

THE RELATIONSHIPS OF SELECTED CURRICULUM PROGRAM AREAS ON
CREDENTIAL ATTAINMENT OF AFRICAN AMERICAN MALES ENROLLED IN THE
NORTH CAROLINA COMMUNITY COLLEGE SYSTEM

A Dissertation
by
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ABSTRACT

THE RELATIONSHIPS OF SELECTED CURRICULUM PROGRAM AREAS ON CREDENTIAL ATTAINMENT OF AFRICAN AMERICAN MALES ENROLLED IN THE NORTH CAROLINA COMMUNITY COLLEGE SYSTEM. (August 2012)

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African American men are not being successful at any level of education. This study explores the differences in credential attainment for African American male students enrolled in selected programs of study in the North Carolina Community College System (NCCCS). In addition, this study describes the relationship between the credential attainment rates of African American males and students not identified as African American males. Tinto's (1993) research describing student persistence behavior provides the theoretical framework for this study. The selection of an academic program of study may provide both social and academic integration for community college students. A quantitative study of North Carolina community college students from 58 community colleges was conducted to gain a deeper understanding of student program of study selection on credential attainment rates for African American males. Additionally this study compared African American male credential attainment rates with completion rates for African American females, white males and white females.

The results of this study indicate that African American males who began their enrollment in fall 2005 are most likely to earn a credential in a CIP area code in Business and least likely to earn a credential in a program of study from the Arts/Sciences CIP code area. When compared to other students in the sample, African American males are less likely to earn a credential from North Carolina community colleges than African American females, white males, or white females.

This study identifies credential attainment gaps between African American males and African American females, African American males and white males, and African American males and white females. The largest credential attainment gap exists between African American males and white females.

The study also identifies implications for academic advisors, faculty, and college policy, and suggests that colleges develop customized programs and encourage faculty from CIP code areas to share practices and to work collaboratively to increase credential attainment for African American males.

The study ends with suggestions for future research that further explores African American male credential attainment by CIP code areas.

DEDICATION

This study is dedicated to my mother, Helen Holder Wilson, and my father, Calvin Van Wilson—two of the smartest and most beautiful people that I have ever known. This research is also dedicated to my two nephews—Calvin Douglas Wilson and Mitchell Woodrow Wilson. I encourage them to fight the odds and never to be limited by the expectations of others.

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Chapter One: Introduction

This chapter provides an introduction to the challenges faced by African American males enrolled in postsecondary education. Poor participation, persistence, and attainment rates plague African American males who have pursued postsecondary education. The chapter also includes a discussion of the problem: an educational credential attainment gap, and the difference in the numbers of students persisting to credential attainment that exists among various student populations. When African American males do not obtain a postsecondary credential, there are significant costs to both the student and society. This study draws from the work of Tinto's (1993) student integration model as its theoretical framework. This introductory chapter presents a purpose statement for this research, provides research questions, and discusses the significance of studying the attainment rates for African American males enrolled in North Carolina community colleges. Finally, the chapter concludes with an explanation of why this study is of interest and includes a section defining terminology used in the study.

African American males enrolled in colleges and universities in America are in crisis. Their college success and degree attainment are of concern to many scholars in higher education (Schmidt, 2008). When compared to other ethnic, racial, and gender groups, African American males lag behind in almost all categories in educational and economic attainment (Garibaldi, 2007; Smith & Fleming, 2006). This lack of educational attainment leaves African American males in a precarious position. Without a postsecondary education, the ability of African American men to fully participate in American society is significantly

limited (Bailey, 2003). “There are limitless benefits and gains that come with a college degree. To begin with, a college education allows both social and economic access that is typically not afforded to individuals who are noncollege graduates” (Owens, Lacey, Rawls, & Holbert-Quince, 2010, p. 291). African American men without college degrees are less likely to be employed and more likely to become incarcerated than men of other ethnic groups (Petit & Western, 2004). Of the African American men born between 1965 and 1969, 30% of those without a college education and 60% of those without a high school diploma spend some time in jail or in prison. According to Petit and Western (2004), in 2002 approximately 12% of African American men in their twenties were incarcerated. In 2000, the number of African American men involved in the penal system exceeded the number of African American men participating in postsecondary education. In 2000, 791,600 African American men were incarcerated or engaged in the criminal justice system, whereas 603,032 African American men were enrolled in an institution of higher education (United States Census Bureau, 2000). While African American men are underrepresented in higher education, they are overrepresented in the penal system. In 2004, African American men between the ages of 15-29 make up 14% of all men in the United States (See Figure 1.1). While making up 14% of the U.S. population, only 8% of African American men have earned college degrees (United States Census Bureau, 2000).

According to Scott Ralls (2008), President of the North Carolina Community College System, in 2007 there were 4,000 more African American males in North Carolina prisons than were enrolled in North Carolina community colleges during the 2006 -2007 academic year. In addition to the disproportionate numbers of African American males who were incarcerated, there is an inequity in the U.S. prison-going rates between men who

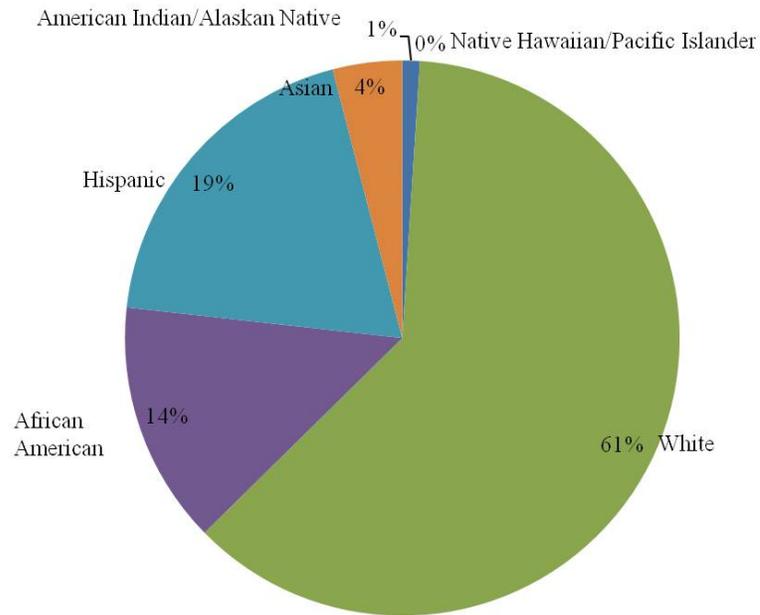


Figure 1.1. Percent of U.S. men ages 15 to 29 identified by race/ethnicity in 2004. Adapted from Table 4: Annual Estimates of the Population by Age, Sex, Race, and Hispanic origin for the United States; April 1, 2000-July 1 2005 (NC-EST2005-04) Population Division, U.S. Census Bureau.

were college educated versus men with a high school degree. Men with a high school diploma are twice as likely to go to prison as men who were college educated (Petit & Western, 2004). To exacerbate matters, a difficult economy worsens the social and economic problems for African American men. An opinion published in *USA Today* states that socially the cost of African American boys not completing high school is astronomical. Of the African American males lacking a high school diploma, 20% serve time in the penal system (USA Today, 2009).

Poor academic performance by African American male students in school is magnified by the fact that African American women with similar cultural and academic

backgrounds are performing significantly better than their male counterparts. The data show African American women are enrolling in and obtaining college degrees at a rate that is twice that of their African American male peers. In 2003, there were 579,492 more African American women enrolled in postsecondary education than African American men (Garibaldi, 2007). According to Chappell (2007), the ratio of women to men graduating from college is 133 to 100. However, when comparing the same data among the African American men and women—where already less than 18% of adults above the age of 25 have completed a four-year college education—twice as many African American women graduate from college than African American men. The two-to-one degree-attainment ratio between African American women and men is the highest of any racial or ethnic group. This credential attainment gap—the difference between the rates of credential attainment between two populations—for these two cohorts of students exists at the associate, bachelor’s and master’s degree levels (KewalRamani, Gilbertson, Fox, & Provasnik, 2007). The obstacles confronting African American men in education are well documented. African American boys and men face difficulties in education by experiencing higher attrition rates, lower student persistence rates, and lower graduation rates (Schmidt, 2008). Using current high school trends to project future participation rates of African American males in postsecondary education indicates a dire tomorrow for African American men. According to Holzman (2010):

The unacceptably low high school graduation rate of Black male students condemns them to a lifetime of below average earnings. Projecting present trends...provides a dismal picture of increasing educational disparities, damaging the overall potential of the American economy and American society and continuing to limit the life chances

of seceding generations of our country's Black male citizens (p. 36).

In 1967, half of households led by high school dropouts and 70% of high school graduates were able to gain access to the middle class. By 2003, 33% of high school dropouts and 50% of high school graduates could reach the same economic status (Uhalde, Strohl, & Simkins, 2006).

Studying the credential attainment gap for African American male college students is important for multiple reasons: economic and workforce development opportunities; assisting African American male students by developing tools to support their academic success; dealing with social issues such as marrying African American women that have obtained college credentials; the strengthening of the African American community by increasing intellectual capital; informing institutions of higher education about African American male student persistence; creating professional development tools for community college faculty, staff, administrators, and students; and increasing awareness of African American persistence for educational policy makers.

Community colleges play a pivotal role in providing access to students, particularly African American men. However, too many students of color who enroll in community colleges to pursue a postsecondary credential leave without obtaining a college certificate, diploma, or degree (Gardenhire-Crooks, Collado, Martin, & Castro, 2010).

Community colleges must do more to increase the number of African American men that earn a postsecondary credential and decrease the educational attainment gap between African American male community college students and other community college students. Increasing the academic success of these students helps society by empowering individuals to contribute resources to society rather than draining resources away (MCD, 2007.)

When controlling for individual factors such as ethnicity, social economic status, and test scores, community colleges with larger minority enrollments have lower student graduation rates. These findings warrant additional study (Calcagno, Bailey, Jenkins, Kienzl, & Leinbach, 2008).

The African American community already lags behind its white peers in college attainment and other social economic measures. The level of poverty, crime rates, and earning potential is impacted by the lack of educational attainment by some lesser fraction for non-minorities. Without college degrees, the post-baby boomers may not be able to access employment opportunities: "...individuals with college-level skills may be in short supply, which may in turn severely limit individual opportunity and erode economic growth" (Callan, 2006, p. 10). Kaba states that "The types of degrees awarded to any group of students most often determine their role in the economic, political, and social structures within their society and the world" (2005, p. 3).

The American community college system, of which the North Carolina Community College System is a subset, enrolls a large number of underprepared and underrepresented students, with its open door admissions policy (Mellow & Heelan, 2008). The community college may be the only opportunity for African American men to access postsecondary education. According to Bush and Bush:

However, community colleges lack the incentive to examine academic outcomes by race in meaningful ways. In other words there are no political acts or laws demanding any level of student achievement outcomes nor are there any threats to the institution's funding sources based on their inability to produce equitable outcomes. (2005, p. 44)

In 2009-2010, the most current enrollment period for which there is official enrollment data for the North Carolina Community College System, North Carolina community colleges enrolled 847,165 students. There were 334,860 students enrolled in certificate, diploma, degree, or college transfer programs. Of these students, 19,529 were enrolled in associate degree programs, 10,403 in certificate programs, and 4,388 in programs leading to a diploma (Appendix A). Of the community college students enrolled in certificate, diploma, or degree programs in 2009, only 29,782 students identified themselves as an African American male. Many of these students are first-generation college students (S.Yim, personal communication, November 3, 2008). However, according to W. Schneider, Associate Vice President for Research and Performance Management at the North Carolina Community College System from July 1, 2009 to June 30, 2010, only 2,156 African American males graduated from North Carolina community colleges. This number is a duplicated student head count by degree type (150 African American male students graduated with multiple degree types). There were 1,207 certificates, 333 diplomas, and 770 associate degrees awarded to African American male students enrolled in North Carolina community colleges during the 2009-2010 academic year (W. Schneider, personal communication, May 10, 2011).

Problem Statement

In spite of the need to complete high school or attend some form of postsecondary education, statistics indicate that educational attainment is not a reality for some students, particularly African American males (United States Census Bureau, 2000). As stated by Greene, Marti, and McClenny (2008):

One of the most unrelenting challenges confronting higher education is a

participation and achievement gap between ethnic groups. For example, U.S. Census Bureau data indicate 60.6% of Asian and 42.8% of white, compared to 32.7% of African American and 24.8% of Hispanic, 18- to-24 year-olds were enrolled in degree-granting institutions in 2005. (p. 514)

Of these students, only 7.9% of African American students who began their enrollment at the community college level had earned their two-year degree within six years, while 17% of white students in the same cohort had earned at least an associate degree (Greene et al., 2008). In 2005, 77.4% of African American men between the ages of 18-29 were high school graduates; only 7.5% of African American men in the same age group obtained any type of postsecondary credential. White men with high school diplomas totaled 85.5%, and 17.3% had college degrees when compared to African American men in the same age group (Figure 1.2).

If the United States is to regain its position atop the global market, it must produce a greater number of students who earn a postsecondary educational credential (Mathis, 2010). According to Achieving The Dream, a national initiative to support community college student success:

Community colleges offer broad access to higher education through open admissions. When their students succeed, the benefits are far reaching. Community colleges educate new workers so our nation can stay competitive, and they retrain current workers to address evolving jobs or circumstances. (MCD, 2007, p. 1)

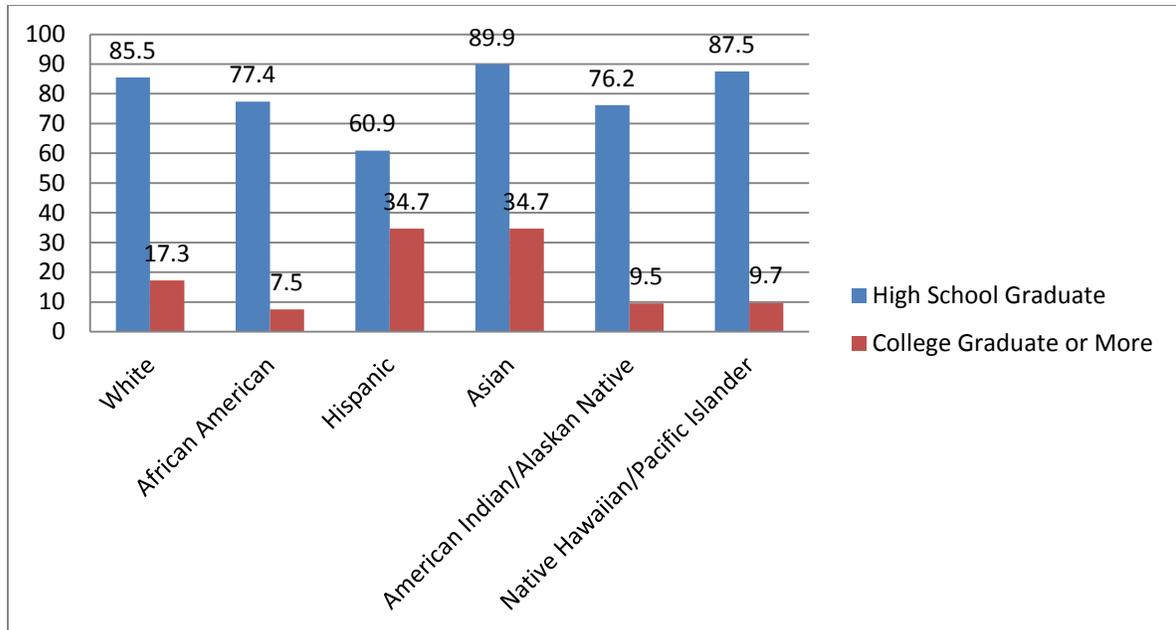


Figure 1.2. The educational attainment of men ages 18 to 29 identified by race/ethnicity for the year 2005. Showing the percentage of men who within the 18-29 age group who are either high school or college graduates. Adapted using U.S. Census Bureau Current Population Survey Table Creator (cited on July 5, 2006).

Scott Ralls, President of the North Carolina Community College System, says that by 2018 there will be 30 million jobs that will require some postsecondary education, but not necessarily a four-year bachelor's degree. In 2007, 59% of the jobs in the workforce required some education beyond high school. By the year 2018 this will increase to 62% of all jobs. The community college will produce a larger number of credentialed students to fill these jobs than the four-year colleges and universities (Driscoll, 2007; Ralls, 2010). To meet these increasing demands for a credentialed workforce, institutions of higher education must become better prepared to provide support services and professional development for faculty and staff to teach and support a more diverse student population (Mathis, 2010).

The numbers of African American men prepared to enter the next level of the

educational pipeline begins to decrease with African American boys enrolled in middle school, and continues to decrease from high school to graduate school (Holzman, 2010). Increasing the number of African American men with college degrees, narrowing the degree attainment gap between African American men, African American women, and other student groups, and reducing crime and incarceration rates of African American men all provide significant challenges for primary, secondary, and postsecondary education. Thus, it is important to study the credential attainment gap as it relates to curriculum program area enrollment on the certificate, diploma, or degree attainment of African American males in the North Carolina Community College System.

The President of the United States, Barack Obama, has challenged the higher education community to increase the number of U.S. degrees earned by five million before the year 2020 (Mellow & Heelan, 2008). Field notes that:

Nationwide some 101.5 million adults over the age of 18 – a full 45% of Americans – have never attended college, according to the Census Bureau. If each of them took a year’s worth of college courses their earnings would grow by \$70-billion... (2009, p. A16)

Attending college for two years can make a significant difference in an individual’s earning potential. High school graduates with no college earn 12% less than student with an associate degree and some college, and 63% less than individuals with a bachelor’s degree (Field, 2009).

The American Association of Community Colleges (AACC) has signed on as a supporter of President Obama’s initiative. In doing so, the AACC has agreed to move its agenda away from addressing issues of just college access to an agenda of a culture that

supports student access and success. Barriers and practices that create attainment gaps for students based on race, income, and ethnicity must be identified and eliminated (McPhail, 2011). Holzman states:

Recognizing that increasing the number of Americans with college credentials is a necessity for America to be globally competitive in the 21st century, President Barack Obama set as a national goal to become a global leader in post-secondary attainment by 2020. *Yes We Can, The Schott 50 State Report on Public Education and Black Males*, starkly illustrates that only 47% of Black males graduate from high school—far short of the trajectory and post secondary credentials needed for our nation to be globally competitive by the year 2020. It indicates that systemic disparities evident by race, social class, of zip code [sic] are influenced more by social policies and practices that WE put in place to distribute educational opportunities and resources and less by the abilities of Black males. (2010, p. 1)

The small number of African American men persisting to college credential attainment, the increased demand for a skilled work force with at least two years of college, and the credential attainment gap between different student gender and ethnic groups makes this research project of interest.

Research Questions

This persistence study examined two questions. First, the study examined African American male credential attainment in the North Carolina community college system by addressing this question: What is the relationship between the curriculum program area selected and credential attainment for African American males in the North Carolina

Community College System? Additional sub-questions addressed were:

- What is the attainment rate for African American male students enrolled in the Arts and Sciences curriculum area?
- What is the attainment rate for African American male students enrolled in Business Technologies curriculum area?
- What is the attainment rate for African American male students enrolled in the Engineering Technologies curriculum area?
- What is the attainment rate for African American male students enrolled in the Health Sciences curriculum area?

The second research question guiding this study was: What is the relationship between the credential attainment rates for African American males relative to other selected student groups not classified as African American males? Additional sub-questions addressed were:

- What is the relationship between the credential attainment rate of African American men and African American women in the Arts and Sciences, Business Technologies, Engineering Technologies, and Health Sciences curriculum areas?
- What is the relationship between the credential attainment rate of African American males and white males in the Arts and Sciences, Business Technologies, Engineering Technologies, and Health Sciences curriculum area?
- What is the relationship between the credential attainment rate of African American males and white females in the Arts and Sciences, Business

Technologies, Engineering Technologies, and Health Sciences curriculum area?

Student Group	Curriculum Program Area				
	Arts and Sciences	Business Technologies	Engineering Technologies	Health Sciences	
	Research Question #1	→			Research Question #2
AA Male					↓
AA Female					
W Male					
W Female					
W = White	AA = African American				

Completion Rates

Figure 1.3. Study Matrix showing the order in which the study was conducted. AA = African American. W = White.

Methodology

The research employed correlational statistical analysis to evaluate historical data contained in North Carolina’s statewide community college database. This quantitative study replicated the approach used by other researchers (Bers, 1988; Leppel, 2001; Simpson, 1987) to study the phenomenology of community college student persistence. The study used propensity scores to account for multicollinearity introduced by the relative size differences in the cells and the possibility of the relationships among the independent variables and the effect on the dependent variable of credential completion.

Significance of the Issue

This study will contribute to the body of knowledge available in the field of higher education, especially in North Carolina and the North Carolina Community College System.

