

A LOGISTIC REGRESSION STUDY OF HOW PRE-ENROLLMENT FACTORS PREDICT  
GRADUATION AT A CHRISTIAN HISTORICALLY BLACK UNIVERSITY

by

Tara Laron Young

Liberty University

A Dissertation Presented in Partial Fulfillment

Of the Requirements for the Degree

Doctor of Education

Liberty University

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## ABSTRACT

The purpose of this logistic regression study is to review the pre-admission factors through the lenses of multiple retention constructs and graduation rates at a Christian, Historically Black College or University (HBCU). A binary logistic regression is used to analyze the odds of graduation based on a set of pre-admission factors of first-time freshmen, as predictor variables. In particular, the predictor variables of interest are eligibility of academic support based on academic scholarships, gender, international status, and type of high school attended. The outcome variable of interest is graduation. This study is important because it contributes to the scholarship in the study of Christian HBCUs and the understanding of how preadmission factors may affect graduation. This study addresses the problem by using regression relationships to guide supportive programs that reinforce retention, persistence, and completion of students based on pre-admission factors, as reflected in the work of Tinto, Astin and other theorists. The number of participants used for this regression analysis supports adequate statistical power for a medium effect size. This study took place at a Christian HBCU in north Alabama with data collected from the admissions office for the freshmen class of 2011, where  $N=364$ . The results of this study suggest that students that attend a private high school have high odds of completing a post-secondary degree at a Christian HBCU and makes recommendations to support the retention and recruitment of the targeted population. The implications for further research could include a variety of replication studies with additional preadmission factors, longitudinal, mixed methods, or qualitative studies reviewing persistence, completion, and yearly graduation rates as they relate to the preadmission factors.

*Keywords:* higher education, graduation rates, HBCU, pre-admission factors

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### **Dedication**

This dissertation is dedicated to my God and my family. God is my ever-present help. Thank you, husband, Dr. Andrew Young, for quietly encouraging me during this process and reminding me that every step forward is a step toward the finish line. Thank you, Mckenzie for keeping me on track even when I was tired. Thank you, Mykah for reminding me that a break is a necessary part of the process. Thank you, Symmetris, for getting me into this mess in the first place. Thank you, Rondora for being curious and supportive from the beach. Thank you, Shelden for being my big brother. Thank you, Theodore and Lola Jefferson, for inspiring me to achieve more than your generation. Poppie, I wish you were here to witness this day. However, I trust that I will see you soon, RIP.

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### **List of Abbreviations**

Advanced Placement (AP)

American College Testing (ACT)

Cognitive Abilities Test (CogAT)

High School Grade Point Average (HSGPA)

Historically Black Colleges or Universities (HBCU)

Family Educational Rights and Privacy Act (FERPA)

General Education Diploma (GED)

Iowa Test of Basic Skills (ITBS)

Institutional Review Board (IRB)

National Assessment of Education Progress (NAEP)

Scholastic Aptitude Test (SAT)

Science Technology Engineering and Mathematics (STEM)

United States (U.S.)

## CHAPTER ONE: INTRODUCTION

### Overview

This chapter will delineate the urgent need of understanding how pre-admission factors may influence the graduation rates of students enrolled in a Historically Black College or University (HBCU) with an open admissions policy. Schools with open admission policies grant admission based on completion of high school or obtaining a General Education Diploma (GED). Obtaining a college degree holds relevance to an individual, institutions and society. However, notwithstanding these important factors, the past decades of political discourse in the United States indicates graduation rates as being relevant to the global society (Obama, 2008). The graduation rates hold pointed relevance to HBCU's because these schools graduate more black, low-income students than predominantly white institutions (Chiles, 2017). This chapter outlines the information that establishes the background, the problem statement, the purpose statement, the significance, the research question and definitions of this study.

### Background

Previously, black students who attended predominantly white institutions (PWIs) were tolerated based on the landmark decision of *Brown vs. The Board of Education* in 1954. This ruling gradually influenced the admission guidelines for PWIs to offer more affirmative action slots for admission to Black students. This new opportunity created more choice for Black students beyond that of HBCUs. As a result, the percentage of blacks attending HBCUs declined rapidly from 90% in the early 1960s to around 20% of blacks attending HBCUs by 1980s (Freeman & McDonald, 2004). While the PWIs have created more of a choice for Black students, their attendance does not come without inherent racial barriers. Many black students struggle with racial identity, stereotypes, and bias. These racial stressors, in addition to academic

