 135-139.

McGraw, A., & Burr, M. (2011). Changing demands: The Workforce of yesterday, today, and tomorrow. *Cornell HR Review*, December 4. Retrieved from: http://www.cornellhrreview.org/changing-demands-the-workforce-of-yesterday-today-and-tomorrow/

McLean, C. & Hauschild, K. Advising Special Populations – Exemplary Program for Advising Undecided Students. Published in Huff, L. & Gordon, V. (2007) *National Academic Advising Association: Advising Special Populations*. p. 209-218.

McLean, C., Outing, K., Burton, D., & Crossley, M. (2010). *Major/Career Decision-making Model for Undecided Students* in Gore, P. & Phinney, L. (2010). Exploring the Evidence: Proven Career Development Initiatives -- published in Gore, P. A. (2005). Facilitating the Career Development of Students in Transition.

Mello, Z. R. (2009). Gender variation in developmental trajectories of educational and occupational expectations and attainment from adolescence to adulthood. *Developmental Psychology*, 44 (4), 1069-1080.

Micceri, (2002). *Will changing your major double your graduation chances*? Invited paper posted on the First-Year Assessment Listserv, sponsored by the Policy Center for the First Year of College. Retrieved from: http://www.brevard.edu/fycindex.htm.

Miller, M. J., Serndrowitz, R. K., Brown, S. D., Thomas, K., & McDaniel, C. (2009). A Confirmatory Test of the Factor Structure of the Short Form of the Career Decision Self-Efficacy Scale. *Journal of Career Assessment*, 17 (4), 507-519.

Montgomery, A. B. (2009). Kentucky Women Teachers' Education And Career Choice Decisions: An Application Of Social Cognitive Career Theory. Master's Thesis, University of Kentucky. Paper 639. http://uknowledge.uky.edu/gradschool_theses/639

Multon, K., Brown, S., & Lent, R. (1991). Relation of self-efficacy beliefs to academic outcomes: a meta-analytic investigation. *Journal of Counseling Psychology*, 38(1), 30-38. Retrieved from: http://www.researchgate.net/publication/232450715_Relation_of_self-efficacy_beliefs_to_academic_outcomes_A_meta-analytic_investigation.

Murphy, C. G., & Hicks, T. (2006). Academic characteristics among first-generation and non-first-generation college students. *College Quarterly*, 9 (2). Retrieved from: http://files.eric.ed.gov/fulltext/EJ835403.pdf

National Center For Education Statistics. (2012). Chapter 3: Postsecondary education. In *Digest of Education Statistics*. Washington DC: U.S. Department Of Education Institute Of Education Sciences National Center For Education Statistics. Retrieved from http://nces.ed.gov/programs/digest/d12/ch_3.asp.

National Commission on Accountability in Higher Education (2005). *Accountability for Better Results: A National Imperative for Higher Education*. Denver, CO: State Higher Education Executive Officers Association. Retrieved from: http://www.sheeo.org/sites/default/files/publications/Accountability%20for%20Better%20Results.pdf

Nauta, M. M. (2004). Self-efficacy as a mediator of the relationships between personality factors and career interests. *Journal of Career Assessment*, 12 (4), 381-394.

Navarro, R. L., Flores, L.Y., & Worthington, R. L. (2007). Mexican American middle school students' goal intentions in mathematics and science: A Test of Social Cognitive Career Theory. *Journal of Counseling Psychology*, 54 (3), 320-335. doi.10.1037/0022-0167.54.3.320

Nelson, D. B., Alexander, R. A., Martin, H. E., and Cunningham, B. L.(2012). *Advising students who are changing majors*. Retrieved from the NACADA Clearinghouse of Academic Advising Resources Web site:

http://www.nacada.ksu.edu/Resources/Clearinghouse/View-Articles/Changing-Majors.aspx

Nichols, A. H. (2011). *Developing 20/20 Vision on the 2020 Degree Attainment Goal: The Threat of Income-Based Inequality in Education*. Retrieved from http://www.pellinstitute.org/downloads/publications-Developing_2020_Vision_May_2011.pdf.

Niles, S. & Sowa, C. (1992). Mapping the nomological network of career self-efficacy. *Career Development Quarterly*, 41, 13-21.