Most research on student persistence has several limitations, such as being conducted using students from a single college or tracking student behaviors for a short span of time (Pascarella, Smart, & Ehtington, 1986). This study addressed some of the shortcomings found in current research—the use of data from a single community college and of time—by examining data from a large community college system consisting of 58 institutions. The North Carolina Community College System contains institutions with multiple enrollment sizes and types (large, small, urban, suburban, and rural), as well as differing race, ethnic, and gender compositions. The study addressed the research issues regarding time by examining student credential attainment data over a six-year period. The six-year time frame was selected because it is significantly beyond the award period for student federal financial aid (150% of length of time to degree attainment, which is three years for a two-year degree) and is consistent with similar persistence studies previously completed (Bers, 1998; Leppel, 2001; Simpson, 1987).

The purpose of this study was to determine if curriculum program area selection impacts diploma, certificate, or degree attainment for African American males enrolled in one of four curriculum program areas—Arts and Sciences, Business Technologies, Engineering Technologies, and Health Sciences—in the North Carolina Community College System. Additionally, this study determined the relationship between the credential attainment rates for African American males relative to other selected student groups not classified as African American males. As a result this study may provide community college students, presidents, faculty, community college student service administrators, career counselors, and community college policy makers with information regarding the relationship between African American male curriculum program area and their persistence

to degree attainment. Felderman (1993) states:

Administrators, faculty, and counselors should be aware of these factors so that greater sensitivity, new program configurations, and improved services can be offered to students who may be at risk. If the college community in general can become more responsive to students whose characteristics include one or more of these factors, attrition rates may decline. (p. 512)

Ester and Mosby (2007) concluded:

What is most alarming about the current state of the Black male on America's community college campuses is that those who are in positions of leadership have been slow to recognize the situation as a state of emergency and have been almost reluctant to own up to their responsibility to take corrective action. (p. 45)

The results of this study may be used to inform future studies in postsecondary student persistence by identifying successful North Carolina community college curriculum programs areas that have greater persistence to degree attainment rates and graduate larger numbers of African American males. Future studies may identify best practices from successful programs that could be documented and disseminated to other community colleges that may improve persistence, degree attainment, and attainment rates for all students.

Failure to study credential attainment of African American males enrolled in North Carolina community colleges will result in America continuing to fall further behind in its ability to produce enough degree recipients to meet the job demands of the future (Ralls, 2010). Greene, Marti, and McClenney (2008) in their study of student success and engagement conclude it is important to better understand the relationship between student

engagement and educational outcomes for students attending community colleges, particularly in regard to identification of the educational practices that matter most to improving the probability of the success of African American, Hispanic, and other underprepared and underrepresented students involved in postsecondary education at the community college. Additional research in this area of student success should continue to focus on the changeable conditions that surround learning, exploring in detail the alterable student and institutional characteristics that demonstrate the greatest potential for enhancing student engagement and success.

Definition of Terms

African American Male. This study used the term African American to identify a cohort of students who identify themselves as having origin in any of the races coming out of the African continent (U.S. Department of Education National Center for Education Statistics [NCES], 2010). Students self-report their race and ethnicity in the admissions process via the college's admissions application. This self-reported data is imported into the statewide community college database (NCCCS Data Warehouse) annually.

Classification of Instructional Program Code. Classification of Instructional Program Code (CIP) is the second and third digits of a student's thirteen-digit curriculum code. According to the U.S. Department of Education's National Center for Education Statistics:

The Classification of Instructional Programs (CIP) provides a taxonomic scheme that supports the accurate tracking and reporting of fields of study and program completions activity. CIP was originally developed by the U.S. Department of Education's National Center for Education Statistics (NCES)

in 1980, with revisions occurring in 1985, 1990, and 2000.

The 13 CIP categories are: Arts and Sciences, Associate in General Education, Agriculture and Natural Resources Technologies, Biological and Chemical Technologies, Business Technologies, Commercial/Artistic Production Technologies, Construction Technologies, Engineering Technologies, Health Sciences, Industrial Technologies, Public Service Technologies, Transport Systems Technologies, and Special Registration Categories. All students that meet the established selection criteria and who are enrolled in programs of study with CIP codes in the areas of Arts and Sciences, Business Technologies, Engineering Technologies, and Health Sciences were selected for this study. The four CIP codes were selected for this study because they align with the academic divisions or schools at most of the North Carolina community colleges. Additionally, the areas were selected to provide consistency with other community college persistence studies. Lappel (2001) studied students in the areas of business, engineering, education, health, undecided, and arts and sciences. North Carolina community colleges do not offer undecided as a program of study option.

Degree Attainment. This study used the term degree attainment to describe a student who has completed the requirements for an associate degree, a diploma, or a certificate from one of the 58 constituent community colleges of the North Carolina Community College System. An associate degree program is a planned academic curriculum program that terminates at the community college leading to an Associate in Arts (A.A.), Associate in Fine Arts (A.F.A.), Associate in Science (A.S.), or an Associate in Applied Science (A.A.S) degree. A certificate is a short-term program that is usually one year in length (12 to 18

semester hours) and designed for entry-level job training. Diploma programs are also developed for entry-level job training but longer than certificate programs. Diploma programs are 36 to 48 semester hours in length (NCCCS, 2012).

Minority Male. This study used the term minority male to describe any male student excluding those of white (Caucasian) or Asian ancestry. Asian students were excluded because academically they outperform their peers from other race and ethnic backgrounds.

North Carolina Community College System (NCCCS) Data Warehouse. The NCCCS Data Warehouse (state funded) is an information database that is designed to give individuals access to North Carolina state-level information about community college students. The NCCCS Data Warehouse contains information regarding student enrollment, bio-demographic information, academic performance, student persistence, and degree attainment information from all 58 of North Carolina's community colleges (K. Brown, personal communication, November 3, 2009). Information is electronically transferred from each of the 58 North Carolina community colleges annually.

North Carolina Community College System. Founded in 1963, the North Carolina Community College System (previously the North Carolina Department of Community Colleges) is the state agency that is legislatively assigned oversight responsibility for all of North Carolina's community colleges. The system consists of 58 community colleges serving North Carolina's 100 counties (NCCCS, 2008). Located in Raleigh, North Carolina, the North Carolina Community College System Office houses the NCCCS Data Warehouse in addition to its staff of administrators.

Persistence. According to Tinto (1993) and Pascarella, et al. (1986) the term student persistence or withdrawal behavior is a measure of the student's persistence or withdrawal

from the system of higher education. It has been operationally defined as working towards a four-year degree within the nine-year period. Because North Carolina community colleges do not award four-year degrees, for the purpose of this study credential or degree attainment was operationalized as any student with less than 12 college credit hours beginning their enrollment in one of four selected curriculum program areas at a North Carolina community college during fall semester 2005 and completing an associate degree, diploma, or certificate within a six-year period.

Program of Study. For this study, program of study was the area of academic interest selected by the student, usually at the time of admissions or initial enrollment at the community college. Interchangeable with the term major, students may select a program of study as a part of their application and enrollment process to the community college. Students may also change their program of study or major multiple times during their enrollment at the community college.

Propensity Score Analysis. Propensity score analysis refers to a statistical process utilized to reduce the effect of bias when group size may cause the regression to move toward the mean, thus reducing the reliability of the experiment (Rosenbaum & Rubin, 1983). Propensity scores were used in this study to decrease the confoundedness caused by the relationship between the variables of differing groups (Blackford, 2009).

Organization of Study

Chapter Two provides a review of classic and research literature discussing student persistence, in particular African American student persistence, the DAG between gender and ethnic and race groups, and student selection of program of study. The theoretical framework for the study is also addressed in chapter two.

Chapter Three of the study provides an overview of the study's methodological approach, presents the study's two research questions, and provides a design and rationale for the study. The role of the researcher is considered, as is the source of the data and the methodology used to select the study population. The chapter concludes with a section on the data's validity and trustworthiness.

Chapter Four presents the study's findings. Both research questions and their subquestions are addressed using appropriate statistical methodologies. The chapter begins by presenting a comparison between the student demographics contained in the dataset ($N = 42,856$) and the stratified sample ($n = 7,246$). Chapter Four ends with an analysis of the research questions using a stratified sample.

Chapter Five provides an analysis of the findings for both research questions and their related questions, including a section regarding the study's limitations. Chapter Five closes with study implications and suggestions for future research.

Chapter Two: Literature Review

This chapter provides a review of current and classical literature on student persistence, student major choice, the North Carolina Community College System, and African American males in community colleges. This chapter also examines the conceptual framework that guides the study.

Educational Attainment Gap

There is an educational attainment gap (EAG) among various students attending postsecondary institutions and persisting to degree attainment in the United States. Ethnic minority students are more likely to leave colleges or universities at a much higher rate than other student groups without obtaining a college credential (Carter, 2006). According to Carter (2006): “The gap between underrepresented minority students and other groups is particularly detrimental because it affects individuals’ long-term social mobility...” (p. 33).

African American males lag behind all other ethnic and race groups in obtaining postsecondary educational credentials (Garibaldi, 2007; Smith & Fleming, 2006). There are many factors that determine if a student will persist. Academic background, social and economic factors, race and ethnicity, and gender are a few of the factors (Leppel, 2001; Tinto, 1993). Disadvantaged community college students are at higher risks of not completing their degrees than are students enrolled in four-year colleges and universities. Two-thirds of all low-income, first-generation students entering public two-year colleges enroll for the second year compared to about 85% of students without these major risk

factors (Roach, 2008; Tinto, 1993). When risk factors are taken into consideration, most students who do not earn college degrees leave voluntarily, and not because of poor academic performance (Leppel, 2001). However, while the factors that influence student departure may be the same for students of color as those of other student groups, the magnitude of these factors is felt more strongly by minority students (Tinto, 1993).

In addition, community college students work more hours, are less academically prepared, enroll in fewer course hours and tend to come from lower socioeconomic backgrounds than do students who attend four-year institutions. Thus, community college students are less likely to persist than their peers who attend four-year universities (Fike & Fike, 2008). According to Baker and Ve'lez (1996), despite civil rights and affirmative action efforts, African American students are less likely than other students to complete degrees or to transfer to baccalaureate programs. Jenkins (2007) and Bailey (2003) also found that when controlling for student characteristics, students are less likely to persist or transfer to a four-year institution if they attend a community college or if the community college employs a large number of part-time or adjunct faculty.

Student Persistence

According to Donovan (1984) "Student persistence can be defined as a continuous variable ranging from not persistence (dropout) through persistence with some difficulty (intermit) to complete persistence" (p. 250). Minority student persistence at predominantly white college campuses and minority student persistence at rural colleges and universities are critical issues facing today's colleges and universities. Thomas Parker, Interim President and Senior Associate of the Institute for Higher Education Policy and an expert in student persistence, states that as an educational policy maker, it is important to pay close attention to

large gaps in the African American-white student graduation rate (Roach, 2008).

Donovan (1984) conducted a path analysis study of 403 African American youth enrolled in colleges across the country. Her research found that “the academic performance of students in college is the most important variable in the model with a substantial direct effect on persistence, $p = .45$ ” (1984, p. 253). “In other words, academic integration leads to better grades, which in turn leads to persistence” (Donovan, 1984, p. 253). Males that begin post secondary enrollment at the community college are more likely to continue their academic trajectory and earn bachelor’s degrees if they are attending an institution that is a good academic and social fit. Research also indicates the converse is true. The less integrated the student is, the more the likelihood of persistence to credential attainment decreases (Pascarella et al., 1986). The fact remains that large achievement gaps, as much as 22% in six-year graduation rates, exist between minority and non-minority students (Thomas, Cooper, & Quinn, 2003).

Fike and Fike (2008) conclude race and gender are not significant indicators of persistence rates of first-time community college students from the fall to the spring semester. Fike and Fike argue that student performance in developmental and academic courses such as reading and math instead are indicators of semester-to-semester student persistence. In addition, research indicates that fewer men are pursuing postsecondary degrees, and that for both male and female students race alone was not a significant indicator of academic success (Perrakis, 2008). This supports Donovan’s research, which indicates the persistence of low-income African American students is not much different than other college students (Donovan, 1984; Fike & Fike, 2008).

However, Felderman (1993) conducted a study of 1,626 first-time full-time community college students. The variables in the data set included student high school grade point average, student gender, age, ethnicity, educational goals, enrollment status, and basic skills needs. The variables were scored and ranked using logistic regression to determine their order as factors contributing to student persistence. While basic skills needs were found not to be significant in predicting student persistence, all of the remaining variables produced significant chi square values ($p < .01$). This contradicts the research findings of Fike and Fike (2008), Donovan (1984), and Perrakis (2008). According to Felderman (1993), male community college students, minority students with race status other than Asian, 20-24 year old students, and part-time student attributes contribute significantly to increased student attrition.

Students enroll in college to improve their potential to obtain gainful employment. “Students who attend college generally expect to obtain better jobs than they would obtain without attending college. Better jobs have nonpecuniary benefits and higher salaries, which enable a person to afford more amenities” (Leppel, 2001, p. 329). The goal of a student enrolled in college is to earn a college degree (Mellow & Heelan, 2008). Students with postsecondary educational experiences increase their earning potential over students with high school diplomas. Students who earn a college credential increase the magnitude of their earning potential when compared to students who do not earn a certificate, diploma, or degree (Pascarella & Terenzini, 2005; KewalRamani, Gilbertson, Fox, & Provasnik, 2007). A graduate with a four-year degree makes \$56,700 dollars annually, a community college graduate completing an associate’s degree earns \$43,200 annually while a non high school graduate earns about \$24,000 annually (Carnevale, Rose & Cheah, 2011). According to

Measuring Up (The National Report Card on Higher Education) 2006:

...a larger proportion of America's future workforce will come from ethnic minority and low-income groups. Many workers in these groups will be first-generation college students who are served least effectively by education at all levels. Such students graduate from high school, enroll in college, and complete college programs at significantly lower rates than the baby boomers that preceded them. (Callan, 2006, p. 10)

Pascarella et al. (1986) indicated that although factors influencing the college persistence rates for men and women differ, the importance of student-institution fit has the greatest impact on student persistence to degree attainment in higher education. Pascarella's study also found that:

Although only a few student background characteristics have significant direct effects on student persistence, several of these variables (e.g., ethnicity, and secondary-school social, and academic accomplishment) significantly influenced subsequent variables in the model, which in turn directly influenced persistence. (Pascarella et al., 1986, p. 67)

Additionally, Kaba (2005) identified six factors that contribute to the education attainment gap between African American men and African American women:

- the high African American male secondary school drop-out rate,
- the increased participation rate in the U.S. military by African American men,
- smaller numbers of African American males when compared to African American females in the U.S. population,

- African American men entering the workforce at younger ages than African American women,
- higher death rates of college age African American men than African American women, and
- higher incarceration rates for African American men.

This educational attainment gap has consequences for future generations of African Americans. College educated African American women are positioned to obtain more leadership roles in the community and in the workforce than African American men. In addition, higher educated people tend to marry people that share similar educational backgrounds. The pool of eligible college educated African American men to choose from is becoming increasingly smaller (Kaba, 2005).

Gosman's research on the impact of race on college student progression posits that when controlled for other student and institutional characteristics the effects of race are diminished (Gosman, Dandridge, Nettles, & Thoeny, 1983).

Our findings showed that race has a strong bivariate relationship to student's performance in college, with white student cohorts consistently out performing African American cohorts in terms of attrition rates, tendencies to follow the prescribed progression pattern, and overall progression rates. However, racial differences in performance disappeared when other student and institutional characteristics were taken into account... (Gosman et al., 1983, p. 233)

While the researchers were unable to make distinct conclusions about race and other variables as a determinant of college student progression, they do suggest that:

...colleges and universities would do well to rethink special retention and counseling

programs designed especially to serve minority group students. Retention programs will in all likelihood be more effective if they are designed around those characteristics each institution finds to be directly related to the performance of its students. (Gosman et al., 1983, p. 234)

Davies and Guppy (1997), using the National Longitudinal Survey of Youth ($n = 6,111$) studied social economic status, race, and gender as a function of student's selected field of study. The researchers found men entered more lucrative areas of study than did women and students with more resources entered better universities and higher paying fields, but race was insignificant in determining student major. "Socioeconomic status and the two race variables are not statistically significant, which is contrary to the presumptions of some theorists that low-status/low-payoff fields necessarily serve largely as 'dumping grounds' for working class and minority students" (Davies & Guppy, 1997, p. 1427).

Using Tinto's (1975, 1987) model of student persistence, which was revised in 1993, Pascarella in figure 2.1 adds 19 variables, which were able to account for 19% to 29% of the variance among African American men, white men, African American women, and white women attending four-year colleges and universities (1985). The most significant finding of Pascarella's research is that African American student withdrawal from postsecondary institutions is more a function of poor academic performance and grades than that of white students (1985).

Other findings from the research show African American men who attend multiple institutions or who attend large colleges are more negatively impacted by these associations than are white male students (Pascarella, 1985). Also, college transfer, while deleterious for

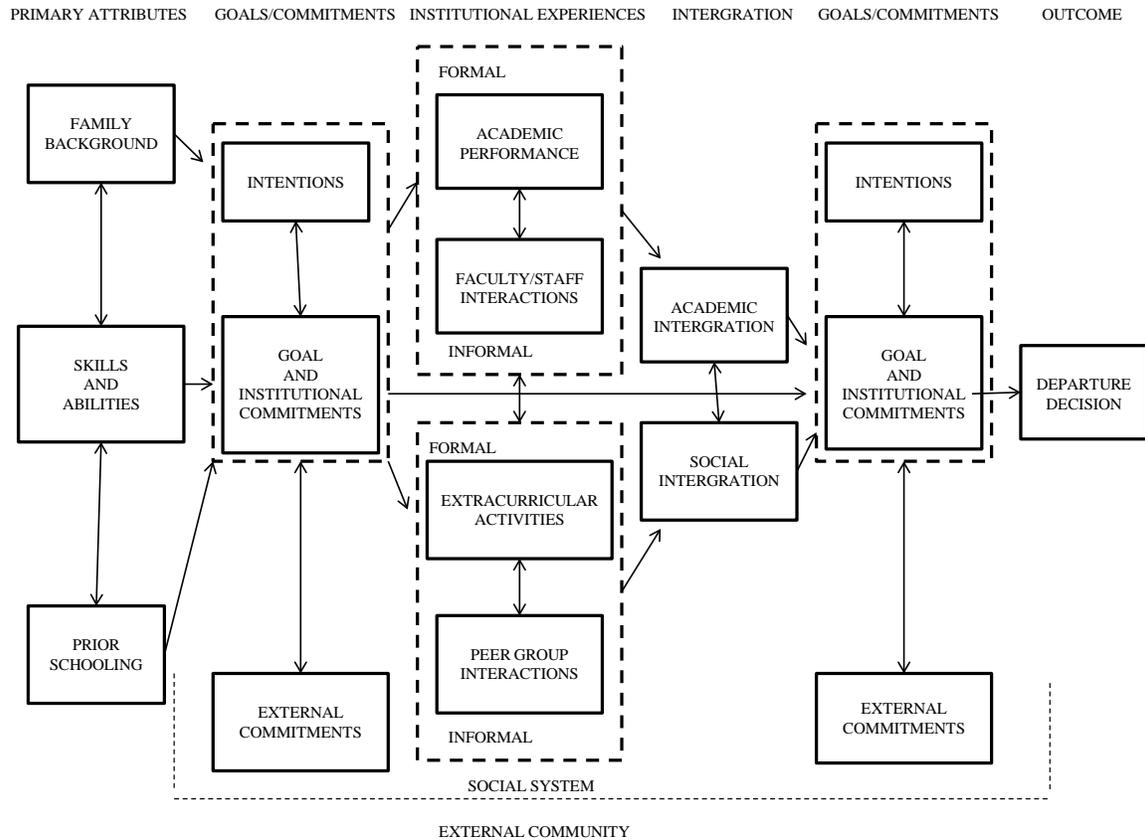


Figure 2.1. Tinto's Model of Voluntary Student Departure. Adapted from *Leaving College: Rethinking the causes and cures of student attrition*, 2nd edition by V. Tinto, 1993.

all college students, may have a more deleterious impact on African American men (Pascarella, 1985).

Curriculum Program Selection

North Carolina community college students select a program of study when they apply to the college. Each program of study is categorized by a unique CIP code. The program of study and the CIP code associated with it is equivalent to selecting a major for this study. The student selection of curriculum program or major is an important decision. It determines the student's educational map, resources students access, their student peers,

faculty they engage, employment opportunities, and ultimately the social and economic trajectories available to students (Chickering, 1969). The choice of college major is one of life's most important decisions. Unfortunately, for most Americans this choice represents one of their largest regrets (Beggs, Bantham, & Taylor, 2008).

Selecting an academic curriculum program of study is an important choice for African American males, and is an important factor regarding their persistence to credential attainment. African American students enrolled in the university place a higher value on their academic program when they perceive that the academic area has immediate financial returns (St. John et al., 2004). On the other hand, white students do not place as much importance on academic program, but persist at higher rates than did African American students (St. John et al., 2004). Current research does not provide much insight into the relationship between major choice and ethnicity or race and student persistence (St. John et al., 2004).