and psychological challenges, may contribute to student's overall well-being and successful matriculation (Beasley, Chapman-Hilliard, & McClain, 2016). Black students are also returning to HBCUs because of the resurgence of racially charged incidences. As such, these students are seeking refuge from the racial incidences and a safe haven to flourish academically, socially, and mentally (Harris, 2018). Current data suggest 11% of all Black college students attend an HBCU, and these schools confer over 20% of bachelor's degrees received by Black students. More specifically, one-third of Blacks with a Ph.D. in science, technology, engineering, or mathematics (STEM) received their undergraduate degrees from HBCUs (Burrelli & Rappoport, 2008). For students who may have experienced academic struggles during their high school years, HBCUs may offer the opportunity of acceptance. For many PWIs, the incoming freshman has a higher required GPA and standardized test score than most HBCUs. HBCUs are an incubator for students majoring in the STEM fields. More than 60% of black physicians and 50% of black engineers graduate from HBCUs According to a 2012 HBCU Career Center Survey, over 90% of HBCUs offer job placement services for graduates as well as for the alumni (Lynch, 2014). These statistics underscore the current relevance of the sustainability of HBCUs.

Collectively, the 100 colleges and universities that are classified as HBCUs bear the tremendous privilege of educating over 20% of African Americans earning a college degree (Provasnik & Shafer, 2004). According to Pratt stated an increasing number of minority students are returning to HBCUs because of the current cultural climate and police brutality (2016). Gallup data found nearly half of the black students that attended an HBCU stated it was the perfect choice for them because they felt supported and ready for the workforce (2015). For those Black students attending PWIs the percentage decreases. Twenty-five percent of blacks attended predominantly white institutions reported feelings of support and readiness to enter the

workforce (New, 2015). This data pointedly attests to the relevance of minority-serving schools and the responsibility of educating a generation that will have an indelible effect on life, liberty, and the pursuit of happiness. Further, information from the 2012 Census showed minority birthrates outpacing those of European descent for the first time in United States history (Dougherty & Jordan, 2012). This increase in minority birthrates underscores the importance of educating this growing population. An overview of historical, social, and theoretical contexts as they relate to the study as well as a brief synopsis of the establishment of HBCUs and their importance for African American students will follow.

### **Historical Context**

State and federal mandates are requiring a more transparent approach to student outcomes, including graduation, retention, and job placement rates (Spellings, 2006). The Obama Administration proposed The American Graduation Initiative to establish targets to improve graduation outcomes to access federal funds. In 2008, the Higher Education Opportunity Act suggested consumers should have access to institutional graduation rates. Compared with the graduation rates of selective admission schools, which is approximately 56 percent, schools that have a liberal or open admission policy struggle to have graduation rates above 40 percent. Broad support from 22 states has spurred the commitment to increase undergraduate completers in United States (American Council on Education, 2010; Bauer-Wolf, 2017). Open admission schools welcome nearly 90% of the nation's eligible first-time freshman (Sullivan, 2008). Strategies to retain freshmen become increasingly challenging when 60% of the students are not academically prepared for college-level work (SREB, 2010). An educational initiative of the Obama Administration was to have the United States ranked first in college graduates per capita. For the United States to lead the world in college graduates would mean a 50% increase in our

current graduation rates (The White House, 2011). The need to obtain a college degree for society is increasingly vital. The economy of the United States has changed into one based more on knowledge, critical skills, and expertise acquired while receiving a postsecondary education (McGuire, 2011). Ninety-seven percent of over 600 government officials, leaders, and business executives affirmed higher education as vital to the well-being of society, ensuring a space around the table of medical advances, technological queries, as well as foreign and domestic perpetuations (Detorres, 2012).

### **Economic Context**

Graduation is important for economic vitality and a critical component of an institution's existence (Jobe & Lenio, 2014). The federal government would benefit from a better return on the investment of billions of dollars spent on students that attend college for a trivial amount of time, before dropping out (Adam, 2012). Significant financial resources come from a marginal increase in retention for any institution. An increase in retention can have a compounding effect on the economic growth and stability of an organization (Ackerman & Schibrowsky, 2007). When principles of business were included in an equation of a school that enrolled 2000 students that reported a 31.5%, the projection was remarkable. The numbers projected to increase retention was to retain just one extra student per 10; the graduation rate would increase exponentially. The result would be an increase in hundreds of students educated, an increase in financial capital and an improvement in graduation rate by 65% (Ackerman & Schibrowsky, 2007).