Niu, L. (2010). Choosing an undergraduate STEM major: Family socioeconomic status, individual, and institutional factors. Dissertation. Univeristy of Florida. Retrieved from: http://www.airweb.org/GrantsAndScholarships/Documents/Grants2012/Niu%20-%20Final%20Report.pdf.

Noel, L. (1985). Increasing student retention: New challenges and potential. In Noel, L., Levitz, R., Saluri, D., & Associates. *Increasing Student Retention: Effective Programs and Practices for Reducing the Dropout Rate*. San Francisco: Jossey-Bass. - See more at: http://www.nacada.ksu.edu/Resources/Academic-Advising-Today/View-Articles/Undecided-Exploratory-Students-and-Persistence.aspx#sthash.3ogrjUi9.dpuf

Nora, A., & Crisp, G. (2009). Hispanics in higher education: An Overview of research, theory, and practice. *Higher Education : Handbook of Theory and Research*, 24, 317-353. Retrieved from:

http://www.hacu.net/images/hacu/OPAI/H3ERC/2012_papers/Nora%20crisp%20-%20hispanics%20and%20he%20overview%20of%20research_theory_practice%20-%20published%202009.pdf

Nores, M. (2010). Differences in college major choice by citizenship status. Retrived from: *Annals of the American Academy of Political and Social Sciences*, 627 (1), 125-141. http://theop.princeton.edu/reports/wp/ANNALS_Nores_Manuscript_FINAL_(31May09).pdf.

Nota, L. & Soresi, S. (2003). Improving the problem solving and decision-making skills of a high indecision group of young adolescents: A Test of the "Difficult, No Problem" Training. International Journal for Vocational Education, 4, 3-21. doi: 10.1023/B:IJVO.0000021054.81492.8d.

Nunez, A., & Cuccaro-Alamin, S. (1998). *First-generation Students: Undergraduates Whose Parents Never Enrolled in Postsecondary Education*. Washington, DC: U.S. Department of Education, National Center for Education Statistics. Retrieved from: nces.ed.gov/pubs98/98082.pdf.

O'Brien, K. M., Dukstein, R. D., Jackson, R. L., Tomlinson, M. J., & Kamatuka, N. A. (1999). Broadening career horizons for students in at-risk environments. *Career Development Quarterly*, 47, 215-229.

Ochs, L. A. & Roessler, R. T. (2004). Predictors of Career Exploration Intentions: A Social Cognitive Career Theory Perspective. *Rehabilitation Counseling Bulletin*, 47, (4), 224-233.

Olenchak, F. R., & Hebert, T. P. (2002). Endangered academic talent: Lessons learned from gifted first-generation college males. *Journal of College Student Development, 43* (2), 195-212.

Oliverez, P. M., & Tierney, W. G. (2005). *Show Us the Money: Low-Income Students, Families, and Financial Aid.* Center for Higher Education Policy Analysis. Los Angeles: University of Southern California. *Retrieved from:* http://files.eric.ed.gov/fulltext/ED484811.pdf.

Owens, D., Lacey, K., Rawls, G., & Holbert-Quince, K. (2010). First-Generation African American Male College Students: Implications for Career Counselors. *Career Development Quarterly*, 58 (4), 291-300.

Pajares, F. (1996). Assessing self-efficacy beliefs in academic settings. *Review of Educational Research*, 66 (4), 543-578. Retrieved from: http://files.eric.ed.gov/fulltext/ED395264.pdf.

Palmer, R., & Gasman, M. (2008). It takes a village to raise a child: The role of social capital in promoting academic success for African American men at a Black college. *Journal of College Student Development, 49* (1), 52-70. Retrieved from: http://repository.upenn.edu/cgi/viewcontent.cgi?article=1177&context=gse_pubs

Parks, Yancey, R. (2012). Interactions into opportunities: Career management for low-income, first-generation African American college students. *Journal of College Student Development,* 53 (4), 510-523. Retrieved from: *Project MUSE* Web. 28 Sep. 2015. https://muse.jhu.edu/.

Pascarella, E. T. & Pierson, C. T. & Wolniak, G. C. & Terenzini, P. T. (2004). First-Generation College Students: Additional Evidence on College Experiences and Outcomes. *The Journal of Higher Education* 75(3), 249-284.

Parks-Yancy, R. (2012). Interactions into Opportunities: Career Management for Low-Income, First-Generation African American College Students. *Journal of College Student Development*, 53(4), 510-523.