There are two main research branches regarding student choice of major. Beggs et al. (2008) indicate in their research that there are specific factors that influence the choice of major selection. They also posit that there is a subset of the general research that focuses on the relationship between specific individual demographics (e.g., race, gender, and years in school) and student choice of major. Factors that influence a student's choice of curriculum program include information gleaned from college catalogs, postsecondary information fairs, and high school and college counselors and teachers.

Research suggests personality is also an important factor in a student's choice of curriculum program. Students who possess artistic talents tend to study programs in the arts. Those who are social activist may choose majors in education or social sciences. Students

interested in achieving high social and economic status will choose majors in business, engineering, or architecture (Austin, 1993; Porter & Umbach, 2006). Since college students choose majors that are consistent with their personality, student support services could support student success by developing programs that help students align their expectations with student personality type (Pike, 2006).

While student's interests, political orientation, and personality are significant influencers of a student's major choice, "...racial differences remain significant even in our fully controlled models, but the differences were reduced slightly after introducing controls" (Porter & Umbach, 2006, p. 444). Students of color are underrepresented in the areas of science. "We observe that only 6.4% of African Americans at the institution in this study major in the sciences. If we were to control for background characteristics and personality, 10.6% of the African Americans would major in the sciences" (Porter & Umbach, 2006, p. 446).

North Carolina Community Colleges

The North Carolina Community College System's open door admission policy grants non-competitive admission to students who are 18 years of age or who possess a high school diploma or its equivalent. This is what provides the greatest challenges and opportunities for community colleges (Mellow & Heelan, 2008). "Unfortunately, improved access has not translated into higher levels of college attainment, particularly for low-income students, students of color, and others who traditionally have not fared well in college" (Borcoman et al., 2008). One of the most important challenges for colleges and universities today is finding methods to increase student persistence and degree attainment (Elkins, Braxton, & James, 2000). Nationally, of the new, first-time community college students who enrolled

during the 1995-1996 academic year, less than half earned a degree or certificate or transferred to a senior institution during a six-year time frame (Horn, Nevill, & Griffith, 2006). During 1990, minority student degree attainment declined. Only 18% of associate degree recipients and 16% of bachelor's degree recipients were non-white or Hispanic students (Horn & Maw, 1995).

The mission of the North Carolina Community College System is to provide an open door to high-quality, accessible educational opportunities that minimize barriers to post-secondary education, maximize student success, develop a globally and multi-culturally competent workforce, and improve the lives and well-being of individuals by providing:

Education, training and retraining for the workforce, including basic skills and literacy education, occupational and pre-baccalaureate programs. Support for economic development through services to and in partnership with business and industry and in collaboration with the University of North Carolina System and private colleges and universities. Services to communities and individuals, which improve the quality of life. (NCCCS, 2008, p.3)

Fifty-eight colleges located geographically across North Carolina currently enroll more than 850,000 students in degree, diploma, certificate, and non-credit programs. With an open door admissions policy, North Carolina's community colleges serve a racially, ethnically, and social economically diverse student body. In 2008-2009 there were 334,879 students enrolled in degree, diploma, or certificate programs at North Carolina community colleges. Of that total, only 22,216 North Carolina community college students identified themselves as African American males—fewer than one in ten (NCCCS, 2008).

African American Males in North Carolina Community Colleges

Nationally, while African American males are walking through the doors and enrolling in community colleges, they are leaving without earning a certificate, diploma or associate degree.

...one only has to take a look behind these “open doors” to see very clearly that African American males are disappearing before they complete any meaningful goals, and those who remain lag behind other learners in almost every indicator of academic achievement. (Esters & Mosby, 2007, p. 45)

In North Carolina, the benefits of obtaining a college credential continue to increase, and the number of African American male enrollments also increases. During 2005-2006 there were 20,885 African American males enrolled in degree programs. In 2010-2011, this number grew to 30,358, an enrollment increase of 31% (See Figure 2.2).

On the surface, recent gains in postsecondary enrollment rates for African-Americans reveal significant progress for a group that has historically been shut out of higher education opportunities. Yet as their enrollment continues to grow at community college campuses, many of these students are struggling to attain achievement on par with other students. (Leinbach, 2005)

National research data show more than half of African American community college students drop out of college within a six-year period. Eight years after graduating from high school, 72% of African American community college students have not earned a college credential or transferred to a four-year college or university, while 50% of white community college students have successfully transferred or have attained a college credential (Leinbach, 2005). Eroding affirmative action policies and increasing selectivity of state universities heighten the

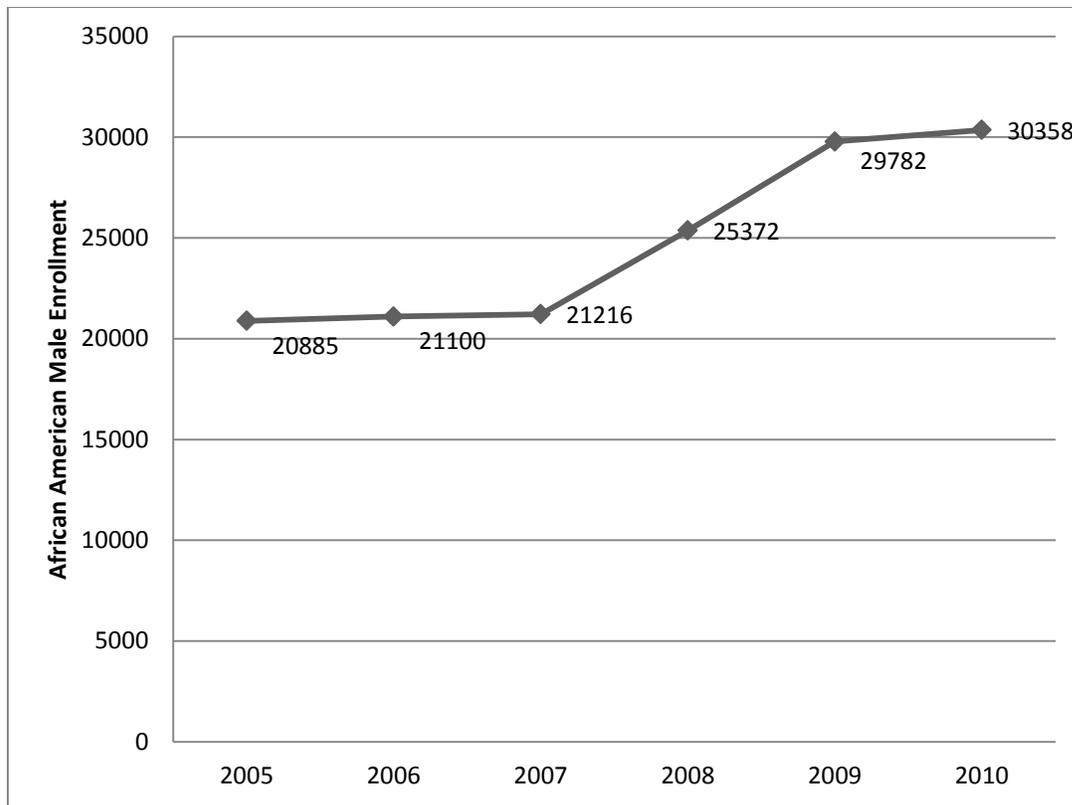


Figure 2.2. African American Male Enrollment in Curriculum Programs 2005-2010, NCCCS. Adapted from

http://www.nccommunitycolleges.edu/Statistical_Reports/index.html, 2005-2006 through 2010-2011.

important role that community colleges play in providing postsecondary access for African American students (Leinbach, 2005).

Conceptual Framework

Student academic and social integration into a college or university is an important aspect of student persistence and degree attainment. While most of the research in this area uses Tinto's integration framework (1993) to describe student persistence for students attending four-year colleges or universities Karp, Huges, and O'Gara (2011) postulate that

Tinto's framework is also applicable to community college students. These researchers found that social and academic integration for community college students can be developed in the classroom through classroom pedagogical practices such as group projects, classroom discussions, and by faculty-facilitated relationships and networks among students. The most significant findings of their study are threefold. The researchers found that Tinto's framework (1993) was appropriate for community college students, that academic and social integration for university and community college students may be different, and that integration is interconnected and the interconnectedness may look the same for nonresidential students attending four-year institutions (Karp et al., 2011).

Tinto's theoretical framework (1993) guiding the research of Karp et al. (2011) includes factors that impact student persistence. Tinto posits (1993) that college student attrition is a function of the degree to which students are socially and academically integrated into the college community, have developed support groups, and are motivated to achieve their educational goal. According to researchers: "This model, which assumes that persistence/withdrawal behavior is largely determined by the student's integration into the social and academic systems of the institution, has been a major theoretical advance in attrition research" (Pascarella et al., 1986). Using Tinto's longitudinal model of institutional departure, Figure 2.1, the researchers' study addresses the academic integration component of the model (Pascarella et al., 1986). Student choice of academic major is one component of academic integration, and, because of the interconnectedness demonstrated by Karp et al. (2011), social integration is as well for students who attend community colleges.

Figure 2.3 describes the model for this research. Community college students enroll and select a program of study during the college admissions process. Both academic and

social integration take place in the community college classroom. Students either persist or do not persist to credential attainment. This study examined the rate that African American males, African American females, white males, and white females persist to credential attainment as well as describes the educational attainment gap between African American males, African American females, white males, and white females.

Leppel (2001) proposes that college major may be related to student persistence. Students pursuing academic majors related to a particular job or profession such as business, engineering or health may have different persistence rates than students in other majors. Students in other majors may be interested in the pursuit of knowledge and find their course work interesting (subject interest effect), while students in job or professional majors may be more interested in the monetary benefits of earning the degree (goal commitment). Although more committed to obtaining their degree goal, these students may find the academic work uninteresting, resulting in two competing and opposite effects. The goal commitment effect and the subject interest effect may influence a student's decision to persist or to leave college (Leppel, 2001).

Purpose Statement

The purpose of this study was to examine two research questions. First, what is the relationship between the curriculum program area selected and credential attainment for African American males in the North Carolina Community College System and second, what is the relationship between the credential attainment rates for African American males relative to other selected student groups not classified as African American males? To answer the first question, the credential attainment rate of African American males completing the requirements for a certificate, diploma, or degree within a six-year period in

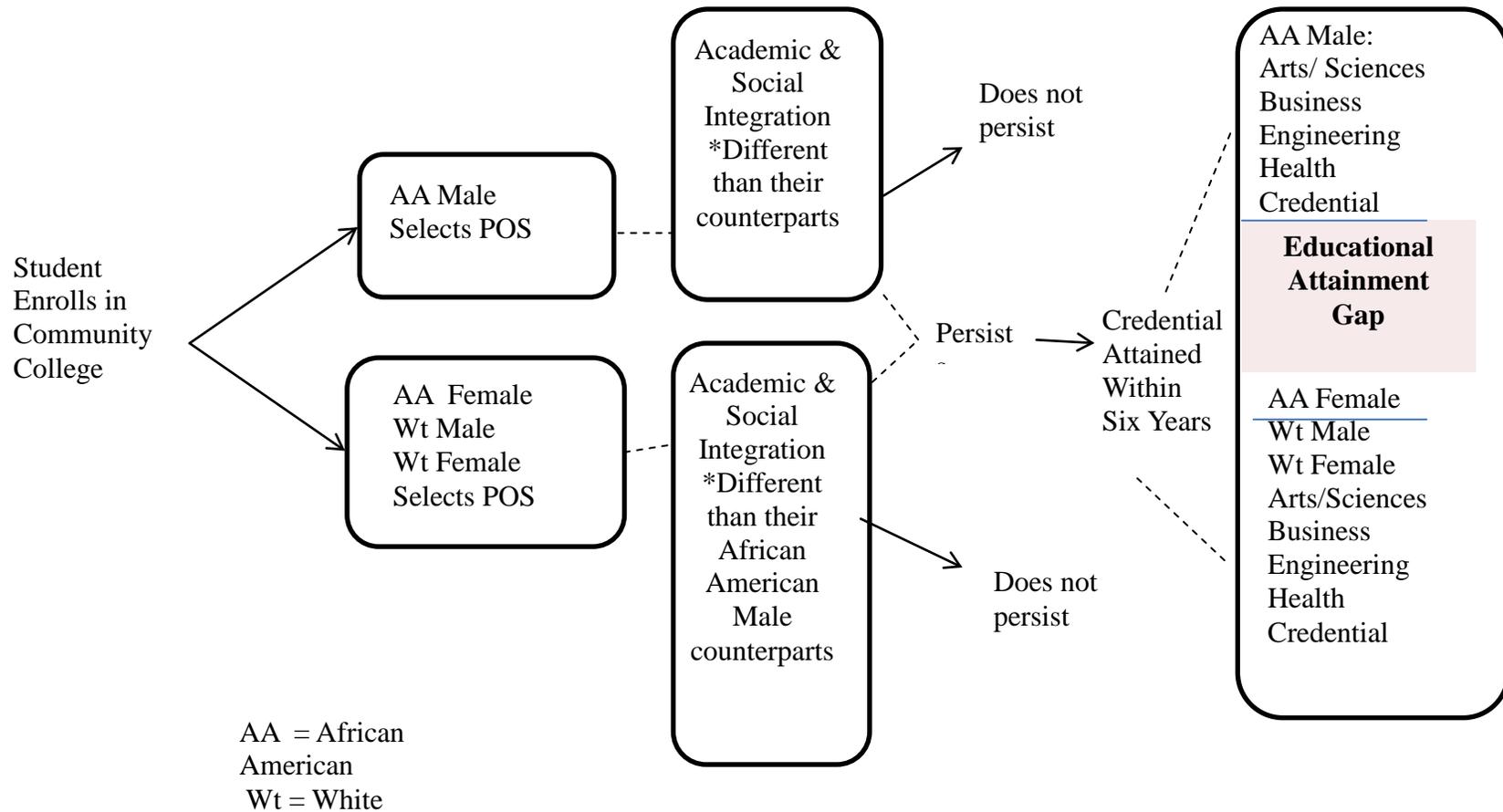


Figure 2.3 Degree Attainment for African American Males Enrolled in Selected NCCCS Programs of Study. Flow chart of college student enrollment, program of study (POS), persistence, and credential attainment. AA = African American. Wt = White.

the Arts and Sciences, Business, Engineering, and Health CIP code areas was determined. To answer the second research question, the credential attainment rate for African American females, white males, and white females enrolled in the four CIP code areas listed above was determined. The study also determined the difference in student credential attainment based on the independent variables included in the study.

Summary

African American male degree attainment is important and of concern to educational policy makers and scholars. African American males are performing poorly at all educational levels. Without a degree, African American males are more likely to be incarcerated than men in other racial and ethnic groups. Also, without a college degree the ability for African American men to participate in fully realizing the American Dream is almost impossible. Identifying the educational attainment gap for students enrolled in the North Carolina Community college system is important because if America is to return to the top of the global market it must produce more degree completers. The integration framework created by Tinto (1993) provides a tool to describe how behaviors, such as selecting a major, can influence student success.

In North Carolina only eight of 100 community college graduates are African American. This study addresses a gap in the current body of knowledge by identifying the attainment rates for African American males enrolled in the state's community college system and then comparing those rates to the attainment rates of other student groups.

African American men are behind other student groups with regard to postsecondary participation and credential attainment. It is important that colleges pay close attention to student persistence. While the numbers of students enrolled in North Carolina's community

colleges increases, the number of African American men enrolled in community college also continues to increase (Figure 2.2). Notwithstanding these increases in African American male enrollment, the credential attainment for these students is not increasing correspondingly. The need for a data-driven examination of this situation underscores the importance of this study.

Chapter Three: Methodology

The purpose of this study was to investigate the relationship between African American males enrolled in North Carolina community colleges and the credential they attained by selected CIP code area. Additionally, this study compared the degree attainment of African American males with the degree attainment of African American females, white males, and white females also enrolled in North Carolina community colleges. The study includes research questions, a list of the variables, data collection procedures, data analysis, and statements regarding the study's validity and trustworthiness. To determine degree attainment rates for African American males enrolled in North Carolina community colleges and attainment gaps between African American male, African American female, white male, and white female student groups, the following variables were examined: the student's initial program of study (CIP) code, student gender, student ethnic code, and final CIP code (Appendix C). Appendix D lists all of the 2005 CIP codes for the North Carolina Community System included in this study.

Research Questions

This persistence study examined two questions. First, the study considered African American male degree attainment in the North Carolina community college system by addressing this question: What is the relationship between the curriculum program area selected and degree attainment for African American males in the North Carolina

Community College System? The following sub-questions addressed were:

- What is the attainment rate for African American male students enrolled in the Arts and Sciences curriculum area?
- What is the attainment rate for African American male students enrolled in Business Technologies curriculum area?
- What is the attainment rate for African American male students enrolled in the Engineering Technologies curriculum area?
- What is the attainment rate for African American male students enrolled in the Health Sciences curriculum area?

The second research question that guided this study was: What is the relationship between the degree attainment rates for African American males relative to other selected student groups not classified as African American males? The following sub-questions addressed were:

- What is the relationship between the degree attainment rate of African American men and African American women in the Arts and Sciences, Business Technologies, Engineering Technologies, and Health Sciences curriculum areas?
- What is the relationship between the degree attainment rate of African American males and white males in the Arts and Sciences, Business Technologies, Engineering Technologies, and Health Sciences curriculum area?
- What is the relationship between the degree attainment rate of African American males and white females in the Arts and Sciences, Business

Technologies, Engineering Technologies, and Health Sciences curriculum area?

Research Design

According to Sproull (2002), quantitative research studies are designed to more deeply understand the factors that are being investigated and the process and procedures used to examine them. This study is designed to investigate and quantify credential attainment among African American men and African American females, white males, and white females enrolled in selected curriculum programs of study through a quantitative research design. This study adds to the work of Bers (1988) and Leppel (2001) by expanding the research to a statewide community college system. In addition, this study used propensity score analysis to address multicollinearity among the study's variables.

Leppel (2001) conducted a persistence study using a two-step process combining least squares regression and national-level data to study the relationship between student major and persistence of freshmen at four-year universities. Leppel concluded differences in college persistence rates can be explained by such factors as student commitment to goal, student interest in the subject matter, social forces, and the student's self-image. Leppel's study reported student persistence rates for college students who indicated a major in arts and sciences, business, engineering, education, health, and undecided (2001).

This study of student persistence in the North Carolina Community College System is an adaptation of a study conducted by Bers (1988). In her study, Bers researched community college student persistence as a function of student academic major choices. Bers' study, using a series of database extracts, SQL tables, and a descriptive model developed by Simpson (1987), tracked the persistence of 2,202 first time community college students by

major. Using 1984 enrollment data from a middle-sized community college in a suburban area, Bers tracked students who enrolled in one of nine majors that had at least 50 new students. Bers' study variables included student social security number, gender, age, first term of college enrollment, major, credential awarded, grade point average, and the total number of credits earned. Her variable set did not include student race or ethnicity.

“Observed differences in persistence within major and at the institution by major suggest there may be subtle as well as obvious factors underlying student performance” (Bers, 1988, p. 171). Bers' study concluded that there are differences in students' persistence among majors. Students in hospitality programs were more likely to persist while students in science and engineering programs changed their majors (Bers, 1988). The data also show that the student's gender, age, and the number of times a student changes majors were important determinants of student persistence (Bers, 1988). Lacking from the study are statistics describing the relationship between race and program area of study.

Using community college student data extracted from the NCCCS Data Warehouse, this study adds to the research by moving from a single community college to one including the 58 constituent institutions of the North Carolina community college system. The study population consists of the Fall 2005 cohort of community college students enrolled in one of four curriculum level programs (Arts and Sciences, Business Technologies, Engineering Technologies, and Health Sciences) at all of North Carolina's 58 community colleges. Unlike Leppel (2001) and Bers (1988), this study included the student variables of student race and ethnicity. Expanding on Bers' work, and using the process described by Leppel, students having earned less than 12 college credit hours and enrolled in academic programs of study with CIP codes in the area of Arts and Sciences, Business Technologies,

Engineering Technologies, or Health Science were selected. Students with ethnic codes not identified as African American or white were excluded from the study.

This study descriptively compared African American students who persist to credential attainment to other community college student groups: African American females, white females, and white males who also persist to certificate, diploma, or degree attainment in selected programs of study. For the purpose of this study, the following types of students were excluded:

- Students who had completed 12 or more college credit hours prior to the beginning of the Fall 2005 semester. Students can earn college credit through a myriad of ways, including but not limited to Advanced Placement, dual-enrollment programs while enrolled in high school and military service.
- Students who transferred to institutions not identified as one of the 58 colleges in the North Carolina community college system.
- Students who withdrew from the North Carolina community college system during the Fall 2005 semester.

Differences in the size of the student cohort populations may increase the standard errors and have effects on F values, particularly as the N increases. The original sample contained 3,282 African American males, representing 7.7% of the student population in the data set. There were 2.66 times as many African American females, ($n = 8,608$), 3.36 times as many white males ($n = 11,036$) and 6.1 times as many white females ($n = 19,930$) in the original sample than there were African American males. A smaller sample size would reduce these differential effects.