To stay viable and relevant as a university or college, examining retention is essential for the survival and significance of institutions of higher learning. Moreover, it was only about 70 years ago that retention research started in higher education (Braxton, 2000). In 1975, Astin and

Tinto published foundational research studies in retention. Astin highlighted student characteristics (gender, age, and residency) and their affects on retention (1975). While, Tinto's study focused on the institutional variables (type, location, etc.,) that affect retention (1975). Since these studies, there has been a noticeable demographic change in the arena of higher education (Keller, 2001). Several researchers have emphasized the need to address the retention needs for those of color (Padilla, Trevino, Gonzalez, & Trevino, 1997; Ulloa & Herrera, 2006).

### **Social Context**

For most, economic prosperity and social progress is not an inherited position. However, research has found earning a college degree has a prominent influence in making these a reality (Carnevale, Rose, & Cheah, 2011). One might find that working in a high tech, highly specialized industry requiring a college degree is not their ultimate goal. The entry requirement for most low skill jobs is now a college degree, rather than a high school diploma. However, a bachelor's degree has become the entry level credential for low skill jobs rather than a high school diploma for the same scope of work (Rampell, 2012). Low skill jobs are outpacing careers that require college degrees and pursuing a college degree may be mandatory to contribute to society adequately. Over 75% of the emerging jobs of the decade are low skill type jobs (Vedder, Denhart, & Robe, 2013). In addition to job security, those who earn a college degree enjoy higher earnings, civic responsibility, and an increased level of health and well-being (Baum, Ma, & Payea, 2013).

Freidman speaks of a society leveled by the many technological advances of today's world (2006). This phenomenon creates an atmosphere of the interdependence of societies, nations, and industries. Our educational system is the key to competing in this flat world. Our society's survival depends on educating future generations to keep the education pipeline filled

with qualified candidates. The education of personnel that can function optimally in the atmosphere of the flattening of the world is a mission of institutions of postsecondary education. Obama (2008) stated, “Now is the time to finally meet our moral obligation to provide every child a world-class education because it will take nothing less to compete in the global economy” (p. 3).

### **Theoretical Context**

Tracking retention in higher education can be traced in the work of Braxton (2000), which builds on the research Tinto (1975) and Astin (1975). Astin’s retention research focused on the subcategories of institutional factors (type, and admission practices) vs. student factors (age, gender, and citizenship). Tinto’s (1975) Theory of Student Departure is a theoretical foundation of retention. The theory starts with pre-entry attributes of incoming students and ends with successful departure. These pre-entry factors will inform the intentions, goals, and commitments of students. The institution can use this input to sustain programs that work and to create curriculums that are needed to support the relevant needs of all students (Astin, 1975; Pascarella & Terenzim, 1983; Tinto, 2012). Foundational to Tinto’s theory is a student’s commitment to obtaining a degree and connection to the institution as direct measures to retention.

During the 1970’s, the student demographics in higher education were homogeneous and reflected the population of that time. In particular, the majority of college students during this time were White, 18-22 year- olds full-time residential students. Many of the seminal works in the area of retention predate the changing landscape of students in higher education as it relates to gender, age, and race. Around the 1980’s, the population of women enrolled in institutions of higher education outpaced that of men for the first time (National Center for Education Statistics,

2001) and this trend continues (Woodard, Love, & Komives, 2000). In the last three decades since the 1970's, the number of older students returning to college has increased by 144 percent, while the percentage of traditional college attendees has remained relatively steady (Anderson, 2003). Much of the dynamic shift in the varied demographics in higher education took place as a result of the influx of racial and ethnic minorities. The history of the struggle for racial equality for Blacks in society is mirrored in this change and took place during the last quarter of a century (Pascarelli and Terenzii, 1998). During a ten-year period of 1984 to 1994, the population of Blacks entering colleges or universities increased to 61% while that of Whites was a mere 5% (National Center for Education Statistics, 2001).

### **Historically Black Colleges and Universities (HBCUs)**

During and immediately after the Civil War where Blacks fought for freedom, rights, and recognition as full citizens of the United States, having free access to attend colleges and universities was a limited dream for many Blacks. Before this time, three universities offered education to the Black population, Lincoln, Cheney, and Wilberforce Universities (Gasman & Tudico, 2008). However, after the Civil War more institutions started to educate the now free Black man. It is noted that in 1861 nearly 90% of blacks were illiterate, making it necessary to educate Blacks in basic skills (Mbajekwe, 2006). Many churches took on the task and became grassroots movements birthing institutions like Dillard University, Talladega College and Tougaloo College (Redd, 1998). The primary focus of these post secondary schools was to teach essential reading and writing skills these students historically lacked. The education offered to Blacks helped give more opportunities for them to contribute to society and support one's family. The education was also a way to promote equality in the past era of legalized discrimination and oppression (Albritton, 2012).