Pascarella, E. T. & Terenzini, P. T. (2005). How college affects students: A Third decade of research (v. 2). San Francisco, CA: Jossey-Bass.

Pascarella, E.T., Pierson, C.T., Wolniak, G.C., Terenzini, P.T. (2004). First-generation college students: Additional evidence on college experiences and outcomes. The *Journal of Higher Education*, 75(3), 249-284.

Patel, S. G., Salahuddin, N. M., & O'Brien, K. M. (2008). Career decision-making self-efficacy of Vietnamese adolescents: The role of acculturation, support, social class, and racism. *Journal of Career Development*, 34, 218-240.

Patton, W., & McMahon, M. (2006). The Systems Theory framework of career development and counseling: Connecting theory and practice. *International Journal for the Advancement of Counseling*, 28 (2), 153-156. Retrieved from: http://eprints.qut.edu.au/2621/1/2621_1.pdf.

Patton, M (1990). *Qualitative Evaluation and Research Methods*. Sage Publications: Newbury Park, California.

Paul, A. M. (2012, April 11). What we can learn from first-generation college students. *Time*. Retrieved from time.com

Paulsen, M. B., & St. John, E. B. (2002). Social class and college cost: Examining the financial nexus between college choice and persistence. *Journal of Higher Education*, 73(3), 189-236.

Pew Research Center. (2014). The rising cost of not going to college. Retrieved from http://www.pewsocialtrends.org/files/2014/02/SDT-higher-ed-FINAL-02-11-2014.pdf.

Peterson, K. F. (2006). *Changing Their Majors: How Do Students Choose Their Majors and Why Do So Many Change?* Doctoral Dissertations, University of Minnesota. Digital Dissertations, UMI 3207663

Peterson, S. L. (1993). Career decision-making self-efficacy and institutional integration of underprepared college students. *Research in Higher Education*, 34 (6), 659-85.

Phinney, J. S., & Haas, K. (2003). The Process of coping among ethnic minority first generation college freshmen: A Narrative approach. *Journal of Social Psychology*, 143 (6), 707-726.

Pijanowski, J. C., & Brady, K. P. (2009). The Influence of Salary in Attracting and Retaining School Leaders. *Education and Urban Society*, *41*(6), 25-41.

Porter, S. R., & Umbach, P. (2006). College major choice: An Analysis of person-environment fit. *Research in Higher Education,* 47 (4), 429-449. Retrieved from: http://stephenporter.org/misc/collegemajorchoice.pdf.

Pryor, J. H., Hurtado, S., DeAngelo, B., Blake, L. P., & Tran, S. (2009*). The American Freshman: National Norms for Fall 2009*. Los Angeles: Higher Education Research Institute, UCLA.

Quimby, J. L., & O'Brien, K. M. (2004). Predictors of student and career decision-making self-efficacy among nontraditional college women. *Career Development Quarterly,* 52, 323-339.

Rajabi, S., Papzan, A., & Zahedi, G. (2012). Application of social cognitive career theory to investigate the effective factors of the career decision-making intention in Iranian agriculture students by using ANN. *SAGE Open*, 2(4), 1-13. doi:10.1177/2158244012467024

Ramos, Y. (2013, March 15). *College students tend to change majors when they find the one they really love.* Retrieved from http://borderzine.com/.

Riklan, M. A. (2014). Resumes and portfolios for new graduates: How to showcase potential. *Career Planning and Adult Development Journal*, 30 (2). Retrieved from: https://www.questia.com/read/1P3-3462611131/resumes-and-portfolios-for-new-graduates-how-to-showcase

Robbins, S. B. (1985). Validity estimates for the Career Decision-Making Self-Efficacy Scale. *Measurement and Evaluation in Counseling and Development*, *18,* 64–71.

Robbins, S. B., Allen, J., Casillas, A., Petterson, C. H., & Le, H. (2006). Unraveling the differential effects of motivational and skills, social, and self-management measures from traditional predictors of college outcomes. *Journal of Educational Psychology*, 98 (3), 598-616. doi: 10.1037/0022-0663.98.3.598

Robst, J. (2007). Education and job match: The Relationship of college major and work. *Economics of Education Review*, 26(4), 397–407. doi:10.1016/j.econedurev.2006.08.003

Rogers, M. E., Creed, P. A., & Glendon, A. I. (2008). The role of personality in adolescent career planning and exploration: A Social cognitive perspective. *Journal of Vocational Behavior*, 73 (1), 132-142.