Multicollinearity may also be an issue. According to Hair, Black, Babin, Anderson,

and Tatham (2006), collinearity/multicollinearity is:

The expression of the relationship between two (collinearity) or more (multicollinearity) independent variables. Two independent variables are said to exhibit complete collinearity if their correlation coefficient is 1 and the complete lack of collinearity if their correlation coefficient is 0. Multicollinearity occurs when any single independent variable is highly correlated with a set of other independent variables. An extreme case of collinearity/multicollinearity is singularity, in which an independent variable is perfectly predicted (i.e., correlation of 1.0) by another independent variable (or more than one). (2006, p. 170)

The effects of each the independent variables in this study on the dependent variable of completion may be masked since the predictor variables may be related to each other. The use of propensity score matching allows the selection of a sample that effectively accounts for and eliminates multicollinearity effects, allowing the study to examine the effects of the individual predictors (Rossenbaum & Rubin, 1983). If not accounted for, confoundedness can cause the researcher to underestimate or overestimate the relationship between the variables of interest (Blackford, 2009). Propensity scores, calculated using logistic regression, will produce a score between the range of zero and one, which represents the predicted probability that any member in a particular group belongs to the group when cofounder variables are accounted for (Blackford, 2009).

This study used a quantitative design due to the large size of the sample. Data from the North Carolina Community College System's Data Warehouse was used to address the research questions. Appendix B shows enrollment by race/ethnicity for each of the 58 North Carolina community colleges. During the fall 2005 semester there were 268,433 students

enrolled in curriculum programs in the 58 community colleges in North Carolina (Table 3.1).

Table 3.1

*North Carolina Community College System Curriculum Student Enrollment By College
Reporting Year 2005-2006*

<u>College Name</u>	<u>Associate</u>	<u>Diploma</u>	<u>Certificate</u>	<u>Transfer</u>	<u>Total</u>
Alamance CC	3,935	451	525	1,409	6,320
Asheville-Buncombe TCC	4,450	372	207	3,593	8,452
Beaufort County CC	1,362	152	66	329	1,879
Bladen CC	1,542	103	53	303	1,987
Blue Ridge CC	1,603	143	240	833	2,737
Brunswick CC	776	274	95	184	1,297
Caldwell CC and TI	2,720	1,055	327	1,022	5,002
Cape Fear CC	6,902	454	730	1,688	9,591
Carteret CC	1,552	135	92	412	2,146
Catawba Valley CC	4,541	314	414	1,377	6,646
Central Carolina CC	3,383	684	868	1,572	6,304
Central Piedmont CC	13,939	518	498	9,877	24,388
Cleveland CC	2,468	513	252	1,307	4,437
Coastal Carolina CC	5,019	271	198	950	6,190
College of the Albemarle	1,963	160	110	646	2,820
Craven CC	3,346	159	89	977	4,506
Davidson County CC	2,772	380	337	600	3,934

<u>College Name</u>	<u>Associate</u>	<u>Diploma</u>	<u>Certificate</u>	<u>Transfer</u>	<u>Total</u>
Edgecombe CC	2,396	259	35	899	3,546
Fayetteville TCC	8,299	590	162	3,639	12,250
Forsyth TCC	7,169	524	598	1,682	9,855
Gaston College	5,353	385	270	1,202	7,139
Guilford TCC	10,845	538	42	1,548	12,804
Halifax CC	1,359	179	300	234	2,036
Haywood CC	1,398	271	265	955	2,828
Isothermal CC	2,200	268	129	530	3,052
James Sprunt CC	953	351	158	491	1,858
Johnston CC	2,934	189	844	2,312	6,188
Lenoir CC	2,470	127	198	1,024	3,733
Martin CC	846	79	24	344	1,277
Mayland CC	796	207	365	533	1,836
McDowell TCC	993	283	180	301	1,717
Mitchell CC	1,727	194	131	476	2,491
Montgomery CC	751	96	105	296	1,224
Nash CC	2,360	94	216	1,183	3,788
Pamlico CC	256	37	148	140	575
Piedmont CC	1,649	231	626	1,266	3,732
Pitt CC	6,110	252	286	1,914	8,310
Randolph CC	1,835	551	113	651	3,085
Richmond CC	1,710	61	102	270	2,107

<u>College Name</u>	<u>Associate</u>	<u>Diploma</u>	<u>Certificate</u>	<u>Transfer</u>	<u>Total</u>
Robeson CC	2,147	148	178	180	2,612
Rockingham CC	1,547	224	551	488	2,692
Rowan-Cabarrus CC	4,124	1,597	535	1,037	7,090
Sampson CC	1,317	142	117	374	1,917
Sandhills CC	3,589	83	193	1,112	4,901
Southeastern CC	1,723	176	216	551	2,589
South Piedmont CC	1,600	316	267	690	2,769
Southwestern CC	1,847	73	193	579	2,650
Stanly CC	1,737	107	332	874	2,988
Surry CC	2,265	703	142	1,070	4,079
Tri-county CC	891	79	50	406	1,407
Vance-Granville CC	3,870	529	430	832	5,550
Wake TCC	13,588	680	1,099	2,370	17,465
Wayne CC	3,298	201	179	751	4,346
Western Piedmont CC	2,701	93	169	814	3,689
Wilkes CC	2,406	129	65	976	3,513
Wilson Technical CC	1,966	176	119	467	2,678
System Total	180,019	17,636	15,566	64,958	268,433

Note: Unduplicated headcounts are reported in each cell. Rows and columns will not add up.

Adapted from the NCCCS website, *2005-2006 Statistical Reports, Table 1: Student*

Enrollment by College. Retrieved from

<http://www.nccommunitycolleges.edu/Statistical%5FReports>

This study produced descriptive data and correlational findings. Major population findings and characteristics for large groups are best described utilizing descriptive statistics, whereas correlational findings assist with better understanding relationships without addressing questions regarding causation (O'Rourke, Hatcher, & Stepanski, 2005).

This study examines the dependent variable-student certificate, diploma or degree attainment. The Fall 2005 North Carolina community college's selected student cohort was examined over a six-year period to determine if the students in the selected population earned a credential from one of the state's 58 community colleges. The student's curriculum program area, one of 13 values denoting the student's area of academic interest, was captured as of their initial enrollment during fall semester of 2005. The independent variables for the study were: 2005 CIP code area, ethnic code, college size, 2005 student age, 2005 Pell grant recipient, changed CIP code, gender, and credential CIP area. The dependent variable for the study are completer, indicated student certificate, diploma, or degree attainment in one of the four curriculum program areas evaluated in this study (Table 3.2).

Variable Descriptions

Nine variables were used in this study to describe student characteristics. These variables are defined below.

2005 CIP Code Area contained four codes representing the CIP area. 1 = Arts/Sciences, 2 = Business, 3= Engineering and 4 = Health. The CIP codes for the students selected for this study was converted to a CIP Code Area using the table in Appendix D.

Students in the data set were coded by race. Students indicating their race to be Black, non-Hispanic were coded 2 and Students indicating ethnicity to be white, Non-

Hispanic were coded 4. Additionally, student gender was coded as female (0) or male (1).

Table 3.2

Variables Used to Describe Student Characteristics

Variables	Dependent Variable	Independent Variable	Confounding Variable
2005 CIP Code Area		X	X
Ethnic Code		X	X
College Size		X	X
2005 Student Age		X	X
2005 Pell Grant			
Recipient		X	X
Changed CIP Code		X	X
Gender		X	X
Credential CIP Code			
Area		X	
Completer	X		

A dummy code EthnicGender was created to conduct the analysis between the sample cohort groups. African American males are coded 1, African American females are coded 2, white males are coded 3, and white females are coded 4.

Using the 2012 Carnegie classifications, the 58 North Carolina community colleges are classified as very small, small, medium, large, or very large enrollment based on the college's annualized full-time equivalent (FTE) enrollment for the 2005-2006 academic year. Very small community colleges have FTE enrollment of less than 500 students, small

colleges are 500-1,999 FTE, medium colleges enroll 2,000-4,999, large two-year colleges enroll 5,000-9,999 students, and very large community colleges enroll at least 10,000 FTE students (Carnegie Foundation for the Advancement of Teaching, 2012).

Some of the students included in the study sample met federal earning eligibility requirements and qualified for financial assistance to pay for some or all of the cost of college attendance. Students that applied for and received federal assistance from the U.S. Department of Education (2005 Pell Grant Recipient) are coded 1; all other students are coded 0.

Community college students may change their program of study several times throughout their enrollment. In this data set, students that changed their major one or more times during their enrollment period are coded 0, all other students are coded 1.

The variable Credential CIP Code Area indicated the CIP code area in which the credential was earned. If a student changed their program of study and earned a credential in a different CIP area than 2005 CIP Code Area the last CIP code is represented by this variable. Additionally, if the student earned multiple diplomas, certificates, or degrees, Credential CIP Code Area captures the CIP code of the highest credential earned, with a degree being the highest credential and a certificate being the lowest.

This study investigates the dependent variable of student credential attainment. Students in the data set that earned a certificate, diploma, or degree from any community college in the North Carolina community college system are coded 1. Students who withdrew or transferred from the community college without earning a credential are coded 0.

The list of confounding variables used in this study is not comprehensive. Propensity

scores for the main dependent variable of Completer were calculated for the confounding independent variables using logistic regression. Version 19 of Statistical Package for Social Sciences (SPSS) was used to calculate the propensity scores and to determine the stratified sample of subjects to reduce the multicollinearity effects introduced by the confounding variables.

Using the analyze function in SPSS, a binary logistic (logistic regression) was run on all students who met the study's selection criterion discussed earlier. The dependent variable was Completer—indicating if the student earned a credential or not. The independent variables discussed earlier were entered as covariates in this analysis. Probabilities (propensity scores) were calculated and saved for each student record in the select sample. Next, the SPSS transform function was used to stratify the sample. Visual binning of the propensity scores (predicted probabilities) was used to create five cut points. Using the analyze/descriptive statistics function of SPSS, Completer was identified as the row and the binned scores as the columns. Each row was visually inspected to determine which stratified sample yielded the most even distribution of students among completers and non-completers. This stratified sample was used to answer the second research question.

After using propensity score analysis to eliminate the multicollinearity effects, Chi-Square analysis was conducted to determine the relationship between the independent and dependent variable. The Chi-Square analysis is used to determine if a relationship exists among pairs of categorical variables (Myatt, 2007). Since all of the variables used in this study are categorical, Chi-Square analysis was used to determine if there is a statistically significant relationship between the dependent variable (degree attainment) and the independent variables (gender, race, and CIP code).

To determine the direction and the magnitude of the relationship between the dependent variable and independent variables a stepwise logistic regression analysis was performed. Logistic regression coefficients provide the researcher with a measure of the influence of the independent variable in predicting degree attainment (Hair et al., 2006).

Participant Selection

Four CIP codes were selected for this study. These areas, Arts/Sciences, Business, Engineering, and Health, were selected to align with the academic divisions or schools at most of the North Carolina community colleges in this study. Additionally, the areas were selected to provide consistency with other community college persistence studies. Leppel (2001) studied students in the areas of arts and sciences, business, engineering, education, health, or undecided. North Carolina community colleges do not offer undecided as a program of study option. Additionally, education programs in North Carolina community colleges are contained in the Arts/Sciences CIP code area. The North Carolina community college system assigns the CIP code to each of the programs in the state.

The NCCCS Data Warehouse contains information about student demographics, their academic field of study, financial aid, academic performance (course grades), persistence and degree attainment for all students enrolled in each of the system's 58 community colleges. This study collected student level data from the NCCS Data Warehouse on the cohort of community college students who were enrolled in one of four curriculum programs of study—Arts and Sciences, Business Technologies, Engineering Technologies, and Health Sciences for the Fall 2005 semester and followed their persistence for six consecutive academic years. Students with less than 12 hours of college credit earned prior to the beginning of the Fall 2005 were selected for the study. Only students that indicated a race

code on their admissions application of African American or white were included in this study. Additionally, students selected for this study have a gender code of male or female in the NCCCS Data Warehouse.

For the purpose of this study there was no distinction made regarding a students' enrollment status of full-time versus part-time. The study's six-year time frame allowed ample time for full-time or part-time students to complete a certificate, diploma, or a two-year degree.

Data Collection

With permission from the North Carolina Community College System to use longitudinal data from the NCCCS Data Warehouse regarding student enrollment and degree attainment, the study relied on a Microsoft Office Excel file containing curriculum student enrollment data for the Fall 2005 through Spring 2010 semesters.

Ethical Considerations

This study did not utilize active human subjects. A file containing student demographic and academic data was created from a pre-existing set of data. The created extract file was queried and analyzed using SPSS and Microsoft Excel software. Ethical issues regarding participant consent, student privacy rights, and anonymity were of no concern for the design of this research project (Sproull, 2002). Personally identifiable data in the NCCCS Data Warehouse was stored and referenced by student social security number. All personal student identifiers including student social security numbers, student name, and student address were removed from the student record before the data set was released for the study. Additionally, the NCCCS Data Warehouse was a secondary data source. The original data regarding student demographics, student academic performance, and student persistence

is collected by each of the 58 North Carolina community colleges. The community colleges electronically transmit the data to the NCCCS Data Warehouse annually at the conclusion of each academic term. This study utilized, presented and published cumulative student data. The Appalachian State University's Institutional Review Board's (IRB) and the North Carolina Community College System Office provided approval prior to beginning the study.

Using data that already exists classifies this study as an historical design research study. Historical research models are best suited when the data already exists, cannot be manipulated, and the researcher cannot impact how the data was collected. An historical design research project is the only way to evaluate past events (Sproull, 2002). Sproull has identified advantages to using this method of inquiry. An advantage to an historical design research project is that it allows the researcher to look for relationships among past events. An historical design is unobtrusive—participants do not have the opportunity to change the data or be influenced by the research design (Sproull, 2002).

Statistical Software

The data analysis for this study utilized the current version (19.0) of the Statistical Package for Social Sciences (SPSS) for Windows software to clean and analyze the data. SPSS is a comprehensive statistical software package used in research to analyze data and provide descriptive statistics and statistical analysis of the study's variables. The study also used the current version of SPSS and Microsoft Office Excel to create tables and figures.

Validity and Trustworthiness

The NCCCS Data Warehouse contains longitudinal student and college enrollment data from 1995 through 2010. The data used meets state and federal standards for validity and accuracy. Community colleges report these data annually primarily for the purpose of

state funding allocations. A limitation to the information in the database is the possibility of data entry error.

The NCCCS Data Warehouse provided the only viable option for data collection for this study. The study's six-year time frame did not allow for collection of information directly from students. Community college students that began their enrollment in 2005 may fall into one of several enrollment categories at the time this study was conducted. They may still have been enrolled at the community college, completed a credential, transferred to a college or university, or withdrawn from the college. Because of the transient nature of community college students, contact and college-level enrollment data may have only been available for the students that were enrolled at the time this study was conducted.

Use of data from the NCCCS Data Warehouse also provided this study with the unique opportunity to study the two research questions from the perspective of a large, statewide system. Each element in the database has a standard definition and is maintained and updated using a standard data collection protocol. Use of this data allowed for generalized statements to be made for an entire state rather than simply for one or a few colleges.

Summary

This chapter has presented the methodology used to examine the two research questions that guided this study: What are the degree attainment rates for African American males in selected CIP codes and what are the credential attainment gaps between African American males, African American females, white males, and white females in selected CIP code areas?

This chapter also described the study's research design. No active participants were

used in the study. Participants for the study were selected from the NCCCS Data Warehouse. Using data from the NCCCS Data Warehouse, a selected cohort of African American and white students who began their enrollment in the North Carolina community college system were tracked for a six-year period. Selected students were coded as completers if they earned a certificate, diploma, or degree during the study timeframe, or coded non-completer if a credential was not earned. The dependent variable of completer and the independent variables were stratified using propensity score analysis to remove confoundedness caused by variable multicollinearity. To answer the first research question, African American male completers were descriptively described by CIP code area. The second research question compared African American male completers to African American females, white males and white female completers. Version 19 of SPSS was used to analyze the data. The findings of the study are presented in Chapter Four.

Chapter Four: Findings

The purpose of this study was to examine the relationship between African American males enrolled in the North Carolina Community College System, their credential completion in selected CIP code areas, and the difference or credential attainment gap between African American male attainment compared with African American females, white males and white females in programs of study in the Arts and Sciences, Business Technologies, Engineering Technologies, and Health Technology programs identified by CIP codes. Propensity score matching was used to address multicollinearity caused by the possible relationship among variables of college size, student race, student gender, 2005 fall CIP code, the student's age in 2005, whether the student received a Pell grant, and if the credential earned by the student is different than the 2005 fall CIP code area.

This study addressed the following two research questions:

1. What is the relationship between the curriculum program area selected and degree attainment for African American males in the North Carolina Community College System?
2. What is the relationship between the degree attainment rates for African American males relative to white males, white females, and African American females?

The first research question was answered using descriptive statistics. The second research question was explored using logistic regression statistical analysis, crosstabs, and Chi-Square.

This chapter provides a profile of the participants and a description of the results for both research questions.

Sampling

Version 19 of the SPSS statistical software was used to generate descriptive statistics for this study. This section contains the characteristics of the population including student race, gender, and fall 2005 CIP area of study. For the purpose of comparisons, descriptive statistics are presented for African American males, African American females, white males, and white females.

The original sample for this study contained 42,856 students enrolled during the fall 2005 semester in all of the 58 North Carolina community colleges ($N = 42,856$). The students selected for this study had completed fewer than 12 college credits prior to their enrollment in the fall 2005 semester, were originally enrolled in a program of study in one of four CIP code areas—Arts and Sciences, Business, Engineering, or Health. Students in the selected cohort classified their race as African American or white, and their gender as male or female.

Fall 2005 Student Race and Gender

The original study sample included 3,282 African American males. These students were enrolled in CIP codes in one of four selected areas of interest to the study. This represents 7.7% of the sample size. A total of 8,608 students (20.1%) were African American female, 11,036 students (25.8%) were white males, and 19,930 students (46.5%) were white females (See Table 4.1).

Table 4.1

Fall 2005 Sample by Student Ethnicity and Gender

		<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
Valid	AA Male	3282	7.7	7.7	7.7
	AA Female	8608	20.1	20.1	27.7
	Wt Male	11036	25.8	25.8	53.5
	Wt Female	19930	46.5	46.5	100.0

Note. AA = African American; Wt = White.

Fall 2005 CIP Codes

A dummy code was created using the student's fall 2005 CIP code. The dummy code combines all of the CIP codes within an academic program area into one of the four program areas selected for this study (Appendix D). The CIP codes listed are not comprehensive. Only CIP codes containing Fall 2005 student enrollments were included in Appendix D. All of the CIP codes within the program area of Arts and Sciences were coded Arts/Sciences, Business codes were coded Business, Engineering Technologies were coded Engineering, and Health Technologies were coded Health. Of the students selected for the study, 54.9% ($n = 23,507$) were enrolled in a CIP code in the academic program area of Arts/Sciences, 23.0% ($n = 9,843$) of the students were enrolled in a Business CIP area, 3.4% ($n = 1,448$) were in Engineering, and 18% ($n = 8,058$) were in Health and (Table 4.2).

Table 4.2

Original Sample by 2005 CIP Code Area

<u>2005 CIP Code Area</u>	<u>Frequency</u>	<u>Percent</u>
Arts/Sciences	23507	54.9%
Business	9843	23.0%
Engineering	1448	3.4%
Health	8058	18.8%
Total	42856	100.0%

Student Age

Student age for the Fall 2005 semester was calculated by subtracting the student's year of birth from the academic year 2005. The mean age of all students in the sample was 26.58. African American males in Health had a mean age of 34.34 , and were the oldest student cohort group by age. In contrast, African American males enrolled in Arts/Sciences were the youngest of the African American student cohort groups at 23.45 years (Table 4.3).

College Size

The 58 North Carolina community colleges were categorized by size based on the 2012 Carnegie classification and the college's Fall 2005-Spring 2006 annual FTE enrollments. The largest cohort of African American males made up 21.7% of the enrollment of community colleges classified as very small. African American females were 27.2% of the enrollment of very large North Carolina community colleges. White males were 29.0% of the enrollment at large community colleges, and 51.2% of students at small

Table 4.3

Fall 2005 Original Sample by Ethnicity, Mean Age, and CIP Code Area

	<u>Arts/Sciences</u>	<u>Business</u>	<u>Engineering</u>	<u>Health</u>
AA Male	23.45	27.74	25.96	34.34
AA Female	26.67	31.41	28.58	31.38
Wt Male	21.77	27.76	26.15	32.95
Wt Female	24.13	31.10	29.33	29.53

Note. AA = African American; Wt = White.

community colleges were white females. White females represented the largest percentage of student enrollment in each of the Carnegie classification categories (Table 4.4).