The Higher Education Act of 1965 defined specified institutions established before 1864 whose primary focus was to educate the Black population in post secondary schools now known as HBCUs. Gasmen (2009) explores the relevancy of HBCUs' that continue to have a prominent legacy of educating minorities. Often times these institutions offer opportunities to academically deficient students that enhance the probabilities for these students to complete the requirements to earn a college degree.

### **Problem Statement**

Currently, college graduation rates for African Americans nationwide is more than 20 percentage points lower than the rate for whites and 10% lower than Hispanics (The Education Trust, 2016). The national graduation rate for African American students stands at 42% (Cross & Slater, 2001). Many African American students enter college academically underprepared as is indicated by scores on college placement exams (Jackson & Kurlaender, 2014). Students who score below the college standard in core subjects like reading, math, and writing may have academic difficulty with college level coursework (Hughes, Gibbons, & Mynatt, 2013). Even though the graduation rate is reported as 83% by the National Assessment of Education Progress report, only 37 percent of these graduates meet the college readiness standards and almost 70 percent of these graduates would attend college after high school (Pratt, 2017). One in three first-time college students have academic deficits that require remediation (Byrd & MacDonald, 2005). These underprepared students are more likely to leave college without a degree as compared to their academically prepared peers (Radford, Berkner, Wheelless, & Shepard, 2010). In addition to academic under preparedness, many students enter college with pre-admission and non-cognitive factors impeding their college success. Pre-admission factors may influence college completion by as much as two-thirds (Astin & Oseguera, 2005). These factors may

include student's background, individual traits and academic history, which impact a students' ability to continue in college (Tinto, 2012). According to Sedlecek and Brooks (1976), non-cognitive variables can be used as a predictive tool to determine college success for minority and non-traditional students. Learning analytics applied to these non-cognitive variables can support retention efforts (Sedlacek & Brooks, 1976).

HBCUs are prominent contributors to closing the educational gap of African American minorities with their white counterparts. Approximately 20% of African Americans attaining a college degree, graduate from an HBCU. It is noted that in the science, technology, engineering, and math (STEM) areas, a college degree is mandatory; HBCUs significantly contribute to educating minority students in these areas (Allen & Jewell, 2002). However, there is a decline in college graduation rates at many HBCUs. While there are research studies about HBCUs as it relates to low graduation rates, there remains a dearth of research that focuses on retention and strategies for increasing graduation (Fryer & Greenstone, 2007; Kim & Conrad, 2006). Additional research is imperative, as the discussion of performance based funding is quickly becoming a reality. As such, the lower performing colleges and universities may find a lack of federal and state funding to support their institutions. This study will address the problem by using the predictive relationships found to guide supportive programs that reinforce retention, persistence, and completion of students based on pre-admission factors. The problem is the need for HBCUs to increase graduation rates for the viability of the society, institutions and students.

### **Purpose Statement**

The purpose of this predictive correlation study was to determine if there is a predictive statistical relationship, existing between pre-enrollment variables of the first-time freshman at an

HBCU and graduation rates. The use of historical data will be used from the freshman class of 2011 and the graduation data from 2015-2017 from the same class will be evaluated. Eligibility for academic support based on standardized test composite scores and high school grade point average (HSGPA), gender (male and female), international status (students required to participate in the federal government's Student and Exchange Visitor Information Database), and type of high school (public and private) attended were the predictor variables in this study. A public high school can be identified as a high school receiving federal and state funds. A private high school is one that does not receive federal and state funds. The criterion variable is graduation by 2017, as this date encompasses the target of completion within the 150% timeframe (NCES, 2011). The population for this study came from a Christian HBCU located in north Alabama with an average yearly enrollment of 1800.

### **Significance of the Study**

Studying the preadmission factors would better inform colleges and universities to enhance the use of their resources, support, and curriculum undergirding retention initiatives that lead to graduation. There have been preliminary studies seeking to predict graduation rates from pre-admission variables. These studies are substantive yet, minuscule start to the body of knowledge (Gasman & Commodore, 2014). Studies published on how preadmission factors can predict graduation outcomes at HBCUs are limited. Currently, the national graduation rate for African American students stands at 42%, which undergirds the prominence of this issue (Cross & Slater, 2001). Furthermore, the graduation rate for 83 HBCUs reports graduation rates of 37% (Stripling, 2010). The need to start exploring this population is reinforced by Talbert (2012) who found the completion rates among students of color mandates attention. More recently, a study conducted by the California State University (CSU) asserts there is a great need to study factors

facilitating degree completion for all students (Jackson & Kurlaender, 2014). Closely examining pre-admission factors were shown to shed light on interventions and supports for students during the first year of attendance to strengthen success (Sperry, 2015). Students voluntarily enroll and attend postsecondary institutions; however, once the students arrive on campus, the institution should provide the needed support propelling the student to completion (Talbert, 2012). This study will contribute to the scholarship in this area by exploring how preadmission factors reflect the work of Tinto, Astin, and other theorists as they relate to Christian HBCUs in the area of graduation and attrition.