Rollins, V. B., & Valdez, J. N. (2006). Perceived Racism and Career Self-Efficacy in African American Adolescents. *Journal of Black Psychology*, 32 (2), 176-198.

Royster, D. A. (2003). *Race and the invisible hand: How White networks exclude Black men from blue-collar jobs*. Los Angeles, CA: University of California Press.

Santos, P. J. (2001). Predictors of generalized indecision among Portugese secondary school students. *Journal of Career Assessment*, 9, 381-396.

Schlossberg, N. K. (1989). A Model of analyzing human adaptation to transition. *Counseling Psychologist*, 9 (2), 2-18. Retrieved from: http://tcp.sagepub.com/content/9/2/2.2.full.pdf

Schoon, I., & Parson, S. (2002). Teenage aspirations for future careers and occupational outcomes. *Journal of Vocational Behavior*, 60 (2), 262-288.

Selingo, J. (2012). The rise and fall of the graduation rate. Chronicle of Higher Education. Retrieved from http://chronicle.com/article/The-RiseFall-of-the/131036/.

Serling, D. A., & Betz, N. E. (1993). Development and evaluation of a measure of fear of commitment. *Journal of Career Assessment*, 1 (1), 21-34**.**

Sharf, R. (2002). *Applying career development theory to counseling*. Pacific Grove, CA: Brooks/Cole Thomson Learning.

Sheu, H. B., Lent, L. W., Brown, S. D., Miller, M. J., Hennessey, K. D., & Duffy, R. D. (2010). Testing the choice theory of Social Cognitive Career Theory across Holland themes: A Meta-analytic path analysis. *Journal of Vocational Behavior*, 76, 252-264.

Shivpuri, S., & Schmitt, N., & Oswald, F. L., & Kim, B. H.(2006). Individual differences in academic growth: Do they exist, and can we predict them? *Journal of College Student Development* 47(1), 69-86. The Johns Hopkins University Press. Retrieved October 11, 2015, from Project MUSE database.

Sickles, A.R. (2004). Advising first-generation students. Retrieved from the NACADA Clearinghouse of Academic Advising Resources Web site: http://www.nacada.ksu.edu/Clearinghouse/AdvisingIssues/1st_Generation.htm.

Simon, C. C. (2012, November 2). Major decisions. *New York Times*. Retrieved from http://www.nytimes.com/2012/11/04/education/edlife/choosing-one-college-major-out-of-hundreds.html?pagewanted=1&_r=1.

Slaney, R.B., & Brown, M.T. (1983). Effects of race and socioeconomic status on career choice variables among college men. *Journal of Vocational Behavior, 23,* 257-269.

Slowinski, P. T., & Hammock, W. K. (2003). Undecided/open students. Retrieved from the *NACADA Clearinghouse of Academic Advising Resources* Web site: http://www.nacada.ksu.edu/Resources/Clearinghouse/View-Articles/Advising-Undeclared-Students.aspx.

Smart, J. C., Feldman, K. A., & Ethington, C. A. (2000). *Academic Disciplines: Holland's Theory and the Study of College Students and Faculty*. Nashville, TN: Vanderbilt University Press.

Smith, B. (2007). Accessing social capital through the academic mentoring process. *Equity & Excellence in Education*, 40 (1), 36-46.

Smith, E. (2008). Using secondary data in educational and social science research. British *Journal of Educational Studies*, 56 (3), 323-339.

Smith, C. (2010). Influences in the development of female student athletes pursuing a career in collegiate athletics. Masters Theses. University of Florida.

Smith, J., Pender, M., & Howell, J. (2013). The Full extent of academic under-match. *College Board Advocacy and Policy Center*. Retrieved from: http://www.edpartnerships.org/sites/default/files/events/2013/07/%23106%20Student%20Undermatching.pdf .

Smith, L. M. (2012). Supporting parents in supporting their students: Why including first generation parents in the process is important. *The Mentor (January 12).* Pennsylvania State University: Division of Undergraduate Studies.

Smith, S. S. (2005). Don't put my name on it: Social capital activation and job-finding assistance among the Black urban poor. *American Journal of Sociology*, 111(2), 1-57.