Table 4.4

Fall 2005 Original Sample Ethnicity and Gender by College Size

	<u>Very Small</u>	<u>Small</u>	<u>Medium</u>	<u>Large</u>	<u>Very Large</u>
AA Male	21.7%	6.4%	7.1%	9.8%	11.4%
AA Female	11.7%	21.7%	17.8%	21.9%	27.2%
Wt Male	21.7%	20.7%	27.2%	29.0%	24.9%
Wt Female	45.0%	51.2%	47.9%	39.3%	36.5%

Note. AA = African American; Wt = White.

Sample Selection

In the original sample ($N=42,856$) African American males were 7.6% of the Arts and Sciences enrollment, 10.4% of the Business enrollment, 17.6% of the students enrolled in Engineering, and 2.6% of the Health enrollment. African American females were 17.6% of the Arts and Sciences enrollment, 25.5% of the Business enrollment, 3.5% of the Engineering enrollment, and 23.7% of the Health enrollment. White males were 29.9% of Arts and Sciences enrollment, 22.8% of the Business enrollment, 69.1% of the Engineering enrollment, and 9.3% of the enrollment in the Health CIP code area. White females represented 44.8% of the Arts/Sciences enrollment, 20.4% of the Business enrollment, 9.8% of the enrollment in the Engineering, and 64.4% of the Health enrollment CIP code area (Table 4.5).

Table 4.5

Original Sample by 2005 CIP Code Area, Ethnicity, Gender

<u>2005 CIP Code Area</u>	<u>Arts/Sciences</u>	<u>Business</u>	<u>Engineering</u>	<u>Health</u>
AA Male	7.6%	10.4%	17.6%	2.6%
AA Female	17.6%	25.5%	3.5%	23.7%
Wt Male	29.9%	22.8%	69.1%	9.3%
Wt Female	44.8%	20.4%	9.8%	64.4%
Total	100.0%	100.0%	100%	100%

Note. AA = African American; Wt = White.

Completers

From the original sample, 15,051 students completed a credential (certificate,

diploma, or associate degree) from North Carolina’s 58 community colleges within the six-year study period. African American males earned 4.0% of the Arts/Sciences credentials, 5.6% of the Business credentials, 12.6% of the Engineering credentials, and 1.6% of the Health credentials. African American females earned 11.5% of the credentials in Arts and Sciences, 26.3% of the credentials in the Business CIP code area, 2.2% in Engineering, and 19.1% in Health. White males earned 32.9% of the credentials in Arts and Sciences, 17.7% in Business, 72.6% of the credentials in Engineering, and 8.1% of the Health credentials. White females earned 56.1% of the Arts and Sciences credentials, 50.3% of the Business credentials, 12.6% of the Engineering credentials, and 71.2% of the Health CIP code area credentials (Table 4.6).

Table 4.6

Original Sample by Credential CIP Code Area, Ethnicity, Gender

	Arts/Sciences	Business	Engineering	Health
AA Male	4.0%	5.6%	12.6%	1.6%
AA Female	11.5%	26.3%	2.2%	19.1%
Wt Male	32.9%	17.8%	72.6%	8.1%
Wt Female	51.6%	50.3%	12.6%	71.2%
Total	100.0%	100.0%	100%	100%

Note. AA = African American; Wt = White.

Propensity Score Sample

Propensity score analysis was conducted to eliminate multicollinearity caused on the dependent variable of credential completion by the interaction among independent variables

of college size, student race, gender, 2005 CIP code, the student's age in 2005, whether the student received a Pell grant, and if the credential earned by the student is different than the Fall 2005 CIP. The analysis provided the opportunity for membership placement into the final sample without the influence of collinear independent variables upon the dependent variable of completer.

Using the logistic regression function of SPSS, propensity scores were calculated for each record in the data set ($N= 42, 856$) with completer as the dependent variable and the confounding variables mentioned earlier as the independent variables. The propensity scores, using visual binning, were stratified into five equal quintiles. Each stratum was inspected to determine the percent of completers and non-completers. Strata number four produced the most even distribution of records among the dependent variable completer. The scored sample included 7,246 records. Of these, 3,393 (46.8%) of the students selected using propensity scores were classified as completers, having earned a diploma, certificate, or an associate degree in Arts and Sciences, Business Technologies, Engineering Technologies, or Health Technologies within a six-year period. The number of students who did not earn a credential totaled 3,853 (53.2%). Because of the distribution of students in strata four (53.2% completer versus 46.8% noncompleter) the confounding variables placed little or no bias on credential completion, so the completion effect was isolated (Caliendo & Kopeinig, 2008). Strata number four was selected for the analysis (Table 4.7).

Table 4.7

Predicted Probability (Binned) by Credential Earned

		<u>Cred Earned</u>			
		<u>No Cred</u>	<u>Cred</u>	<u>Total</u>	
Predicted probability (Binned)	1	Count	6211	1019	7230
		% within Predicted probability (Binned)	85.90%	14.10%	100.00%
	2	Count	5313	1916	7229
		% within Predicted probability (Binned)	73.50%	26.50%	100.00%
	3	Count	4747	2482	7229
		% within Predicted probability (Binned)	65.70%	34.30%	100.00%
	4	Count	3853	3393	7246
		% within Predicted probability (Binned)	53.20%	46.80%	100.00%
	5	Count	1940	5275	7215
		% within Predicted probability (Binned)	26.90%	73.10%	100.00%
Total		Count	22064	14085	36149
		% within Predicted probability (Binned)	61.00%	39.00%	100.00%

Note. Cred = Credential

Comparison of Original and Propensity Scored Stratified Sample by Race and Gender

The stratified sample contained 7,246 records. African American males were 3.4% of the stratified sample, African American females were 19.9%, of the sample, 17.8% of the sample were white males, and 58.9% of the sample were white females (Table 4.8).

Table 4.8

Stratified Sample by Ethnicity and Gender

		<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
Valid	AA Male	246	3.4	3.4	3.4
	AA Female	1439	19.9	19.9	23.3
	Wt Male	1293	17.8	17.8	41.1
	Wt Female	4268	58.9	58.9	100.0
	Total	7246	100.0	100.0	

Note. AA = African American; Wt = White.

The propensity scored sample predicted 4.3% fewer African American males, 0.2% fewer African American females, and 8% fewer white males than were in the original sample. The propensity scored sample predicted a larger number of white females (12.4%) than were contained in the original sample (Table 4.9).

Table 4.9

Original compared to Stratified Sample by Ethnic Gender Code

-	<u>Original Sample</u>	<u>Propensity Sample</u>	<u>Difference (Propensity</u>
	<u>Percent</u>	<u>Percent</u>	<u>-Original) Percent</u>
AA Male	7.7	3.4	-4.3
AA Female	20.1	19.9	-0.2
Wt Male	25.8	17.8	-8
Wt Female	46.5	58.9	12.4
Total	100	100	

Note. AA = African American; Wt = White.

The propensity scored sample contained 9.2% fewer students in the Arts/Sciences, a greater percentage of students in Business (11.5%) and Engineering (2.5%) CIP code area, and fewer students in Health (-4.9%) CIP code area than was contained in the original sample (Table 4.10).

African American males represented 3.4% of the total propensity scored enrollment sample. African American males were .5% of the Arts/Sciences enrollment, 4.3% of the Business CIP code area enrollment, 12.6% of the Engineering enrollment, and 6.8% of the Health enrollment (Table 4.11). This compares to African American males representing 7.6% of the Arts/Sciences CIP codes, 10.4% of the Business enrollment, 17.6% of the Engineering enrollment, and 2.6% of the Health enrollment in the original sample. The propensity score sample will be used for the remainder of this study.

Table 4.10

Comparison of Original to Propensity Scored Sample by Fall 2005 CIP Area

		<u>Original</u> <u>Sample</u> <u>Percent</u>	<u>Propensity</u> <u>Scored Percent</u>	<u>Difference</u>
Valid	Arts/Sciences	54.9	45.7	-9.2
	Business	23.0	34.5	11.5
	Engineering	3.4	5.9	2.5
	Health	18.8	13.9	-4.9
	Total	100.0	100.0	100.0

Research Question One

Question number one of this study addresses the relationship between the curriculum program areas (major) selected and credential attainment for African American males in the North Carolina Community College System. Of the African American males who began their enrollment in Fall 2005, 106 earned a certificate, diploma or degree within six years. Of the sample students, 89 earned a credential in one of the study's four selected CIP areas. Additionally, 17 African American males that began their enrollment during Fall 2005 in one of the selected CIP area codes earned a credential in an area not selected for this study; Construction Technologies ($N = 13$), Industrial Technologies ($N = 1$), Public Service Technologies ($N = 1$) and Transport Systems Technologies ($N = 2$).

Of the 89 African American males that earn a credential, 7.9% of the credentials were in the Arts and Sciences CIP area, 44.9% in the Business area, 15.7% in the Engineering area, and 31.5% in Health (Table 4.12).

Table 4.11

Propensity Scored Sample by Ethnic Gender Code and Fall 2005 CIP Area

			<u>Fall 2005 CIP Area</u>				<u>Total</u>
			<u>Arts/Sciences</u>	<u>Business</u>	<u>Engineering</u>	<u>Health</u>	
EthnicGender Code	AA Male	% within fall 2005 CIP Area	0.5%	4.3%	12.6%	6.8%	3.4%
	AA Female	% within fall 2005 CIP Area	13.2%	26.6%	3.7%	31.8%	19.9%
	Wt Male	% within fall 2005 CIP Area	10.6%	17.2%	72.6%	19.9%	17.8%
	Wt Female	% within fall 2005 CIP Area	75.7%	51.9%	11.0%	41.4%	58.9%
Total		% within fall 2005 CIP Area	100%	100%	100%	100%	100%

Table 4.12

*African American Male Completers by CIP Area**

	<u>Count</u>	<u>Percent</u>
Arts/Sciences	7	7.9%
Business	40	44.9%
Engineering	14	15.7%
Health	28	31.5%
Total	89	100.0%

Note. *17 African American earned a credential in CIP area other than Arts/Sciences, Business, Engineering or Health.

The propensity scored sample underpredicted African American male completers in Arts/Sciences (0.5% to 4.0%) and in Business (4.3% to 5.6%). Both samples indicated a 12.6% completion rate in Engineering. The propensity scored sample overpredicted the completion rate for African American males in Health CIP areas (6.8% to 1.6%).

Research Question Two

The second question addressed by this study was to examine the credential attainment gap between student cohort groups selected. Using the propensity scored sample, the relationship between credential attainment rates for African American males relative to African American females, white males and white females was explored.

Table 4.13

*African American Male Completers Original Sample compared to Propensity Scored Sample
by CIP Code Area*

	<u>Original</u> <u>Sample</u>	<u>Propensity</u> <u>Sample</u>	<u>Difference</u>
Arts/Sciences	4.0%	0.5%	-3.5%
Business	5.6%	4.3%	-1.3%
Engineering	12.6%	12.6%	0%
Health	1.6%	6.8%	5.2%

African American Males versus African American Females

Of the African American females in the sample, 588 earn a credential in one of the study’s selected areas. Additionally, one African American female earned a credential in Biological and Chemical Technologies, two in Commercial and Artistic Production Technologies, three in Industrial Technologies, and 37 in Public Service Technologies.

When compared to African American males, African American females earned 93.2% of the credentials in Arts and Sciences, 88.6% of the Business credentials, 22.2% of the Engineering credentials, and 86.4% of the Health credentials (Table 4.13). The greatest credential attainment gap credential attainment gap between African American males and African American females is an 86.4% difference in the Arts/Sciences CIP area. The Pearson Chi-Square ($\chi^2 = 70.430, p < .005$) indicates a significant relationship among the variables.

Table 4.14

African American Male, African American Female Completers by CIP Area

			EthnicGender Code			CAG*
			AA Male	AA Female	Total	
High Degree CIP Area	Arts/Sciences	Count	7	96	103	-89
		% within High Degree CIP Area	6.8%	93.2%	100.0%	-86.4%
		% within EthnicGender Code	7.9%	16.3%	15.2%	-8.4%
	Business	Count	40	310	350	-270
		% within High Degree CIP Area	11.4%	88.6%	100.0%	-77.2%
		% within EthnicGender Code	44.9%	52.7%	51.7%	-7.8%
	Engineering	Count	14	4	18	10
		% within High Degree CIP Area	77.8%	22.2%	100.0%	55.6%
		% within EthnicGender Code	15.7%	.7%	2.7%	15.0%
	Health	Count	28	178	206	-150
		% within High Degree CIP Area	13.6%	86.4%	100.0%	-72.8%
		% within EthnicGender Code	31.5%	30.3%	30.4%	1.2
Total		Count	89	588	677	-499
		% within High Degree CIP Area	13.1%	86.9%	100.0%	-73.8%

			EthnicGender Code			CAG*
			AA Male	AA Female	Total	
High Degree CIP Area	Arts/Sciences	Count	7	96	103	-89
		% within High Degree CIP Area	6.8%	93.2%	100.0%	-86.4%
		% within EthnicGender Code	7.9%	16.3%	15.2%	-8.4%
	Business	Count	40	310	350	-270
		% within High Degree CIP Area	11.4%	88.6%	100.0%	-77.2%
		% within EthnicGender Code	44.9%	52.7%	51.7%	-7.8%
	Engineering	Count	14	4	18	10
		% within High Degree CIP Area	77.8%	22.2%	100.0%	55.6%
		% within EthnicGender Code	15.7%	.7%	2.7%	15.0%
	Health	Count	28	178	206	-150
		% within High Degree CIP Area	13.6%	86.4%	100.0%	-72.8%
		% within EthnicGender Code	31.5%	30.3%	30.4%	1.2
Total		Count	89	588	677	-499
		% within High Degree CIP Area	13.1%	86.9%	100.0%	-73.8%
		% within EthnicGender Code	100.0%	100.0%	100.0%	

*CAG=Credential Attainment Gap (African American male vs African American female)

Table 4.15

Chi-Square Test African American Males, African American Females by Credential

Attainment

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	70.430*	3	.000

Note. *Cell (12.5%) has an expected count less than 5. Minimum expected count is 2.37.

African American Males versus White Males

Of the white males in this study, 635 earned a credential. Of the credentials, 584 were earned in the study's selected CIP code area. Another 11 white males that began their Fall 2005 enrollment in one of the study's CIP code areas earned a credential in Agricultural and Natural Resources Technology, three in Biological and Chemical Technologies, three in Commercial and Artistic Production, 19 in Construction Technologies, 27 in Industrial Technologies, 20 in Public Service Technology, and three in Transportation Systems.

When compared to African American males, white males earned 95.5% of the Arts/Sciences credentials, 80.2% of the Business credentials, 90.4% of the Engineering credentials, and 79.1% of the Health credentials. The largest credential attainment gap was observed between African American males and white males in the Arts/Sciences CIP code area (Table 4.15). The Pearson Chi-Square ($\chi^2 = 24.920, p < .005$) indicates a significant relationship among the variables (Table 4.16).

Table 4.16

African American Male, White Male Completers by CIP Area

			EthnicGender Code		Total	CAG*
			AA Male	Wt Male		
High Degree CIP Area	Arts/Sciences	Count	7	148	155	-141
		% within High Degree CIP Area	4.5%	95.5%	100.0%	-91%
		% within EthnicGender Code	7.9%	27.0%	24.3%	-19.9
	Business	Count	40	162	202	-122
		% within High Degree CIP Area	19.8%	80.2%	100.0%	-60.4%
		% within EthnicGender Code	44.9%	29.6%	31.7%	15.3%
	Engineering	Count	14	132	146	-118
		% within High Degree CIP Area	9.6%	90.4%	100.0%	-80.8%
		% within EthnicGender Code	15.7%	24.1%	22.9%	-8.4%
	Health	Count	28	106	134	-78
		% within High Degree CIP Area	20.9%	79.1%	100.0%	-58.2%
		% within EthnicGender Code	31.5%	19.3%	21.0%	12.2%
Total		Count	89	548	637	-459
		% within High Degree CIP Area	14.0%	86.0%	100.0%	-72%
		% within EthnicGender Code	100.0%	100.0%	100.0%	

*CAG = Credential Attainment Gap (African American male attainment vs. white male attainment). *Note.* AA = African American; Wt = White.

Table 4.17

Chi-Square Test, African American Males, White Males

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	24.920*	3	.000

Note. *0 cells (.0%) have expected count less than 5. The minimum expected count is 18.72.

African American Males versus White Females

Of the white females in this study, 2,022 earned a credential. Of those, 1,919 credentials were in the study's selected CIP code area. Four white females who began their Fall 2005 enrollment in one of the study's CIP code areas earned a credential in Agricultural and Natural Resources Technology, seven in Biological and Chemical Technologies, 12 in Commercial and Artistic Production, one in Construction Technologies, seven in Industrial Technologies, 71 in Public Service Technology, and one in Transportation Systems.

When compared to African American males, white females earned 99.1% of the Arts/Sciences credentials, 93.3% of the Business credentials, 62.2% of the Engineering credentials, and 95.3% of the Health credentials. The largest credential attainment gap between African American males and white females is 98.2% in the Arts/Sciences CIP code area (Table 4.17). The Pearson Chi-Square ($\chi^2 = 128.009$, $p < .005$) indicates a significant relationship among the variables (Table 4.18).

Table 4.18

African American Male, White Female Completers by CIP Area

			EthnicGender Code		Total	CAG*	
			AA Male	Wt Female			
High Degree CIP Area	Arts/Sciences	Count	7	773	780	-766	
		% within High Degree CIP Area	.9%	99.1%	100.0%	-98.2%	
		% within EthnicGender Code	7.9%	40.3%	38.8%	-32.4	
Business		Count	40	554	594	-514	
		% within High Degree CIP Area	6.7%	93.3%	100.0%	-86.6%	
		% within EthnicGender Code	44.9%	28.9%	29.6%	16	
Engineering		Count	14	23	37	-9	
		% within High Degree CIP Area	37.8%	62.2%	100.0%	-24.4%	
			% within EthnicGender Code	15.7%	1.2%	1.8%	14.4%

			EthnicGender Code			CAG*
			AA Male	Wt Female	Total	
High Degree	Health	Count	28	569	597	-541
CIP Area		% within High Degree CIP Area	4.7%	95.3%	100.0%	-90.6%
		% within EthnicGender Code	31.5%	29.7%	29.7%	1.8%
Total		Count	89	1919	2008	-1830
		% within High Degree CIP Area	4.4%	95.6%	100.0%	-91.2%
		% within EthnicGender Code	100.0%	100.0%	100.0%	

*CAG = Credential Attainment Gap (African American male attainment – white female attainment).

Table 4.19

Chi-Square Test, African American Males, White Females

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	128.009*	3	.000

Note. *1 cell (12.5%) has an expected count less than 5. The minimum expected count is 1.64.

Summary

From the original sample, 42,856 students were analyzed using propensity scores to eliminate multicollinearity. The resulting sample of completers ($N = 3,393$) was used to describe the relationship between African American males and the CIP areas of interest for this study. The propensity scored sample underpredicted African American male completers by 4.3%.

Of the African American males in the stratified sample selected for the study, 3.4% earned a credential in one of the areas of interest. Of the African American male completers, 0.5% earned a credential in Arts/Sciences, 4.3% of the credentials earned were in Business, 12.6% in Engineering, and 6.8% of the credentials earned were in Health. African American males were least likely to earn a credential in Arts/Sciences, Business, and Health. African American males were most likely to earn a credential in an Engineering CIP code area.

When comparing African American males to other student groups in the sample, African American males were least likely to earn a community college credential in any of the CIP areas selected for this study with one exception. When compared to African American females, African American males earned 6.8% of the Arts/Sciences credentials

compared to 93.2% earned by African American females. The credential attainment gap of 86.4% was the largest credential attainment gap when comparing these two groups. African American males earned 77.8% of the Engineering credentials compared to 22.2% of the Engineering credentials earned by African American females. This is the only cell in the analysis where African American males outperformed any of the comparison groups.

When compared to white males, the greatest credential attainment gap (-91.0%) for African American males occurred in the Arts/Sciences CIP code area. African American males did not attain a credential at greater or equal rates to white males in any of the areas selected for this study.

African American male credential attainment was lower than that of white females in each of the four CIP areas selected for this study. African American males had the lowest performance in the CIP area of Arts/Sciences (-98.2%) when compared to white females.

Chapter Five: Analysis

Introduction

This quantitative study examined the relationship between CIP code areas and credential attainment for North Carolina community college African American males enrolled in Arts and Science, Business Technology, Engineering Technology, and Health Technologies. This study also examined the credential attainment gap between African American males and African American females, white males, and white females.

Chapter Five provides an analysis of the major findings of the study, describes the limitations, revisits the conceptual framework used in the study, identifies implications from the study, and provides suggestions for future research.

Analysis

This persistence study examined two questions: What is the relationship between the curriculum area selected and degree attainment for African American males in the North Carolina Community College System? The second question was: What is the relationship between the degree attainment rates for African American males relative to other selected student groups not classified as African American males?