### **Research Question**

**RQ1:** Can college graduation be predicted from a combination of pre-admission factors of gender, type of HS attended, international status, and eligibility of scholarship support based on HSGPA and standardized test scores for first-time freshmen?

### **Definitions**

1. *Attrition* - decrease in the number of students enrolled in an institution (Martinez, 2003). For this study, attrition is defined through the students that did not complete by time and a half, 150%.
2. *Black or African Americans* – In this study, the term Black and African American will be used interchangeably to refer to an American of black African descent (Berlin, 2010).
3. *Graduation rate* – The defined time and a half of 150% to complete a bachelor's degree, which is six years from entering a baccalaureate college or university as a first-time freshman (Cook & Hartle, 2011; NCES, 2014).
4. *Historically Black College or University (HBCU)* – A postsecondary institution that

- was established before 1964 primarily to educate African American students (Higher Education Act, 1965).
5. *International Students* – Students required to participate in the federal government’s Student and Exchange Visitor Information Database based on citizenship (Association of International Educators, 2016).
  6. *Liberal or open admitting institution* – An institution that accepts most students, despite test scores or other factors, who have filled out an application, have a completed high school, or earned a GED (Luna-Torres, Barnes, Cejda, Mingo, & Sheridan, 2009).
  7. *Pre-admission factors* – Student’s background characteristics that have been established during the application process such as test scores, gender, HSGPA, etc., (Tinto, 2012).

## **CHAPTER TWO: LITERATURE REVIEW**

### **Overview**

The literature review will identify the benefits of earning a college education for African American students. An increase in retention would offer more financial stability for families and institutions. With a discussion of relevant literature and the theoretical framework, the importance that higher education supports critical skills, thinking, and careers is highlighted. Additionally, the literature review will discuss the predictive correlative relationship between the pre-enrollment variables of the first-time freshman at an HBCU and graduation rates.

### **Importance of Graduation Rates for African American Students**

A bachelor's degree has become the entry-level criteria for low skill jobs rather than a high school diploma for the same scope of work (Rampell, 2012). Minor (2004) found that a college degree has become the point of entry for many into making a living. Those who earn a college degree enjoy higher earnings, civic responsibility, and an increased level of health and wellbeing (Baum, Ma, & Payea, 2013). Earning a college degree increases the earning potential of a person twice as much as a person with only a high-school diploma throughout their lifetime (US Department of Education, 2006). A study conducted by California State University (CSU) asserts there is a great need to study factors facilitating degree completion (Jackson & Kurlaender, 2014). When students obtain a college degree, the unemployment rate decreases at least by half. Moreover, people earning a bachelors degree tend to have increased health, retirement benefits, and access to healthcare (Baum, Ma, & Payea, 2013). Families headed by those having earned a college degree are found to make 1.6 million dollars more than those with high-school diplomas (Hansen, 2003). A college degree is necessary for many jobs in today's society.

The Obama Administration set a 2020 goal that, all adults would have committed to at least one year of postsecondary school or career training subsequently propelling the United States as having the highest proportion of college graduates in the world. Resources must be heavily invested in the underserved, fastest growing populations in the United States. Asian Americans, African Americans, and Hispanics have the lowest college graduation rates. Projections suggest the population of people of color will increase from 31% to 40% by 2020 and 52% by 2050 (Harmon, 2012). Harmon (2012) recognizes a central component of reaching this goal is the vital role and investment in minority-serving institutions.

Postsecondary schools are doing decent work recruiting students that desire a traditional degree in education. Often times a degree is essential to forming the platform for other highly competitive, skilled and necessary responsibilities, making the issue of retaining students a vital mission of colleges and universities. However, one in three first time freshmen in postsecondary students will not return to school for the sophomore year. Furthermore, according to the research, only 59% of these students graduate within six years of their freshman year (NCES, 2017).

Many students that do not graduate are encumbered with student loan debt without having obtained the education necessary to start a lucrative career (Olson, 2012). The graduation rates for African American students lags considerably behind that of their White and Hispanic counterparts (JBHE, 2006). Talbert (2012) found the completion rates among students of color mandate focused attention. In a recent, study the graduation rates for African Americans nationwide is more than 20 percentage points lower than the rate for whites and 10% lower than Hispanics (The Education Trust, 2016).