Snyder, T. D., & Dillow, S. A. (2015). Digest of Education Statistics (NCES 2015-011). National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Washington, DC. Digest of Education Statistics (NCES 2010-013). Retrieved from: http://files.eric.ed.gov/fulltext/ED556349.pdf.

Spight, D. (2013, March). Simply declaring a major early equals timely graduation, right? *Academic Advising Today*, *36*(1). Retrieved from:

https://www.nacada.ksu.edu/Resources/Academic-Advising-Today/View-Articles/Simply-Declaring-a-Major-Early-Equals-Timely-Graduation--Right.aspx

St. John, E. (2000). *Majors*. Black Issues In Higher Education, April 13, 21-27.

Staley, R. (2014). *What Major Switching Can Tell Us About Student Outcomes*. Washington, DC: Education Advisory Board.

Stanton, J. M. (1998). An empirical assessment of data collection using the Internet. *Personnel Psychology*, 51 (3), 709–725.

Steele, G.E. (1994). Major-changers: A Special Type of Undecided Student. In *Theoretical and Practical Perspectives on the Undecided Students* (pp. 85-92). ed. V.N. Gordon, Publisher: Freshman Year Experience Program, University of South Carolina Press, Columbia, S.C.

Steele, G. E. (2003). A research-based approach to working with undecided students: A case study illustration. *NACADA Journal*, 1/2, 10-19.

Steele, G. E., & McDonald, M. L. (2008). Moving through college. In *Academic Advising: A Comprehensive Handbook* (2nd ed.) (pp. 157–177). San Francisco, CA: Jossey-Bass.

Stephens, N. M., Markus, S. A., Fryburg, H. R., Johnson, C. S., & Covarrubias, R. (2012). Unseen disadvantage: How American universities focus on independence undermines the academic performance of first-generation college students. *Journal of Personality and Social Psychology*, 102, 1178-1197.

Stieha, V. (2010). Expectations and Experiences: The Voice of a First-Generation First-Year College Student and the Question of Student Persistence. *International Journal of Qualitative Studies in Education (QSE)*, 23 (2), 237-249.

Strayhorn, T. L. (2006). Factors influencing the academic achievement of first-generation college students. *NASPA Journal*, 43, 82-111.

Tang, M. (2003). Intervention implications for school counselors from a SCCT perspective. Retrieved from: //ncda.org/aws/NCDA/pt/sd/news_article/22524/_PARENT/layout_details_cc/false.

Tang, M. (2009, October 10). Intervention implications for school counselors from a scct perspective. Career Convergence Magazine. Retrieved from http://ncda.org/aws/NCDA/pt/sd/news_article/22524/_PARENT/layout_details_cc/false.

Tang M., Fouad N. A., & Smith P. L. *(1999).* Asian Americans' career choices: A path model to examine factors influencing their career choices. *Journal of Vocational Behavior, 54, 142-157.*

Taylor, H. (2000). Does internet research work?: Comparing online survey results with telephone results. *International Journal of Market Research*, 42(1), 51-63.

Taylor, K. M., & Betz, N. E. (1983). Application of self-efficacy theory to the understanding and treatment of career indecision. *Journal of Vocational Behavior*, 22 (1), 63-81.

Taylor, K.M., & Popma, J. (1990). An examination of the relationship among career decision-making, self-efficacy, career salience, locus of control, and vocational indecision. *Journal of Vocational Behavior*, 37(1), 17-31.

Thayer, P. B. (2000, May). Retention of students from first generation and low income backgrounds. *Opportunity Outlook*, 2–8. ERIC ED446633. Retrieved from http://etd.ohiolink.edu/send-pdf.cgi

Theophilides, C., Terenzini, P.T., & Lorang, W. (1984). Freshmen and sophomore experience and changes in major. *Review of Higher Education*, 7(3), 261-278.

Ting, S. M. (2003). A longitudinal study of non-cognitive variables in predicting academic success of first-generation college students. *College and University*, 78(4), 27-31.

Titley, R.W., & Titley, B.S. (1980). Initial choice of college major: Are only the "undecided" undecided? *Journal of College Student Personnel*, 21, 293-298

Tracey, T. J., & Robbins, S. B. (2006). The interest-major congruence and college success relation: A longitudinal study. *Journal of Vocational Behavior*, 69, 64–89.

Tym, C., Micmillion, S., Barone, S., & Webster, J. (2004). First generation college students: A Literature Review. *TG Research and Analytical Services.* Retrieved from: http://www.tgslc.org/pdf/first_generation.pdf.