The independent variables of college size, race, gender, Classification of Instructional Program code, student age, whether the student received a Pell grant, and whether the student changed their CIP code were significant ($p < .01$) in determining student completion for African American males, African American females, white males, and white females. Felderman (1993) indicated that student age, race and gender were factors that contributed to

student persistence. This study used propensity score analysis to select a subset of students from those who began their enrollment at a North Carolina community college during the Fall 2005 semester. Propensity scores were used to address interaction among the variables.

The primary finding of this study for question one was that African American males enrolled in the North Carolina community college system earn credentials at different rates in Arts/Sciences, Business, Engineering and Health CIP code areas. The primary finding of this study for question two was that African American males enrolled in the North Carolina community colleges selected for this study earned fewer credentials (certificates, diplomas, or certificates) than African American females, white males, or white females.

African American Male Credential Attainment Gap

The gap in academic achievement between African American (as well as Latino) children and their white peers is arguably the most important of all educational problems in the U.S. This gap which appears early in elementary school, develops into differences in high school graduation rates, college attendance and completion, and ultimately, the differences in income and socioeconomic status (SES) that underlie the most critical social inequities. (Slavin & Madden, 2006, p. 389)

There are significant credential attainment gaps between African American males and African American females, African American males and white males, and African American males and white females enrolled in North Carolina community colleges by CIP area. This study describes two credential attainment gaps for African American males. The gap that exists between African American males enrolled in different CIP code areas and the credential attainment gap between African American males and other student groups of interest to this study.

The largest credential attainment gap exists between African American males and white females enrolled in the Arts/Sciences CIP area. When compared to African American males, 98.2% of the credentials in this CIP area were earned by white females, while less than 1% were earned by African American men.

The most narrow credential attainment gap existed between African American males and white females in the Engineering CIP area, where both student groups earned about 11% of the credentials completed in that CIP area.

This study contradicts Fike & Fike's (2008) findings that race and gender were not significant in predicting student persistence. However, the findings of this study are consistent with Felderman (1993) that posits age, gender, and race being identified as a minority other than Asian has an impact on student persistence.

Limitations of the Study

This study contained several limitations. First, the study excluded students enrolling in the community college with 12 or more hours of college credits. Students can earn college credits by participating in programs such as college transfer, Huskins (dual enrollment) Advanced Placement (AP), and Cooperative and Innovative High School Credits. These students have the potential to earn community college credentials in an accelerated manner and at higher rates because they earn college credits while still enrolled in high school or by transferring into the community college from other post-secondary institutions. Indoctrination to the rigors of the college curriculum programs and campuses may also provide these students with an advantage and give them a head start toward credential completion.

The second limitation is the fact that college transfer students were not included in

this study. Students that began their enrollment at the community college and left the community college system before earning their credential were not included in this study as completers. The number of students that transfer from the community college and into the university that complete four-year degrees is relatively small. While 73% of community college students indicate that they intend to transfer to a senior college or university, only 45% ever obtain their goal (Center for Community College Student Engagement, 2012).

The third limitation of this study is that some programs have selective admissions requirements. Selective admissions programs have a limited number of seats or slots in the program. These programs require students to complete preenrollment experiences such as completing a certified nurse assistant course or rigorous courses such as anatomy and physiology before enrolling in the CIP code. Most of the programs in the Health Technology CIP code are selective admission programs. The students in Health may complete programs and earn credentials at a higher rate than other programs offered at the college because students selected for enrollment are not entering the program under the open door admissions practices, but are prescreened for admissions and may be better academically prepared and more highly motivated to earn their credential and enter the workforce. Another observation regarding students enrolled in Health is that most programs are cohort based full-time enrollment programs. Students enroll into the cohort and complete a prescribed set of classroom and clinical experiences. There is little to no course selection or elective credit for students to select. This is consistent with research that suggests that community college students who begin their programs early and complete nine hours of college credit have a greater probability of earning a credential (Jenkins & Cho, 2011).

A fourth limitation to the study is that the sample is from one community college

system. The results of the study may not be generalizable to other college types such as four-year institutions or community colleges located in other states.

Finally, the use of students participating in the Federal Pell grant program may not be an equivalent proxy for the social economic status of the sample. Some students may not complete the application for aid because of the complexities in completing the forms or they may not be aware of their eligibility for financial assistance.

Revisiting the Conceptual Framework

Social and academic integration is an important aspect of college student success. This study used Tinto's (1993) Model of Voluntary Student Departure to evaluate the success of African American male credential attainment by CIP area. The formal academic component of Tinto's model shows a relationship between academic performance and faculty and staff interactions with the student (Figure 2.1). Factors that impact students leaving college may be the same for all students, but Tinto (1993) posits that the factors are magnified for minority students. Researchers found that Tinto's model was viable for community college students as well as nonresidential college and university students (Karp, et al., 2011).

This study found that there were attainment gaps among student groups based on race and gender enrolled in North Carolina community colleges in the four CIP areas. African American males attained credentials in Business and in Health CIP areas at greater percentages than in the Arts/Sciences and Engineering areas. This may be due to differing quantity and quality of formal interactions among African American males and faculty and staff in these CIP areas. Males that are academically and socially integrated into the community college are more likely to persist to attain their bachelor's degree. The converse

is also true. Males who are not engaged may not persist (Pascarella et al., 1986).

Bers' (1988) study suggests that college faculty may contribute to differences in student persistence. Faculty who developed relationships, knew students by their names, and connected the students to the program and college had a positive impact on student performance. Program enrollments may not allow this type of interaction in all CIP areas (Bers, 1988). The large number of student enrollments in Arts/Science CIP area may contribute to the lack of success defined as credential attainment for African American males in this CIP area.

Perhaps Tinto's (1993) student persistence model could be enhanced for African American males by turning a wider lens to the variables of CIP code area, race, and gender. African American males in the North Carolina community college system enrolling in CIP area in Business or Health have a greater probability of persisting to credential completion and students enrolling in Arts/Sciences have the least probability of persisting to credential completion.

One suggestion to strengthen Tinto's model as a tool to assist college administrators in guiding African American males to credential completion would be to insert CIP code area selection between the Goal/Commitment and Institutional Commitment columns of Tinto's Model of Voluntary Student Departure. The selection of a CIP area code occurs prior to the student's enrollment at a North Carolina community college. Since most African American male students enrolling in the community college are first generation students, interventions to assist these students navigate the complex decisions necessary to persist to credential completion could enhance Tinto's model. Additionally, drawing from current research on bounded rationality and bounded self-control, interventions should be developed to help

African American male students make better-informed decisions regarding the selection of a program of study (Scott-Clayton, 2011). Therefore it is important to work with African American males and provide them with the support necessary to clearly define their college enrollment intent and then more closely align their intent with desired outcomes. Students who want to earn a community college credential versus desiring to transfer to a university are just two examples of differing student intent.

Implications

Given the attainment gaps that this study found, there are implications for community college funding, African American male credential attainment, academic advising, community college faculty, and for college policy makers.

Implications for community college funding. The results of this study can be beneficial for community college funding. North Carolina community colleges are currently funded based on a budget full-time equivalent (FTE) model. In 2012, North Carolina community colleges received \$5034.50 in state funding for each FTE. If community colleges would provide African American males with credential completion information by CIP code areas African American males could make better CIP code area choices. When African American males make better CIP code area choices they are retained and complete credentials at higher rates. Higher persistence and completion rates will allow the community college to garner additional state funding to support the college's operations. Additionally, it is cheaper to retain currently enrolled African American males than it is to recruit new students. Therefore, if the college is to grow its enrollment, the college must recruit two students for each student that it loses.

Implications for African American male credential attainment. The results of this

study showed that North Carolina community college credential attainment rates for African American Males would increase if they made better informed decisions about their CIP code area. Currently, African American males complete an application for admission to the community college. Federal financial aid grant requirements and statewide community college system regulations require students to choose a program of study prior to enrolling at the college. Unfortunately, some African American males make this decision without receiving adequate academic or career counseling. Results from this study show that significant differences exist in credential attainment rates between Arts/Sciences, Business, Engineering, and the Health CIP code areas. If African American males received advising and career counseling to move from a CIP with lower credential attainment rates to one with higher attainment rates, the completion rate for African Americans would improve the overall completion rate of African American males. Additionally, the results of this study provide not only African American males, but also African American females, white males and white females with new information about credential attainment by CIP code areas. This study's degree attainment information, coupled with career counseling and academic advising information could increase the North Carolina community college credential attainment rates not only for African American males but other student cohorts in this study.

Implications for academic advising. This study's findings have implications for student academic and career counseling. Community college students select a program of study during the community college admission process. Students may choose academic programs without enough information about academic requirements and the rigors of the program. According to Scott-Clayton (2011) community college students have difficulty making good decisions regarding selecting a program of study. The quality of assistance

providing students with help in the decision making process is low. Most advice given during a session between a student and a community college counselor is usually about the mechanics of selecting college courses and building a course schedule. Some students use family members and peers to compensate for the lack of guidance from professional staff (Scott-Clayton, 2011). But since many African American males enrolled in North Carolina community colleges are first generation they may not have information networks outside of the college to supplement the lack of information about navigating the decision making process (Scott-Clayton, 2011). Because North Carolina community colleges are open door institutions, students can select academic programs of study and change programs of study without consequences (Bers, 1988). Research from consumer sciences indicates that individuals have difficulty making complicated, long-term high stakes decisions. Individuals also have difficulty sorting out all of the important factors, gathering information, and appropriately weighing the costs and the benefits (Scott-Clayton, 2011). African American males may require additional advising regarding the rigors of programs in the CIP areas that yield few African American male credential completers. College student transition programs, orientation sessions, and study skills classes may also increase African American male credential attainment in these programs (O'Banion, 2012). In addition, career counseling and academic advising sessions that integrate tools such as academic ability and career assessments, which provide African American males with a more realistic appraisal of their abilities and challenges, would help African American males make more informed CIP code area decisions. The results from this study, co-presented to African American males with traditional academic and career counseling information can lead to an increase in African American male credential attainment.

Students must have clear, narrow pathways that align their academic and career goals. African American males enrolled in the community college are less academically prepared for the rigors of college than their peers. These students require academic remediation before they can enroll in college level courses. According to Jenkins and Cho (2011), community college students have a large number of academic programs to choose from. But because most students come to the college with academic deficiencies and without clear academic and career goals, they begin their academic program in remedial or developmental education. These developmental educational pathways usually do not provide well-defined pathways to college level programs of study. Most community colleges do not provide adequate counseling and guidance for these students (Jenkins and Cho, 2011).

At every stage of the student's experience with a college—connection, entry, progress, and completion—community college practices are often not well designed and aligned with one another to facilitate entry into and completion of a program of study as soon as possible. (Jenkins & Cho, 2011, p. 19)

African American males may benefit from enrolling in a CIP area that has clear, well-defined pathways to a career goal or job. Programs of study in the Business, Engineering, and Health Technology CIP codes have fewer elective courses than programs in the Arts/Sciences CIP area. In the Health CIP code area, students attend classes in cohorts, have specific job outcomes and work closely with their peers, community college faculty, academic advisors, preceptors, and clinical staff.

Implications for community college faculty. This study found several implications for community college faculty. Student engagement has become an important component of current conversations regarding community college student success. Engagement can be

defined as how community college students contribute to and participate in their educational experiences. How often and for what purpose they interact with faculty, which community college services they choose to use, which activities they take part in and how they spend time with other students, are all factors that determine their level of engagement (McClenney, 2007). The Community College Survey of Student Engagement was an instrument developed in 2001 to gauge community college student engagement (McClenney, 2007).

The first implication for community college faculty is that this study informs faculty in academic programs of the credential attainment rates for African American males. The study's results also describe the gaps that exist between different student cohorts by race and gender.

Secondly, CIP code areas with lower completion rates for African American males such as Arts/Sciences, Engineering, and Health may consider developing tools and teaching techniques to increase the level of classroom engagement of African American males. Improved interaction between students and faculty may be one tool to address African American male completion and close the credential attainment gap between African American males in Business CIP and other CIP code areas. According to Austin (1993), other than peer-to-peer mentoring, the quality of the interaction between the student and the faculty member had the most significant impact on student success. This student-to-faculty interaction has a positive impact on every aspect of student achievement, including grade point average, achieving academic honors, and credential attainment (Austin, 1993). O'Banion (2012) in a presentation to the American Association of Community colleges indicated that one component of increasing student completion is to ensure that students

develop at least one significant relationship with someone at the campus as early as possible (O'Banion, 2012). For community college students this relationship can be between the African American male student and their faculty member.

The third implication for Arts/Sciences faculty, administrators, and staff is that they should examine why a discrepancy exists between African American males enrolled in the Arts/Sciences CIP coded areas and the other CIP areas in the study. An increase in African American male credential attainment in this area would be significant for the enrollment growth of the community college. Arts/Sciences faculty, administrators, and staff should work with business faculty to develop practices to improve African American male degree attainment.

A fourth implication of this study is that if student engagement is needed to improve African American male attainment, and engagement is to take place in the community college classroom, it is imperative that the role played by adjunct faculty (part-time) in providing educational instruction in North Carolina community colleges is well understood. While adjunct faculty brings fresh experiences from the world of work into the classroom and serves as subject matter experts, their training is usually in a subject area or discipline, and not education. While colleges provide professional development activities for adjunct faculty, it may be difficult to hold adjunct faculty to the same requirements for professional development as the college requires for its full-time faculty. Engaging community college faculty in professional development presents some unique challenges. North Carolina community colleges employ a large number of adjunct faculty who bring relevant work experiences and subject matter expertise into the classroom, but are only employed by the college to teach a limited course load. In 2011, 57.6% of 13,847 North Carolina community

college curriculum faculty were part-time. In addition, most adjunct faculty members do not have educational pedagogical training, and community colleges have limited resources to provide professional development for these faculty. If North Carolina community colleges are to improve credential attainment rates for African American males, the college must commit to providing training for all faculty and staff. This includes finding ways to provide incentives for adjunct faculty to participate in professional development activities that provides training to better engage students, particularly African American males both in and outside of the classroom.

A fifth implication of the this study's results is that adding African American context and relevance to the community college curriculum may also support and increase African American male success. Academic curricula are diverse, and community colleges should consider implementing new curricula designs that meet the needs of the race and gender diversity in the classroom (Bers, 1988). Cultural relevant curricula designs should be a component of professional development for community college faculty.

Arts/Sciences faculty, working collaboratively with faculty from CIP code area that produce a greater number of African American male completers may yield effective practices that could be replicated across the college. According to Jenkins and Cho (2011), Colleges should empower faculty to work across academic divisions to address issues regarding student completion and success.

Building learning communities and peer workgroups in the classroom may also increase African American male student success. Building shared experiences with students that have similar goals creates a potential network of support for the students who participate (College Board, 2010).

According to a recent publication from The College Board (2011), in order to increase college credential attainment, men of color need to be engaged in the college classroom. The community college curriculum may have little relevance for minority males. And, according to the College Board, men of color bring low expectations with them into the college classroom. Just increasing the college going rate does not increase college completion rates. To increase the completion rates for men of color, colleges should consider increasing the venues and methods that these students can access the types of assistance they need to be successful. When the services available to students are dense, they are more likely to take advantage of and benefit from the services. When the services are scarce, students must become adept at seeking them out for themselves (College Board, 2011).

Karp, et.al (2011) suggests that student engagement for community college students can occur in the classroom. According to Tinto: “If we are going to make a substantial dent in completion rates, we must ask, ‘How can we reshape students’ experience in the one place where they will be while they are on campus: in the classroom?’” (Center for Community College Student Engagement, 2012, p. 2).

Implications for college policy makers. Community college administrators should evaluate college policies and procedures to encourage the engagement of African American males. This could be accomplished by increasing the number of African American male faculty and staff in the classroom and on the campus.

It is important to examine the role African American faculty can add and should play on predominantly white college campuses, because the extent to which African American faculty can provide support and mentoring to the African American students determine the ease of their transition to the predominantly white college

environment. (Malone & Malone, 2001).

Bush and Bush (2010) suggest eight strategies that community college policy makers should implement to improve the college completion rates for African American males. They include:

- designing programs that are designed specifically for African American men
- forming student-to-faculty mentoring programs
- designing new student orientation programming for African American men
- hiring African American faculty and staff that will provide support for African American men
- building learning communities and student cohort groups
- integrating African American culture into the curriculum
- using campus activities to encourage African American male integration, and
- implementing peer-mentoring programs (Bush & Bush, 2010).

However, without external pressure from students and their families, laws that require improved outcomes for African American males, or college funding attached to increased achievement outcomes for students there may not be incentive enough to address the credential attainment gap at community colleges (Bush & Bush, 2010).

Some research suggests that racism may play a role in the college's inability to provide equal opportunity for African American males or other minority students to earn a credential. Critical Race Theory (CRT) argues that hegemonic forces are at play at intuitions that favor white students over their nonwhite peers. CRT also believes that racism is so intertwined in American society that it is natural and normal in the United States. CRT also suggests that deficit language is another tool used to depress student performance. During

the course of this study, much literature regarding African American male degree attainment was found that was filled with deficit language. African American males were described as lagging, lacking, in crisis, and behind all other students (Landson-Billings, 1998).

While Gosman et al. (1983) were unable to make conclusions about race as a variable which influences student persistence, they did suggest that colleges should rethink and redesign retention and counseling programs to improve the academic performance and persistence rates of all student populations served by the institution. It is critical that interventions continue to be designed that impact the success of individual student populations. Best practices for one student population may not serve all students well (Carter, 2006). North Carolina community colleges may benefit by developing programs that assist African American males in making CIP program area choices that better align their academic abilities and work goals with programs that provide them with a greater probability of persistence to completion.

While much has happened, such as minority-male mentoring programs on community college campuses to support African American male student success, not much has changed with credential completion and degree attainment rates for these students. “The perception that there is a crisis in black men’s education in the United States is not unwarranted. Clearly, African American males are the most disadvantaged of the four population groups studied here” (McDaniel et al., 2009, p. 31). Perhaps current student support programs should be evaluated to determine if adequate student support services such as faculty mentoring, academic advising, career counseling, and career planning are core components of programs that target African American male student success.

Colleges and universities may also want to reconsider their admission and intake

policies for community college transfer students. Four-year colleges and universities that accept community college students who have not completed a credential remove the incentive for students to stay enrolled at and earn a credential from the community college (Bers, 1988). While universities have extensive orientation and support services for new freshmen, they may not have equivalent services to support students transferring into the institution.

Community colleges may also need to have a dialog about student success. Students who leave the institution without completing a degree or earning a credential are labeled as noncompleters. Some of these students may have enrolled at the college without the intent of earning a credential, but instead are taking courses for personal development and growth, seeking additional job training for a promotion, or are qualified to transfer to the university after completing a few semesters of coursework. While these students are not completers, they may have achieved all or a portion of their post-secondary educational goals from the community college.

North Carolina community colleges may wish to consider the following if they desire to improve the academic attainment rates of African American students, in particular African American males. According to Leinbach (2005):

1. Community colleges should monitor student attainment rates by race and gender among other student characteristics.
2. State and national research needs to be completed to identify points in the enrollment process such as developmental education programs and transition from developmental to college level courses.
3. Colleges should identify and provide best practice approaches to assist African

American males overcome financial, social, family, and academic barriers.

4. Community colleges should re-evaluate the academic advising process and provide African American males with information to guide them so they make informed decisions about CIP program of study selection.
5. Colleges should research dual enrollment programs as a tool for improving credential attainment for African American males (Leinbach, 2005).

Jenkins and Cho (2011) suggest community college administrators should challenge their presidents and top academic and student support services administrators to consider the following when addressing the issue of student credential attainment:

1. Are the academic programs offered at the college and all of the options and completion requirements for program completion clearly outlined for new students? Are there adequate academic advising, counseling, and other student support services to help new students, particularly first generation African American males navigate the educational pathways?
2. Is student progression and skill mastery being monitored by the college? How does the community college know that students are learning what is being taught in the classroom?
3. Are community colleges working collaboratively with four-year colleges and universities to ensure program alignment so any student who wants to further their education can do so seamlessly?
4. Are community colleges working with business and industry to determine that training offered by the college aligns with the needs of the workforce and that employment opportunities exist for students who attain these skills?

5. Can programs of study at the community colleges be consolidated to a smaller number of pathways, each having clear outcomes leading to credential attainment?
 6. Provide detailed program of study maps that provide students with a proscribed pathway of sequenced courses that lead to credential completion, with limited electives.
 7. Communicate regular with employers and transfer institutions to make sure alignment exists between the two partners, and
 8. Communicate with graduates to gather suggestions for program improvement.
- (Jenkins & Cho, 2011)

O'Banion (2012) suggests six core components that should be incorporated into a student success strategy. First, students should make a significant connection with someone on the college campus as soon as possible. Perhaps African American males in this study enroll in Business CIP code areas were able to connect with the faculty or staff in their programs more easily than African American males enrolled in the other CIP code areas of interest to this study.