The graduation rates for all students could increase. It is imperative to support and address this need in open admission institutions because these institutions educate the majority of

America. A comprehensive approach to increasing the graduation rates is crucial. The strength of America's families and the economic strength of the country depend on the success of higher education. The combination of skills and education will determine the trajectory of individuals, families, communities, and this country. Further evidence suggests being college educated determines financial viability of a person. By 2020, it is estimated that two-thirds of jobs will require a post-secondary degree (U.S Department of Education, 2015). The graduation rates of African American students in some selective admission institutions are higher than that of other ethnicities in the same schools (Anonymous, 2010). It could be that to increase the probability of graduation of African American students is to work on being among the selected student populations attending such institutions. It is important to note, however, these schools have a limited number of seats enrolling up to a mere 10% of students of Black students (McGill, 2015). It is therefore incumbent to invest resources in open admission institutions to facilitate the education of the masses needed to fill the educational void.

The burden of educating the majority of the next generation of skilled, trained and competent workforce lies squarely on the shoulders of open admission institutions, where 90% of students earning degrees enroll (The National Center for Public Policy and Higher Education, 2010). An investment in the schools with liberal admission standards provides access to higher education despite a student's academic or socioeconomic status. Additionally, these schools have the privilege to educate the majority of the students enrolling in postsecondary institutions.

Many students enrolling into postsecondary institutions understand the prominence that earning a college degree would have in shaping their future. However, the hope of a degree does not negate the challenges that seem to permeate many students who attend open admission institutions. Many students are enrolling academically under prepared and in need of



developmental preparation to rise to the standard of being able to complete college work. To increase the graduation rates of African American students is multifaceted. Schools must invest in the expert personnel, resources and developmental programs to lay the foundation for these students to succeed. Additionally, students are laden with an overabundance of challenges (going to school, working fulltime, caring for children, competing schedules, lack of resources, lack of understanding the process) that easily distract from studying (Greer & Chwalisz, 2007). A thorough review of the literature reveals several approaches that could positively impact the graduation rate of African American students, which include funding, and institutional retention programs.

### **Funding**

Schools cannot increase retention rates without assistance. Federal and state legislators have the platform to craft an educational agenda, which would include higher education curriculum and initiatives that would promote retention and support the values of this society. The future of innovation and progress in the United States lies on the shoulders of this generation. Extensive research conducted by New America finds that change must occur from preschool through higher education and continue in workforce development. Specifically, New America promotes ten educational practices. Most underscore the importance of collaboration between the Federal government and institutions of higher learning to exact change (New America, 2017). Currently, there is inconsistency in the perceived needs of society and educational agenda of the state and federal government. The inconsistency is evident in the gap in private funding and federal support (Jones, 2016). Government financial support undergirds the agenda set by the legislators. Furthermore, the focus of education would help secure the foundation of K-12 schools to increase preparation for college-level classes, to increase the

anticipation of attending college and to increase the funds available to afford college. Therefore, the agenda must be educationally forward. An increase in funds from the government could directly support scholarships for students and indirectly support the growth of retention programs (Jones, 2016).

Many families understand the need to promote education and send their children to universities to have an opportunity at a better life. These students start their postsecondary life at open or liberal admitting institutions. To finance school, almost 80% of HBCU graduates leave school with student loan debt (New America, 2015). However, 69% of African American students leave college because of the high cost (Cross and Slater, 2001). Because of the high cost, thousands of students have started the process and only have debt, but no degree. Moreover, students do not have the means to close the gap that exist between financial aid and cost of college (Pugh & Thompson, 2010). The cost of college for many, represent the second largest investment after the purchase of a house. Scholarships and grants are essential to support the educational desires of students (Cross and Slater, 2001; The JBHE Foundation, 2010). African-American students are recipients of over 25% of Pell grant. Moreover, more than 70% of students that attend HBCUs qualify for these federal grants (Carswell, 2017). This accounts for over 4 billion dollars annually (JBHE, 2016).

Automatic scholarships are one type of staple award sponsored by an institution but can be expanded through private funding. Automatic scholarships are the initial awards students are exposed to from a school's recruitment material and eligibility is normally based on standardized test scores and high school grade point average. These types of scholarships help students understand the criteria and level of award based on their individual credentials. Automatic scholarships are publicized on an institution's website, pamphlets and marketing paraphernalia

for all interested to have access to the information. Additionally, the criteria for retaining and renewal of the scholarship are publicized. Eligibility of automatic scholarships are initially based on test scores and HSGPA, however, keeping the award is based on maintaining a certain GPA and making sufficient progress during enrollment (Pugh & Thompson, 2010).