Tyson, C. (2014, September 10). The 'murky middle'. Retrieved from Inside Higher ED website: https://www.insidehighered.com/news/2014/09/10/maximize-graduation-rates-colleges-should-focus-middle-range-students-research-shows.

United States Census Bureau (2012). *U.S. Census Bureau Projections Show a Slower Growing, Older, More Diverse Nation a Half Century From Now*. Retrieved from U.S. Census Bureau website: http://www.census.gov/newsroom/releases/archives/population/cb12-243.html.

United States Census Bureau (2014). United States population projections: 2014-2060. Retrieved from U. S. Census Bureau website: http://www.census.gov/newsroom/press-releases/2014/cb14-tps86.html.

U.S. Department Of Education, National Center For Statistics. (1999). *The pocket condition of education 1999 NCES.* Retrieved from http://nces.ed.gov/pubs2000/2000024.pdf.

Uwah, C., McMahon, H. G., & Furlowe, C. F. (2008). School belonging, educational aspirations, and academic self-efficacy among African American male high-school students: Implications for school counselors. *Professional School Counseling*, 11 (5), 296-305.

Vargas, J. H. (2004). *College Knowledge: Addressing Information Barriers to College*. Boston, MA: Education Resources Institute.

Varney, J. (2012, September). Proactive (Intrusive) advising! *Academic Advising Today, 35* (3). Retrieved from: https://www.nacada.ksu.edu/Resources/Academic-Advising-Today/View-Articles/Proactive-(Intrusive)-Advising!.aspx

Vilorio, D. (2014). STEM 101: Introduction to tomorrow's jobs. *Occupational Outlook Quarterly*, Spring, 1-12. Retrieved from: http://www.bls.gov/careeroutlook/2014/spring/art01.pdf.

Vuong, M., & Brown-Welty, S. & Tracz, S. (2010). The Effects of self-efficacy on academic success of first-generation college sophomore students. *Journal of College Student Development* 51(1), 50-64. Retrieved October 13, 2015, from Project MUSE database.

Walsh, W.B. & Savikas, M.L. (2005). *Handbook of Vocational Psychology* (3rd ed.). New Jersey: Lawrence Erlbaum Associates Inc.

Wang, C.C. D., & Castañeda-Sound, C. (2008). The Role of generational status, self-esteem, academic self-efficacy, and perceived social support in college students' psychological well-being. *Journal of College Counseling*, 11, 101–118. doi: 10.1002/j.2161-1882.2008.tb00028.x

Warmsley, W., Wilson, W., & Morgan, M. (2010). Influences on a college student's major choice: A Developmental perspective. *Journal of Liberal Arts and Sciences,* 14 (2), 25-46. Retrieved from: file:///C:/Users/cfmclean/Downloads/JLAS_SP10_Walmsley_Wilson_Morgan_4.pdf.

Weinstein, F. M., Healy, C. C., & Ender, P.B. (2002). Career choice anxiety, coping, and perceived control. *Career Development Quarterly*, 50 (4), 339-49.

Wessels, S., & Sumner, D. (2014). Integrating career development into the accounting curriculum. *American Journal Of Business Education (AJBE), 7*(1), 21-30. Retrieved from http://www.cluteinstitute.com/ojs/index.php/AJBE/article/view/8316.

Whiston, S. C., & Keller, B. K. (2004). The influence of the family of the origin on career development: A review and analysis. *The Counseling Psychology*, 32, 493-568.

Wiljanen, L. (2003, September 01). Career development of first-generation college students: Pioneers in our high schools. Retrieved from: Pttp://ncda.org/aws/ncda/pt/sd/news_article/4754/_parent/layout_details_cc/false#sth.

Willingham, W. W. 1985. Success in College: The Role of Personal Qualities and Academic Ability. *Career Convergence Magazine*. Retrieved from http://ncda.org/.

Wiswall, M., & Zafar, B. (2014). *Determinants of College Major Choice:*. New York, NY: Federal Reserve Bank of New York . Retrieved from http://www.newyorkfed.org/research/staff_reports/sr500.pdf.

Wood, K. L. (2012). *Factors Influencing Career Decision-making for First Generation Appalachian Students*. Theses, Dissertations, and Capstones, Paper 226. Retrieved from Marshall Digital Scholar.