Also, the development of key programs to assist students' transition into the college should be mandatory (O'Banion, 2012). New student orientation programs, academic advisement, study skills, and time management programs should be integrated into any program designed to improve community college student completion.

All students should begin their enrollment in a program of study (O'Banion, 2012). Perhaps African American males could benefit from intensive academic advising and career counseling prior to selecting a program of study, particularly prior to selecting a program of

study in a CIP program areas where African American earn the fewest credentials.

Students academic behaviors and performance, particularly African American males should be closely monitored (O'Banion, 2012). Their behaviors such as class attendance, classroom participation, homework completion, and academic grades should be tracked and documented. Appropriate interventions should be developed by the community college to assist students with difficulties get back on track with the goal of persistence and completion. O'Banion (2012) also goes further to suggest that evidence-based decision making should be employed regarding policy and program development.

Finally, all of the stakeholders at the college should have the opportunity to engage in professional development activities that center around student success and completion (O'Banion, 2012). This is challenging for North Carolina community college because of the large number of adjunct and part-time faculty.

While the suggestions listed above may provide opportunities to increase credential completion and narrow the credential attainment gap between African American males and other community college student groups, there are college challenges and barriers presented by each. First, interventions take both time and resources, and even when successful in small pilots may be difficult to operate on a large scale. According to Scott-Clayton (2011) a straightforward intervention to deal with the complex issues navigating the community college experience is to improve the academic advising process, but most colleges do not have the means to bring high-touch, intensive advising programs to the whole campus, but such strategies may be feasible for at-risk populations. Secondly, interventions require commitment from an institution perspective. Everyone on the campus from the college president to the administration, faculty, and staff must make a commitment to student

success. Thirdly, during tough budget times colleges may find it difficult to identify personnel and financial resources to support new initiatives.

Suggestions for Future Research

As a result of this study, four suggestions for future research in the area of educational attainment for community college students, particularly for African American males, are highlighted.

While more research in this area is certainly needed, the biggest challenge in better serving minority college students is not creating new knowledge about how to help them; it is creating new incentives for institutional leaders to act on the knowledge that already exists. Their current indifference is rooted in many areas—funding, governance, market pressures, accountability, and lack thereof. (Carey, 2008, p. 13)

The first recommendation is a qualitative inquiry regarding African American males and the relationship between CIP code and college completion. While the quantitative data provided in this study describes the relationship between race, ethnicity and CIP codes, a survey of and interviews with African American male students who either earn or do not earn a credential from a North Carolina community college may provide deeper insight into student behavior about how and why CIP selection decisions are made. Also, administering a survey instrument such as the Community College Survey of Student Engagement to determine academic and social integration of African American male completers may provide additional insights into the differences of completion rates by CIP program areas. This additional study may inform college administrators responsible for making decisions regarding customization of the curriculum and implications for designing more effective new student orientation and advising interventions for African American males prior to the

selection of a major.

Secondly, in future investigations, comparisons between individual CIP codes within CIP program areas by gender and race will provide more insight into the differences between CIP codes themselves. This study describes the educational attainment gaps within a broad program or CIP area. Significant educational attainment gaps for African American males may also exist within CIP code program areas.

Thirdly, an additional area of investigation would be to compare findings from this study African American male credential attainment rates in other states with large community college systems. Consistent findings among several state level data sets could provide the foundation for a national dialog around African American male community college student credential attainment.

Fourth, a future study of credential attainment for African American males by CIP code area and faculty type may be warranted. Significant attainment differences for African American males taught by full-time community college faculty versus students taught by part-time faculty may assist college decision makers in providing professional development for adjunct and part-time faculty.

Summary

From 2005 to 2010 African American male enrollment in North Carolina community colleges grew by 31%. Although more African American males have access to and are pursuing a community college education, few African American males are being successful as defined by attaining a certificate, diploma, or a degree from a North Carolina community college. Even after investments of state and federal dollars into programs such as the North Carolina community college's Minority Male Mentoring Program, African American males

are the least likely of all student populations to earn a certificate, diploma or a degree.

According to Belfield and Levin:

A person's educational attainment is one of the most important determinants of his or her life chances in terms of employment, income, health status, housing, and many other amenities. Unlike other attributes, such as family background and personal characteristics, educational attainment can be chosen by the individual and influenced by public policy. In the United States we share a common expectation that all citizens will have access to high quality education that will reduce considerably the likelihood of later lifetime inequalities. Yet large differences in educational quality and attainment persist across income, race, and region. Even with similar schooling resources, educational inequalities endure because children from educationally and economically disadvantaged populations are less prepared to start school. They are unlikely to catch up without major educational interventions on their behalf. (Belfield & Levin, 2007, p. 1)

African American males enrolled in North Carolina community colleges attained fewer credentials than any other student group selected in this study. "Far too many black males get burned by a complex stew of social forces that includes low expectations, lack of good role models, and poverty" (Dyer, 2005). As a cohort, African American males are most likely to earn a credential in Business CIP code area and least likely to earn a credential in Arts/Sciences. When compared to other student groups the greatest credential attainment gap was in the Arts/Science CIP code area.

The study's results have implications for African American males enrolled in the North Carolina Community College System, and also for community college advisors,

faculty, staff ,and college policy makers. Additional research regarding credential attainment and African American male students should be conducted. This study also suggests a review of credential attainment by individual CIP codes and qualitative studies regarding faculty-student interactions by CIP code areas.

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APPENDIX A

North Carolina Community College System
Curriculum/Continuing Education Information System
Curriculum and Continuing Education Student Enrollment by College
Table 1 Annual

Reporting Year: 2009 - 2010

Last Refresh on : 10/15/10

College	Curriculum					Continuing Education											Total
	Assoo	Dipl	Cert	Trans	Curr Sub	Baso Skills	Learn Lab	Ooo RB	Ooo Ext 88	FTT	HRD	NIT/ET	SBC	Comm Svo	Non Ooo 88	CE Sub	
Alamance CC	5,273	461	405	1,395	7,352	2,763		4,770	429	43	351		339	120	1,080	9,280	16,206
Asheville-Buncombe TCC	5,901	439	330	4,349	10,757	3,804		6,288	1,056	355	1,849	443	953		2,981	16,273	26,050
Beaufort County CC	1,890	204	113	357	2,526	906		2,917	144		312		393		305	4,758	7,088
Bladen CC	1,955	134	45	164	2,263	748		1,365	105	15	501	75	60		561	2,946	4,985
Blue Ridge CC	2,173	295	201	747	3,315	1,531	30	3,592	613	45	3,184		632		3,842	12,082	14,511
Brunswick CC	1,361	186	183	447	2,122	1,102		2,225	296	1	1,391		253		777	5,541	7,443
Caldwell CC and TI	4,526	413	390	1,202	6,422	2,398		3,236	316	14	2,139	7	841		2,402	10,228	15,664
Cape Fear CC	9,259	883	821	1,409	12,041	3,501	2,831	7,759	422	10	1,714		1,333	52	2,910	19,339	27,803
Carteret CC	1,909	211	118	495	2,658	778		2,881	896		307		533	11	832	5,779	8,077
Catawba Valley CC	5,816	335	377	1,465	7,810	3,237		4,040	2,308	752	1,256	147	336	21	3,239	14,163	21,175
Central Carolina CC	4,067	804	691	1,633	7,025	4,409		6,537	571	10	771	73	566		1,236	13,427	19,801
Central Piedmont CC	23,734	777	1,292	4,452	29,712	11,402		11,582	6,060	26	684	69	1,166	2,320	161	31,700	59,335
Cleveland CC	3,320	728	239	1,896	6,016	848		3,425	124	6	1,192		304		1,049	6,710	12,144
Coastal Carolina CC	6,252	262	175	720	7,261	4,089		6,997	517		430		962		3,351	15,620	21,834
College of the Albemarle	2,670	237	137	734	3,710	2,314		3,162	290		95	28	1,141		356	7,186	10,534
Craven CC	4,031	237	116	805	5,101	1,369		4,758	330		4,532		306		763	11,706	16,431
Davidson County CC	4,117	465	355	999	5,797	2,965		5,930	834	38	807		189		701	10,930	16,099
Durham TCC	5,966	213	562	1,557	7,987	4,891		6,356	4,123	38	2,290	87	653	26	608	18,013	25,368
Edgecombe CC	3,474	459	47	661	4,577	1,956		2,324	169	35	1,270	7	423	74	183	5,753	10,066
Fayetteville TCC	11,850	682	259	3,045	15,509	5,910		10,093	6,365	19	1,529		1,205		2,304	25,300	38,971
Forsyth TCC	9,948	872	477	1,885	12,958	6,042		10,223	2,512	124	5,552		1,019		1,046	24,346	35,795
Gaston College	6,830	650	433	1,166	8,916	3,456		4,827	2,005	32	2,965	217	285		2,058	14,608	22,661
Glifford TCC	16,396	533	82	1,148	19,026	7,384		8,257	3,800		3,936	634	665		4,150	26,696	43,199
Haltax CC	1,635	236	342	249	2,421	1,295		2,756	419		970		600		114	5,745	7,834
Haywood CC	1,902	165	246	1,093	3,341	1,032		1,725	212		1,480		382		522	5,022	7,963
Isothermal CC	2,414	281	149	1,053	3,784	1,598		1,103	957		483		168		2,458	6,294	9,561
James Sprunt CC	974	407	134	599	2,049	638	197	2,475	154		815		1,346		2,370	7,379	8,999
Johnston CC	3,739	171	615	1,304	5,747	2,063		5,945	786	5	603	68	993	26	3,189	12,954	17,775
Lenoir CC	3,181	222	114	1,914	5,333	2,322		5,549	620	34	2,123		393	31	941	11,165	15,636
Martin CC	723	61	80	246	1,095	1,002		1,229	106		598	28	432	86	159	3,278	4,254
Mayland CC	987	87	382	950	2,374	1,303		2,364	20		521		295		435	4,594	6,489

College	Curriculum					Continuing Education												Total
	Assoo	Dipl	Cert	Trans	Curr Sub	Baso Skills	Learn Lab	Ooo RB	Ooo Ext 88	FIT	HRD	NIT/ET	SBC	Comm 8vo	Non Ooo 88	CE Sub		
McDowell TCC	1,162	378	230	395	2,093	715		3,239	660	16	1,078		61		579	5,908	7,637	
Mitchell CC	3,279	270	221	1,105	4,755	2,296		2,429	1,713	59	2,066		321		711	8,826	13,183	
Montgomery CC	823	120	122	409	1,443	545		2,339	264	53	395	13	306	24	122	3,766	4,984	
Nash CC	3,208	90	185	1,171	4,597	1,269		3,693	537		912	86	771		534	7,339	11,586	
Familco CC	369	33	134	225	752	340		796			128		76	34	62	1,279	1,943	
Piedmont CC	2,086	287	562	1,081	3,961	1,115		3,039	183	33	1,081		390	41	39	5,525	9,022	
Pitt CC	8,428	331	328	2,176	11,069	2,325		4,517	1,949	9	587		712	149	522	10,302	20,730	
Randolph CC	2,701	94	106	1,096	3,919	1,817		3,673	503		1,946	7	169		608	7,718	11,348	
Richmond CC	2,030	94	79	350	2,533	2,243		1,928	534		850		279		129	5,606	7,916	
Roanoke-Chowan CC	771	95	93	206	1,160	669		1,448	192		568		289			2,802	3,809	
Robeson CC	2,940	196	276	468	3,823	2,787		5,033	629		1,308	84	582		487	10,147	13,555	
Rockingham CC	1,931	290	771	500	3,360	1,337		2,626	697	30	842		222		1,513	6,788	9,619	
Rowan-Cabarrus CC	6,337	1,986	599	1,206	9,593	3,474		6,220	1,549	31	3,018	50	344		206	13,934	22,590	
Sampson CC	1,401	77	151	510	2,076	1,018		2,082	170	154	1,727		638		764	5,808	7,546	
Sandhills CC	4,302	269	233	1,321	5,964	1,470		3,398	873	35	283	81	581	263	1,294	7,662	12,966	
Southeastern CC	2,253	235	147	842	3,355	1,343		4,122	71		1,869		771		494	7,617	10,344	
South Piedmont CC	2,659	216	323	839	3,840	2,712		3,378	781	57	1,746	63	220		327	8,564	11,797	
Southwestern CC	2,336	80	200	1,118	3,668	1,536		3,070	846		980		69		55	5,611	9,005	
Stanly CC	2,982	241	570	987	4,667	1,809		2,882	183	20	477		395			5,385	9,592	
Surry CC	2,411	659	161	1,000	4,083	1,708		4,376	574	18	1,104		143		1,332	8,506	12,021	
Tri-County CC	1,186	193	13	608	1,980	395		1,149	258	23	194		175	12	595	2,614	4,351	
Vance-Granville CC	4,001	545	631	1,231	6,245	2,798		5,726	425	88	1,131	71	406	30	358	10,047	15,738	
Wake TCC	18,315	1,223	1,143	2,485	22,817	8,205	3,756	22,137	2,271	10	3,231		1,980	112	1,580	40,302	58,800	
Wayne CC	3,734	261	202	880	4,977	2,891	325	3,467	25	9	2,695		420	205	866	9,543	13,976	
Western Piedmont CC	3,577	121	186	563	4,337	2,569	20	3,875	867		1,682		306	31	1,319	9,654	13,404	
Wilkes CC	2,759	262	83	735	3,770	1,659		5,049	863		1,836		390		202	9,198	12,397	
Wilson CC	2,165	212	108	728	3,156	1,762		3,739	486	40	552	11	439		324	7,000	9,833	
System Total	244,374	20,900	17,691	63,057	334,879	139,338	7,156	229,686	55,520	2,287	79,622	2,349	30,461	3,568	61,871	560,434	847,165	

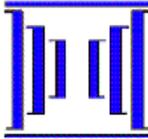
****Unduplicated headcounts are reported in each cell. Rows and columns will not add up.****

Source: Retrieved from url=

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APPENDIX B



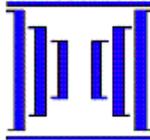
North Carolina Community College System
Curriculum Student Information II
Student Enrollment by Race and Gender by College
 (Unduplicated Headcount)

ANNTBL8 - II

Reporting Year: 2005-2006

Last Refresh on: 11/2/2006

	Am Ind Fem	Am Ind Male	Asian Fem	Asian Male	Black Fem	Black Male	Hisp Fem	Hisp Male	Other Fem	Other Male	White Fem	White Male	Grand Total
Alamance CC	27	7	62	35	1,089	338	114	73	281	134	2,487	1,561	6,208
Asheville-Buncombe TCC	32	19	31	31	297	183	79	75	164	112	4,230	3,202	8,455
Beaufort County CC	2	2	5	2	489	140	15	12	11	8	738	455	1,879
Bladen CC	229	15	6	2	702	201	14	6	23	11	581	197	1,987
Blue Ridge CC	2	4	9	9	121	46	73	29	21	17	1,478	928	2,737
Brunswick CC	8	4	5	2	205	47	18	7	19	9	682	292	1,298
Caldwell CC and TI	6	7	27	15	134	92	33	33	53	35	2,499	2,068	5,002
Cape Fear CC	38	32	34	31	932	496	99	85	134	119	3,948	3,596	9,544
Carteret CC	8	2	14	5	158	41	26	14	50	23	1,221	583	2,145
Catawba Valley CC	13	10	207	171	376	234	139	92	29	23	3,295	1,948	6,537
Central Carolina CC	29	12	35	20	1,127	533	176	132	67	34	2,517	1,621	6,303
Central Piedmont CC	63	46	641	546	5,008	2,419	774	531	380	295	7,430	6,267	24,400
Cleveland CC	4	4	15	15	777	268	30	20	35	22	2,028	1,219	4,437
Coastal Carolina CC	49	18	115	83	801	394	334	226	22	12	2,583	1,557	6,194
College of the Albemarle	15	8	11	10	544	169	32	17	24	25	1,319	647	2,821
Craven CC	20	9	39	37	706	284	95	110	65	43	1,841	1,258	4,507
Davidson County CC	10	7	40	24	425	131	38	33	20	21	2,112	1,082	3,943
Durham TCC	21	10	254	174	2,607	1,025	225	120	140	109	1,977	1,462	8,124



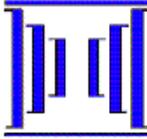
**North Carolina Community College System
Curriculum Student Information II
Student Enrollment by Race and Gender by College
(Unduplicated Headcount)**

ANNTBL8 - II

Reporting Year: 2005-2006

Last Refresh on: 11/2/2006

	Am Ind Fem	Am Ind Male	Asian Fem	Asian Male	Black Fem	Black Male	Hisp Fem	Hisp Male	Other Fem	Other Male	White Fem	White Male	Grand Total
Edgecombe CC	11	3	7	1	1,695	429	18	14	16	10	920	422	3,546
Fayetteville TCC	237	88	150	95	3,781	1,388	528	285	353	195	3,335	1,858	12,293
Forsyth TCC	40	22	93	45	1,830	765	182	121	161	94	4,026	2,477	9,856
Gaston College	21	10	43	31	896	259	107	71	86	53	3,593	1,970	7,140
Guilford TCC	37	27	190	161	3,044	1,598	157	155	162	91	3,813	3,377	12,812
Halifax CC	25	15	4	3	773	385	8	8	6	8	550	251	2,036
Haywood CC	13	11	9	4	54	11	7	11	15	10	1,538	1,146	2,829
Isothermal CC	6	8	7	4	349	134	31	24	21	14	1,520	935	3,053
James Sprunt CC	8	5	5	1	538	216	39	31	8	4	664	339	1,858
Johnston CC	15	20	16	18	744	545	154	112	57	48	2,838	1,617	6,184
Lenoir CC	3	6	10	2	1,116	394	26	17	37	23	1,324	775	3,733
Martin CC	3		2		581	145	2	2	23	10	357	154	1,279
Mayland CC	1	7	4	2	8	110	3	16	2	2	913	768	1,836
McDowell TCC	7	7	9	14	58	71	13	8	2	2	956	572	1,719
Mitchell CC	4	4	43	16	399	81	40	33	25	7	1,247	592	2,491
Montgomery CC	9	1	16	7	236	38	26	25	8	3	556	299	1,224
Nash CC	49	33	16	7	880	299	40	22	78	57	1,227	1,081	3,789
Pamlico CC	4	4			115	122	2	4	1	2	196	125	575
Piedmont CC	15	18	6	3	821	633	12	33	29	44	1,146	974	3,734



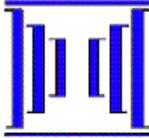
**North Carolina Community College System
Curriculum Student Information II
Student Enrollment by Race and Gender by College
(Unduplicated Headcount)**

ANNTBL8 - II

Reporting Year: 2005-2006

Last Refresh on: 11/2/2006

	Am Ind Fem	Am Ind Male	Asian Fem	Asian Male	Black Fem	Black Male	Hisp Fem	Hisp Male	Other Fem	Other Male	White Fem	White Male	Grand Total
Pitt CC	18	17	46	27	1,959	812	71	71	191	123	2,707	2,272	8,314
Randolph CC	7	5	19	24	206	71	67	50	12	10	1,792	822	3,085
Richmond CC	149	36	13	5	551	171	12	5		5	799	361	2,107
Roanoke Chowan CC	4	5	4	3	615	194	8		1	2	284	130	1,250
Robeson CC	887	206	7	11	613	206	17	13	9	6	455	182	2,612
Rockingham CC	7	2	16	3	413	125	19	18	16	13	1,334	726	2,692
Rowan-Cabarrus CC	22	9	73	28	1,150	371	107	67	34	23	3,414	1,792	7,090
Sampson CC	47	11	5		546	157	59	24	8	4	722	334	1,917
Sandhills CC	191	47	24	12	915	286	70	44	110	67	1,948	1,188	4,902
Southeastern CC	119	36	5	5	579	258	7	22	16	15	984	545	2,591
South Piedmont CC	16	15	8	10	680	285	37	34	20	15	1,049	600	2,769
Southwestern CC	159	66	8	7	22	20	25	11	43	34	1,453	802	2,650
Stanly CC	6	5	28	23	286	143	21	10	23	29	1,635	779	2,988
Surry CC	6	2	10	11	116	70	53	49	22	13	2,352	1,377	4,081
Tri-county CC	15	7	5		6	4	15	4	22	2	895	434	1,409
Vance-Granville CC	32	14	11	14	1,741	745	43	53	92	99	1,697	1,011	5,552
Wake TCC	58	43	509	391	2,880	1,521	450	314	411	364	5,454	5,070	17,465
Wayne CC	26	10	56	28	1,035	363	87	54	81	40	1,592	978	4,350
Western Piedmont CC	5	4	108	85	173	113	23	21	40	29	1,969	1,122	3,692



North Carolina Community College System
Curriculum Student Information II
Student Enrollment by Race and Gender by College
 (Unduplicated Headcount)