With the increasing cost of postsecondary education and the decrease in state and federal aid, institutions must supplement the financial needs of students. Dialogue on the need for merit-based aid is one that is ongoing. Additionally, some believe schools should invest more resources to close the funding gap if middle- and low-income students (Pugh & Thompson, 2010). Many students apply to multiple schools to determine which one is most affordable based on reduced tuition because of scholarship awards. Therefore, the administration should focus on implementing strategies to increase private funding like endowments and other sources of income, etc., (Albritton, 2012). These revenue sources support scholarships given to students who are making satisfactory academic progress in need of funds to continue. Further, investing in industries that provide students with capital to matriculate while building valuable career skills and partnerships could be a lifeline to degree completion.

### **Institutional Retention Programs**

Retention programs are important. However, each program is just a piece of the puzzle. Every puzzle piece is vital to complete the retention picture and degree completion. Successful campus integration can only take place when all the entities of campus life work together, the administrators, faculty, staff, student leaders, and the community and are integral in the process of ushering students toward degree completion (Rosario, Flemister, Gampert, Grindlye, 2013). The Department of Education publishes a RSS Feed made available for colleges and universities

to share and research promising practices and retention initiatives to increase graduation rates. Some of these retention programs are parsed out later in this text.

### **Theoretical Framework**

According to Butler (2011), students have many reasons for the lack of persistence in college including circumstances, preferences, preparedness, adjustment, offerings, and experience. The institution may intervene using several theoretical approaches/models on student retention (Kerby, 2015). The student retention philosophy has grown from many researchers resulting in several viable theories. The following section will outline many of the seminal research studies and retention theories.

**Spady.** One of the first notable works on student retention was introduced by Spady (1971) detailing a student dropout model that included academic and social factors of students. Spady asserted five educational factors determine student persistence to include academic potential, normative congruence, grade performance, intellectual development and friendship support. Normative congruence generally refers to the compatibility of a student based on dispositions, expectations and demands as a result of interaction in the campus environment (Spady, 1971). Because of these factors, many institutions reviewed and amended policies that seemed prohibitive to student academic success.

**Tinto.** In research spanning decades, Tinto's model on student retention and departure is one of the seminal works of student retention theory. Tinto's work was built on the work of Spady (1971). Tinto suggests students enter college with the commitment to stay in college but as academic and social integration bear an influence the student, so does the decision to stay in school or leave school fluctuates. As Tinto further developed the theory, outside commitments and intentions of the students also become a factor. In 1993, Tinto added another level of

student departure. If the student failed to negotiate the rite of passage (a student's failure to distance themselves from high school friends and family, adopting the values of faculty, staff and students of the college enrolled), he/she would more than likely not return to school. Student persistence and retention are of utmost importance in higher education.

Accordingly, the two systems critical in the decision to persist in a college or university are connected to the school's ability to corral the academic and social policies of the institution to aptly encapsulate a student's needs and desires (Tinto, 2012). The academic needs contribute to matriculation towards graduation: classes, faculty, and advising. The social needs of students are less tangible but vitally essential to the success of students. In Tinto's model, the retention of students is directly related to an institutions ability to mitigate the needs of each student. Although students vary in characteristics, Tinto believes it is the academic and social investment after admission that influences persistence (Tinto,1993). Tinto's model continues to guide retention programs in higher education.

Tinto's theory hypothesizes that a student's preadmission characteristics (gender, race, socioeconomic status, academic aptitude, etc.) directly impact the decision and the statistics of student retention (Elkins, Braxton, & James, 2000). At the crux of Tinto's theory is three phases of student retention. First, the Stage of Separation when students must permanently or temporarily leave behind family, friends, and support systems in exchange for different support systems in college. Second, the Stage of Transition is a time before a student feels fully integrated into their new school environment while distancing is occurring between the students' old network of support, friends, and resources. Third, Incorporation Stage marks the time when a student is fully integrated into the fabric of an institutions culture, academic and social

interactions (Tinto,1987). Moving a student through the three phases toward full integration impacts retention (Tinto, 1987).