Wright, K. B. (2006). Researching internet-based populations: Advantages and disadvantages of online survey research, online questionnaire authoring software packages, and web survey services. *Journal of Computer-Mediated Communication*, 10(3). doi:10.1111/j.1083-6101.2005.tb00259.x

Wright, S. L., Jenkins-Guarnieri, M. A., & Murdock, J. L. (2013). Career development among first-year college students: College self-efficacy, student persistence, and academic success. *Journal of Career Development*, 40, 292-310. doi:10.1177/0894845312455509

Xu, Y. J. (2013). Career outcomes of STEM and non-STEM college graduates: Persistence in majored-field and influential factors in career choices. *Research in Higher Education*, 54 (3), 349-382.

Appendix

Appendix A IRB Approval

NORTH CAROLINA STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD FOR THE USE OF HUMAN SUBJECTS IN RESEARCH
SUBMISSION FOR NEW STUDIES

Protocol Number 5702

Project Title

An Examination of the Impact of Major Changing Patterns on the Academic Performance and Career Decision-Making Self-Efficacy of First Generation College Students

IRB File Number:

Original Approval Date:

04/20/2015

Approval Period

04/20/2015 - 04/20/2016

Source of funding (If externally funded, enter PINS or RADAR number of funding proposal via 'Add New Sponsored Project Record' button below):

no external funding

NCSU Faculty point of contact for this protocol:NB: only this person has authority to submit the protocol

Ting, Siu-Man Raymond: Curriculum, Instruction and Counselor Education

Does any investigator associated with this project have a significant financial interest in, or other conflict of interest involving, the sponsor of this project? (Answer No if this project is not sponsored)

No

Is this conflict managed with a written management plan, and is the management plan being properly followed?

No

Preliminary Review Determination

Category:

Expedited 5,7

Provide a brief synopsis of the study (limit text to 1500 characters)

The purpose of this study is to determine differences in major changing patterns and career decision-making self-efficacy between first generation college students and their peers who are not first generation, and to determine how changing majors impacts a student's career decision making self- efficacy and academic performance in college. This study will focus on the following questions: 1. What are the differences in the levels of career decision-making self-efficacy scores between first generation college students (FGCS) and other college students? 2. What are the differences in the GPA of FGCS who changed their major 0, 1, 2, and 3 or more times? 3. What are the differences in the levels of career decision-making self-efficacy scores between first-generation college students who change their majors 0, 1, 2 and 3 or more times?

Briefly describe in lay language the purpose of the proposed research and why it is important.

The ultimate goal of this research is to gain a better understanding of the career decision-making needs of first generation college students (FGCS) (particularly those who are redeciding) in hopes of informing the development of career exploration programs, activities, and college infrastructure which increase the likelihood that redeciding FGCS will persist to graduation and reduce time to degree.

Is this research being conducted by a student?

Yes

Is this research for a thesis?

No

Is this research for a dissertation?

Yes

Is this independent research?

Yes

Is this research for a course?

No

Do you currently intend to use the data for any purpose beyond the fulfillment of the class assignment?

Appendix B Invitation to Participate

IRB Review Team:

This will be an electronic request sent to students via email. If they agree to participate they will be linked to the demographic survey and then to the survey tool. The informed consent document precedes this request when the request to participate goes out to students.

Dear Student:

I am currently a doctoral candidate in the department of Counselor Education here at North Carolina State University. I am conducting a study to determine how changing one's major impacts a student's career decision-making self-efficacy and academic performance. I request your participation in the study described below. If you agree to participate in the study please read the description and submit the consent form below. Then continue to the weblink to take the survey. It is estimated that participation in this research will take approximately 15 minutes of your time. Thank you in advance for your consideration and participation.

Appendix C Informed Consent

North Carolina State University
INFORMED CONSENT FORM for RESEARCH
This consent information is valid 4/20/2015 through 4/20/2016

Title of Study
An Examination of the Impact of Major Changing Patterns on the Academic Performance and Career Decision-Making Self-Efficacy of First Generation College Students

Principal Investigator
Carrie Frederick McLean

Faculty Sponsor (if applicable)
Dr. Raymond Ting

What are some general things you should know about research studies?
You are being asked to take part in a research study. Your participation in this study is voluntary. You have the right to be a part of this study, to choose not to participate or to stop participating at any time without penalty. The purpose of research studies is to gain a better understanding of a certain topic or issue. You are not guaranteed any personal benefits from being in a study. Research studies also may pose risks to those that participate. In this consent form you will find specific details about the research in which you are being asked to participate. If you do not understand something in this form it is your right to ask the researcher for clarification or more information. A copy of this consent form will be provided to you. If at any time you have questions about your participation, do not hesitate to contact the researcher(s) named above.