ANNTBL8 - II

Reporting Year: 2005-2006

Last Refresh on: 11/2/2006

	Am Ind Fem	Am Ind Male	Asian Fem	Asian Male	Black Fem	Black Male	Hisp Fem	Hisp Male	Other Fem	Other Male	White Fem	White Male	Grand Total
Wilkes CC	10	7	10	7	107	59	31	22	28	17	2,044	1,172	3,514
Wilson Technical CC	5	3	7	2	1,058	247	61	26	24	13	768	467	2,679
Total:	2,873	1,055	3,152	2,322	50,065	20,885	4,992	3,519	3,831	2,652	109,032	71,839	276,217

Source: Retrieved from url=
http://www.nccommunitycolleges.edu/Statistical_Reports/collegeYear2005-2006/annual/ann0405.htm

APPENDIX C

Study Variables

List of Variables in Cohorts

1. Ethnic code
2. Gender code
3. CIP code credential pursued
4. 2005 student age
5. Pell Grant Recipient
6. Program Change

Other Variable

1. CIP code credential earned

APPENDIX D

NCCCS Program Curriculum Program Titles—CIP Codes

Fall 2005 CIP Codes, CIP Area and Curriculum Name			
20053 CIP Code	2005 Fall CIP Area	2005 Fall Curriculum Code	Curriculum Name
240101	Arts and Science	A1010Q	SOCIAL WORK
240101	Arts and Science	A10100	ASSOCIATE IN ARTS
240101	Arts and Science	A1010M	SOCIAL SCIENCE SEC EDUC (PRE-MAJOR)
240101	Arts and Science	A1010R	ELEMENTARY EDUCATION
240101	Arts and Science	A10400	ASSOCIATE IN SCIENCE
240101	Arts and Science	A1010B	BUSINESS ADMINISTRATION (PRE-MAJOR)
240101	Arts and Science	A1010C	BUSINESS EDUC & MKTG EDUC (PRE-MAJOR)
240199	Arts and Science	A10300	ASSOCIATE IN GENERAL EDUCATION
240101	Arts and Science	A1010P	ELEMENTARY, MIDDLE GRADES AND SPECIAL ED
240101	Arts and Science	A1010N	SOCIOLOGY (PRE-MAJOR)
511105	Arts and Science	A1010I	NURSING (PRE-MAJOR)
240101	Arts and Science	A1010J	PHYSICAL EDUCATION (PRE-MAJOR)
240101	Arts and Science	A10200	ASSOCIATE IN FINE ARTS
140102	Arts and Science	A1040D	ENGINEERING (PRE-MAJOR)
240101	Arts and Science	A1020D	MUSIC AND MUSIC EDUCATION
240101	Arts and Science	A1010T	COMPUTER SCIENCE
240101	Arts and Science	A1040A	BIOLOGY AND BIOLOGY EDUC (PRE-MAJOR)
240101	Arts and Science	A1010L	PSYCHOLOGY (PRE-MAJOR)
240101	Arts and Science	A1010K	POLITICAL SCIENCE (PRE-MAJOR)
240101	Arts and Science	A1010D	CRIMINAL JUSTICE (PRE-MAJOR)
240101	Arts and Science	A1010S	SPECIAL EDUCATION
240101	Arts and Science	A1010O	SPEECH/COMMUNICATIONS (PRE-MAJOR)
240101	Arts and Science	A1010H	HISTORY (PRE-MAJOR)

240101	Arts and Science	A1040E	MATHEMATICS (PRE-MAJOR)
240101	Arts and Science	A1010E	ENGLISH (PRE-MAJOR)
240101	Arts and Science	A1010F	ENGLISH EDUCATION (PRE-MAJOR)
240101	Arts and Science	A1020C	DRAMA
240101	Arts and Science	A1040F	MATHEMATICS EDUCATION (PRE-MAJOR)
240101	Arts and Science	A1020A	ART
240101	Arts and Science	A1040C	COMPUTER SCIENCE (PRE-MAJOR)
240101	Arts and Science	A1040B	CHEMISTRY AND CHEMISTRY EDUC (PRE-MAJOR)
240101	Arts and Science	A1010A	ART EDUCATION (PRE-MAJOR)
240101	Arts and Science	A1010G	HEALTH EDUCATION (PRE-MAJOR)
521501	Business Technology	C25420	REAL ESTATE APPRAISAL
510705	Business Technology	A25310	MEDICAL OFFICE ADMINISTRATION
110103	Business Technology	A25260	INFORMATION SYSTEMS
110201	Business Technology	A25130	COMPUTER PROGRAMMING
510705	Business Technology	D25310	MEDICAL OFFICE ADMINISTRATION
520201	Business Technology	A25120	BUSINESS ADMINISTRATION
520204	Business Technology	A25360	OFFICE SYSTEMS TECHNOLOGY
520803	Business Technology	A2512A	BANKING AND FINANCE
521401	Business Technology	A2512F	MARKETING AND RETAILING
510705	Business Technology	C25310	MEDICAL OFFICE ADMINISTRATION
111002	Business Technology	A2526D	NETWORK ADMINISTRATION AND SUPPORT
111003	Business Technology	A25270	INFORMATION SYSTEMS SECURITY
220302	Business Technology	A25380	PARALEGAL TECHNOLOGY
510705	Business Technology	A25200	HEALTHCARE MANAGEMENT TECHNOLOGY
510708	Business	D25320	MEDICAL TRANSCRIPTION

	Technology		
520301	Business Technology	A25100	ACCOUNTING
520204	Business Technology	D25360	OFFICE SYSTEMS TECHNOLOGY
520909	Business Technology	A25240	HOTEL AND RESTAURANT MANAGEMENT
110103	Business Technology	D25260	INFORMATION SYSTEMS
110103	Business Technology	C25260	INFORMATION SYSTEMS
520208	Business Technology	A2512I	ELECTRONIC COMMERCE
520205	Business Technology	A2512G	OPERATIONS MANAGEMENT
521001	Business Technology	A2512C	HUMAN RESOURCES MANAGEMENT
520208	Business Technology	C2512I	ELECTRONIC COMMERCE
520201	Business Technology	C25120	BUSINESS ADMINISTRATION
520909	Business Technology	D25240	HOTEL AND RESTAURANT MANAGEMENT
110901	Business Technology	A25340	NETWORKING TECHNOLOGY
520204	Business Technology	C25360	OFFICE SYSTEMS TECHNOLOGY
520301	Business Technology	C25100	ACCOUNTING
220301	Business Technology	A2536A	LEGAL
521501	Business Technology	C25400	REAL ESTATE
220302	Business Technology	C25380	PARALEGAL TECHNOLOGY
520301	Business Technology	D25100	ACCOUNTING
520201	Business Technology	D25120	BUSINESS ADMINISTRATION
521501	Business Technology	D25400	REAL ESTATE
220302	Business Technology	D25380	PARALEGAL TECHNOLOGY
520205	Business Technology	A50260	INDUSTRIAL MANAGEMENT TECHNOLOGY
110201	Business	D25130	COMPUTER PROGRAMMING

	Technology		
111002	Business Technology	C2526D	NETWORK ADMINISTRATION AND SUPPORT
520404	Business Technology	A2536B	MEDICAL
520404	Business Technology	C2536B	MEDICAL
110201	Business Technology	C25130	COMPUTER PROGRAMMING
521001	Business Technology	D2512C	HUMAN RESOURCES MANAGEMENT
521001	Business Technology	C2512C	HUMAN RESOURCES MANAGEMENT
220303	Business Technology	A25140	COURT REPORTING AND CAPTIONING
510705	Business Technology	C25200	HEALTHCARE MANAGEMENT TECHNOLOGY
520205	Business Technology	C2512G	OPERATIONS MANAGEMENT
110901	Business Technology	C25340	NETWORKING TECHNOLOGY
440401	Business Technology	A2512H	PUBLIC ADMINISTRATION
520411	Business Technology	A2512B	CUSTOMER SERVICE TECHNOLOGY
521401	Business Technology	C2512F	MARKETING AND RETAILING
520203	Business Technology	C25170	GLOBAL LOGISTICS TECHNOLOGY
520909	Business Technology	C25240	HOTEL AND RESTAURANT MANAGEMENT
520203	Business Technology	A25170	GLOBAL LOGISTICS TECHNOLOGY
520203	Business Technology	C2512E	LOGISTICS MANAGEMENT
110802	Business Technology	A25150	DATABASE MANAGEMENT
521202	Business Technology	A2526E	PROGRAMMING
520208	Business Technology	D2512I	ELECTRONIC COMMERCE
100203	Business Technology	A25190	ENTERTAINMENT TECHNOLOGY
521905	Business Technology	D25440	TRAVEL AND TOURISM TECHNOLOGY
521202	Business	D2526E	PROGRAMMING

	Technology		
521101	Business Technology	A2512D	INTERNATIONAL BUSINESS
510705	Business Technology	D25200	HEALTHCARE MANAGEMENT TECHNOLOGY
520203	Business Technology	A2512E	LOGISTICS MANAGEMENT
111002	Business Technology	D2526D	NETWORK ADMINISTRATION AND SUPPORT
510708	Business Technology	C25320	MEDICAL TRANSCRIPTION
520204	Business Technology	A2536C	VIRTUAL OFFICE ASSISTANCE
110199	Business Technology	A25230	HIGH PERFORMANCE COMPUTING
510703	Business Technology	C25220	HEALTH UNIT COORDINATOR
520203	Business Technology	D25170	GLOBAL LOGISTICS TECHNOLOGY
110901	Business Technology	D25340	NETWORKING TECHNOLOGY
521401	Business Technology	D2512F	MARKETING AND RETAILING
521905	Business Technology	A25440	TRAVEL AND TOURISM TECHNOLOGY
220301	Business Technology	C2536A	LEGAL
520404	Business Technology	D2536B	MEDICAL
220301	Business Technology	D2536A	LEGAL
110199	Business Technology	C25230	HIGH PERFORMANCE COMPUTING
150805	Engineering Technology	A40320	MECHANICAL ENGINEERING TECHNOLOGY
150303	Engineering Technology	D40200	ELECTRONICS ENGINEERING TECHNOLOGY
151201	Engineering Technology	A40160	COMPUTER ENGINEERING TECHNOLOGY
150101	Engineering Technology	A40100	ARCHITECTURAL TECHNOLOGY
150303	Engineering Technology	A40200	ELECTRONICS ENGINEERING TECHNOLOGY
151201	Engineering Technology	C40160	COMPUTER ENGINEERING TECHNOLOGY
150201	Engineering	A40140	CIVIL ENGINEERING

	Technology		TECHNOLOGY
150303	Engineering Technology	C40200	ELECTRONICS ENGINEERING TECHNOLOGY
150303	Engineering Technology	A40180	ELECTRICAL ENGINEERING TECHNOLOGY
150303	Engineering Technology	A50140	ELECTRONICS TECHNOLOGY
151102	Engineering Technology	A40380	SURVEYING TECHNOLOGY
150101	Engineering Technology	C40100	ARCHITECTURAL TECHNOLOGY
150805	Engineering Technology	C40320	MECHANICAL ENGINEERING TECHNOLOGY
151302	Engineering Technology	A50150	CAD Technology
151306	Engineering Technology	A50340	MECHANICAL DRAFTING TECHNOLOGY
151306	Engineering Technology	C50340	MECHANICAL DRAFTING TECHNOLOGY
150305	Engineering Technology	A40400	TELECOMMUNICATIONS & NETWORK ENGRG TECH
470105	Engineering Technology	A40240	INDUSTRIAL ENGINEERING TECHNOLOGY
151201	Engineering Technology	D40160	COMPUTER ENGINEERING TECHNOLOGY
110301	Engineering Technology	C40220	GIS/GPS TECHNOLOGY
150304	Engineering Technology	A40280	LASER AND PHOTONICS TECHNOLOGY
470105	Engineering Technology	D40240	INDUSTRIAL ENGINEERING TECHNOLOGY
150805	Engineering Technology	C4032A	DRAFTING AND DESIGN
151306	Engineering Technology	D50340	MECHANICAL DRAFTING TECHNOLOGY
150201	Engineering Technology	C40140	CIVIL ENGINEERING TECHNOLOGY
150405	Engineering Technology	A40120	AUTOMATION/ROBOTICS TECHNOLOGY
150805	Engineering Technology	A4032A	DRAFTING AND DESIGN
150805	Engineering Technology	D40320	MECHANICAL ENGINEERING TECHNOLOGY
040601	Engineering Technology	A40260	LANDSCAPE ARCHITECTURE TECHNOLOGY
150404	Engineering	A4020A	INSTRUMENTATION

	Technology		
150303	Engineering Technology	C40180	ELECTRICAL ENGINEERING TECHNOLOGY
110301	Engineering Technology	A40220	GIS/GPS TECHNOLOGY
151102	Engineering Technology	C40380	SURVEYING TECHNOLOGY
470105	Engineering Technology	C40240	INDUSTRIAL ENGINEERING TECHNOLOGY
150101	Engineering Technology	D40100	ARCHITECTURAL TECHNOLOGY
150805	Engineering Technology	D4032A	DRAFTING AND DESIGN
510901	Health Technology	A45410	Interventional Cardiac and Vascular Technology
510917	Health Technology	C45650	POLYSOMNOGRAPHY
510999	Health Technology	C45200	CT & MRI TECHNOLOGY
600583	Health Technology	D45200	CT & MRI TECHNOLOGY
513801	Health Technology	A45100	ASSOCIATE DEGREE NURSING (INTEGRATED)
510801	Health Technology	A45400	MEDICAL ASSISTING
511599	Health Technology	A4538D	SOCIAL SERVICES
513902	Health Technology	C45480	NURSING ASSISTANT
510909	Health Technology	D45740	SURGICAL TECHNOLOGY
510801	Health Technology	D45400	MEDICAL ASSISTING
513901	Health Technology	D45660	PRACTICAL NURSING
511501	Health Technology	A4538E	SUBSTANCE ABUSE
511599	Health Technology	A45380	HUMAN SERVICES TECHNOLOGY
513501	Health Technology	D45750	THERAPEUTIC MASSAGE
513801	Health Technology	A45120	ASSOCIATE DEGREE NURSING(NON-INTEGRATED)
510909	Health Technology	A45740	SURGICAL TECHNOLOGY
510808	Health Technology	A45780	VETERINARY MEDICAL TECHNOLOGY
510601	Health Technology	D45240	DENTAL ASSISTING
510707	Health Technology	A45360	HEALTH INFORMATION TECHNOLOGY
511599	Health Technology	C45380	HUMAN SERVICES TECHNOLOGY
511004	Health Technology	A45420	MEDICAL LABORATORY TECHNOLOGY
510911	Health Technology	A45700	RADIOGRAPHY
510908	Health Technology	A45720	RESPIRATORY THERAPY
510801	Health Technology	C45400	MEDICAL ASSISTING
511599	Health Technology	A4538A	DEVELOPMENTAL DISABILITIES
510903	Health Technology	A45320	ELECTRONEURODIAGNOSTIC

			TECHNOLOGY
510905	Health Technology	A45460	NUCLEAR MEDICINE TECHNOLOGY
510805	Health Technology	D45580	PHARMACY TECHNOLOGY
510904	Health Technology	C45340	EMERGENCY MEDICAL SCIENCE
511599	Health Technology	A4538C	MENTAL HEALTH
510904	Health Technology	A45340	EMERGENCY MEDICAL SCIENCE
510816	Health Technology	A45730	SPEECH-LANGUAGE PATHOLOGY ASSISTANT
511011	Health Technology	D45300	DIALYSIS TECHNOLOGY
510602	<i>Health Technology</i>	<i>A45260</i>	<i>DENTAL HYGIENE</i>
510719	Health Technology	C45190	CLINICAL TRIALS RESEARCH ASSOCIATE
510803	Health Technology	A45500	OCCUPATIONAL THERAPY ASSISTANT
511599	Health Technology	C4538A	DEVELOPMENTAL DISABILITIES
511009	Health Technology	C45600	PHLEBOTOMY
511501	Health Technology	C4538E	SUBSTANCE ABUSE
510719	Health Technology	A45190	CLINICAL TRIALS RESEARCH ASSOCIATE
510707	Health Technology	D45360	HEALTH INFORMATION TECHNOLOGY
511599	Health Technology	D45380	HUMAN SERVICES TECHNOLOGY
511801	Health Technology	A45560	OPTICIANRY
510910	Health Technology	A45440	MEDICAL SONOGRAPHY
510999	Health Technology	C45140	CARDIOVASCULAR/VASCULAR INTERVENT. TECH.
510806	Health Technology	A45640	PHYSICAL THERAPIST ASSISTANT (1+1)
511802	Health Technology	C45520	OPTICAL APPRENTICE
510707	Health Technology	C45360	HEALTH INFORMATION TECHNOLOGY
512309	Health Technology	A45760	THERAPEUTIC RECREATION
513501	Health Technology	A45750	THERAPEUTIC MASSAGE
510999	Health Technology	C45160	CARDIOVASCULAR SONOGRAPHY
513104	Health Technology	C45310	DIETETIC TECHNICIAN
510603	Health Technology	A45280	DENTAL LABORATORY TECHNOLOGY
510806	Health Technology	A45620	PHYSICAL THERAPIST ASSISTANT (2-YEAR)
513104	Health Technology	A45310	DIETETIC TECHNICIAN
511599	Health Technology	D4538D	SOCIAL SERVICES
510905	Health Technology	D45460	NUCLEAR MEDICINE TECHNOLOGY

510901	Health Technology	A45170	CARDIOVASCULAR TECH. (INVASIVE & NON-INV
510910	Health Technology	D45440	MEDICAL SONOGRAPHY
519999	Health Technology	C45350	HEALTH CARE TECHNOLOGY
510907	Health Technology	A45680	RADIATION THERAPY TECHNOLOGY
510999	Health Technology	D45160	CARDIOVASCULAR SONOGRAPHY
510999	Health Technology	A45160	CARDIOVASCULAR SONOGRAPHY
510907	Health Technology	D45680	RADIATION THERAPY TECHNOLOGY
513901	Health Technology	C45390	LICENSED PRACTICAL NURSE REFRESHER
511599	Health Technology	C4538D	SOCIAL SERVICES
510904	Health Technology	D45340	EMERGENCY MEDICAL SCIENCE
510901	Health Technology	D45140	CARDIOVASCULAR/VASCULAR INTERVENT. TECH.
511002	Health Technology	C45220	CYTOTECHNOLOGY

Retrieved on September 9, 2011 from:
www.nccommunitycolleges.edu/.../Section07_20May2011_Curric_Prog_Titles.pdf

APPENDIX E



NORTH CAROLINA COMMUNITY COLLEGE SYSTEM
Dr. R. Scott Ralls, President

Letter of Agreement

October 18, 2011

To the Appalachian Institutional Review Board (IRB):

I am familiar with Van C. Wilson's research project entitled "Relationship of Program Area on Degree Attainment of African American Males Enrolled in Arts and Sciences, Business Technologies, Engineering Technologies, and Health Sciences program of Study in the North Carolina Community College System". I understand that the North Carolina Community College System's involvement to be to provide the researcher with student biographical and enrollment data from the NCCCS data warehouse.

As the research team conducts this research project I understand and agree that:

- This research will be carried out following sound ethical principles and that it has been approved by the IRB at Appalachian State University.
- Employee participation in this project is strictly voluntary and not a condition of employment at the North Carolina Community System Office. There are no contingencies for employees who choose to participate or decline to participate in this project. There will be no adverse employment consequences as a result of an employee's participation in this study.
- To the extent confidentiality may be protected under State or Federal law, the data collected will remain confidential, as described in the protocol. The name of our agency will be reported in the results of the study.

Therefore, as a representative of the North Carolina Community College System, I agree that Van C. Wilson's research project may be conducted using data from our agency, and that Van C. Wilson may assure participants that they may participate in providing data from the North Carolina Community College System's data warehouse and may also provide responsive information without adverse employment consequences.

Sincerely,

Bill Schneider
Associate Vice President
Research and Performance Management

MAILING ADDRESS: 5016 MAIL SERVICE CENTER ~ RALEIGH, NC 27699-5016
Street Address: 200 West Jones ~ Raleigh, NC 27603 ~ 919-807-7100 ~ Fax 919-807-7164
AN EQUAL OPPORTUNITY EMPLOYER

Biographical Sketch

Van Cedric Wilson was born in Newark, New Jersey on July 21, 1960. He attended elementary school in Summerset New Jersey and Zebulon, North Carolina, and graduated from Zebulon High School in 1978. He enrolled at Western Carolina University during that fall and in June of 1984 was awarded the Bachelor's degree in Chemistry. In fall of 1984 he accepted an administrative position at Western Carolina University. He began his course work towards his Master of Public Administration degree in 1989. The MPA degree was awarded during the spring of 1991. His Doctor of Education was awarded during the fall of 2012. Currently Van Cedric Wilson serves as the Associate Vice President of Student Learning and Success for the North Carolina Community College System.

Van Cedric Wilson is the son of Calvin Van and Helen Holder Wilson, and the father of Christin Victoria and Haleigh Lynette Wilson.