What is the purpose of this study?
The purpose of this study is to determine differences in major changing patterns and career decision-making self-efficacy among first generation college students at NC State University and to determine how changing majors impacts these students' career decision making self- efficacy and academic performance in college.

What will happen if you take part in the study?
If you agree to participate in the study you will be prompted to submit the Informed Consent and print a copy of the form for your personal file if you desire to do so. You will also be asked to complete a short demographic questionnaire that should take 3- 5 minutes to complete

When the demographic questionnaire has been completed you will be directed to another secure link to connect to the Career Decision-Making Self-Efficacy Scale- Short Form (CDSE-SF) that will be hosted on the Mindgarten.com website. Mindgarten.com is the company from which the surveys are purchased. Mindgarten will administer and score the surveys. The producer estimates that the CDSE-SF will take about 10 minutes to complete. Participation in the entire research process should take about 15 minutes of your time. Please remember to click the icon to submit your results if you choose to participate in the study.

Your consent information is linked to your student identification number. The Principal Investigator will use this student identification number to match the demographic survey results and the CDSE-SF results to a University dataset that will be requested from the Office of Institutional Research and Planning (OIRP). The University dataset that will be requested from OIRP will include student identification number, email address, age, gender, ethnicity, number of major changes, semester of major change, first generation college status, and total number of credit hours completed. Once all this data has been matched for analysis the Principal Investigator will assign a numeric code to each participant and refrain from using the student identification number. The numeric code list will be stored in a locked file in the Principal Investigator's University office. The numeric code list and the coded dataset will be stored in separate locked files to protect the participant's confidentiality.

Once the survey closes, all participants who completed and submitted the surveys (CDSE-SF and demographic survey) student identification numbers will be entered into a random drawing for a $50.00 gift certificate. The winner of the gift certificate will be notified of their winning via email.

Once the study is completed and has been approved by the Principal Investigator's Faculty Research Committee, any participant who is interested in receiving a summary of the results should email the Principal Investigator.

Risks
This study carries limited risks, if any, similar to those inherent in most educational research studies. The self-report survey is designed to be non-threatening and minimal discomfort is expected from participating in this research study. However, some participants may feel discomfort in responding to the questions on the survey. If you should at any time feel discomfort or distress

Appendix D Demographic Survey

ID number ______________________

DEMOGRAHIC SURVEY

1. Age
   a. 17 or younger
   b. 18 -22
   c. 23-25
   d. 26 or older
2. Sex
   a. Female
   b. Male
3. Race
   a. African American or Black
   b. Asian
   c. Hispanic or Latino
   d. White American (non-Hispanic)
   e. Multiracial
   f. Other : self-identify ______________
4. Grade point average
   a. Below 2.0
   b. 2.0 – 2.59
   c. 2.6 -2.99
   d. 3.0-3.59
   e. 3.6-4.0 or above
5. Total number of credit hours completed
   a. Below 30
   b. 30 – 44
   c. 45-59
   d. 60-74
   e. 74-89
   f. 90 or more

Appendix E Career Decision-making Self-efficacy Scale - Short Form

Score: ______________

Please provide the following information:

Name or I.D.____

Date _______________ Age _______________ Gender (*Please Circle*): **F M**

Career Decision Self-Efficacy Scale Short Form

INSTRUCTIONS: For each statement below, please read carefully and indicate how much confidence you have that you could accomplish each of these tasks by marking your answer according to the following 5-point continuum. Mark your answer by filling in the correct circle on the answer sheet.

Example:

No Confidence at All	**Very Little Confidence**	**Moderate Confidence**	**Much Confidence**	**Complete Confidence**
1	2	3	4	5

How Much Confidence Do You Have That You Could:

	1	2	3	4	5
a. Summarize the skills you have developed in the jobs you have held?	○	○	○	○	●

If your response on the 5 point continuum was 5, "Complete Confidence", you would fill in the number 5 on the answer sheet.