**Astin.** Astin's (1999) Theory of Involvement posits student learning is closely related to academic and social interactions within a campus community. This theory seems to parallel the work of Tinto. The belief is that a student who is immersed in the culture of an institution spends a considerable amount of time interacting with faculty, participating in co-curricular activities, and pursuing academic interests. More student involvement tends to translate into higher retention; however, for some student populations, the correlation is weaker (Roberts & Stryron, 2010). For Astin (1999), student involvement can be defined as the student who spends most of his/her time on campus involved with campus activities both academic and in student organizations building professional relationships with faculty. These elements lay the foundation for a student's network in collegiate life and positively influence retention (Pascarella & Terenzini, 1991). Astin stresses institutions should review how academic and social activities facilitate student satisfaction (1999).

**Bean and Eaton.** Bean and Eaton posit successful retention programs are grounded in four psychological theories: attitude-behavior theory (source), coping behavioral theory (French, Rodgers, & Cobb, 1974), self-efficacy theory (Bandura, 1997) and attrition theory (Rotter, 1966; Weiner, 1986). Understanding the aspects of these theories may aid schools in grasping how their chosen retention model increases the success of a student. Bean and Eaton further assert a students' academic and social integration are outcomes of the psychological theories. As such, schools who review these factors while using the factors to strengthen their retention programming may be more successful in their retention efforts. More specifically, if institutions foster the use of service-learning programs, learning communities, freshman orientation

seminars, and mentoring programs, and other programs that engage students both socially and academically, then an increase of student retention should follow (Bean & Eaton, 2002). The use of a psychological model tracks students as they successfully navigate new situations and phenomena. These experiences strengthen the students' self-efficacy and integration in a new system reinforcing the connection and increasing student retention (Bean & Eaton, 2002). While Spady (1971), Tinto (1987, 1993, 2012) Bean and Eaton (2002) added to the discourse in retention models for higher education, Berry (1985) founder of relationship marketing has a model that may be used by institutions to aid in retention.

**Berry.** Relationship marketing defined as admitting, sustaining and augmenting existing relationship could serve as a model of retention (Berry, 1983). The idea undergirding relationship marketing is that it is more profitable to nurture existing relationships with students and customers than to corral recruits. Institutions would do well to be intentional about keeping the students already enrolled (Boylan, 2009). Institutions could make gain when relationship marketing principles are practiced with fidelity.

The retention challenge in higher education could be improved when the effective principles of relationship marketing are applied strategically upon a student's initial enrollment. When an institutions administration, faculty, and staff adopt strategies to nurture the relationship of students effectively, it could be a significant boost to retention efforts for colleges and universities. According to Berry (1983), relationship marketing is most applicable when three primary conditions exist. First, a continual need for the service is explicit. Institutions of higher education provide a frequent educational need to students culminating with degree completion. Secondly, the principles of relationship marketing may have optimal success when the customer freely chooses the service rendered. Students unequivocally decide to attend a particular college

or university. Third, when alternatives exist that could meet the customers' needs; relationship-marketing strategies may be applicable. Student retention in higher education may be a suitable situation to apply principles of relationship marketing (Ackerman & Schibrowsky, 2007).

### **Theoretical Framework and Current Study**

Retention theory can be traced in the work of Spady (1971), Braxton (2000) and Astin's (1975). Spady's retention theory suggests both academic and social factors affect the retention and success of students matriculating in college. Astin's retention focused on the subcategories of institutional factors (type, and admission practices) vs. student factors (age, gender, and citizenship). Tinto's (1975) theory starts with pre-entry attributes of incoming students and ends with successful departure. These pre-entry factors will inform the intentions, goals, and commitments of students. The retention research of Bean and Eaton (2002) further expand these retention theories. Berry (1983) develops relationship marketing, traditionally used as a business model, suggestion institutions be intentional about sustaining and augmenting existing student relationships as a mechanism to support retention. In this current study, the institution can utilize retention research to sustain effective programs and to create curriculums needed to support the relevant needs of all students (Astin, 1975; Pascarella & Terenzim, 1983; Tinto, 2012). The preadmission factors in this study—a student's eligibility of academic support based on standardized test composite scores and high school grade point average (HSGPA), gender, international status, and type of high school attended—are factors, according to the theorists, that can affect student retention. As such, institutions should intervene using several theoretical approaches/models on student retention (Kerby, 2015).



## **Related Literature**

Related literature for this study includes a discussion of the following pre-admission factors: students' eligibility of academic support based on standardized test composite scores and high school grade point average (HSGPA), gender, international status, and type of high school attended. Based on the retention theories of Tinto, Astin, Spady and others, preadmission factors of students can both determine their success in college as well as offer the institutions insight for building viable retention programs. Resources are needed to educate the vast majority of students that are underprepared (Flores & Park, 2015). As a mechanism for providing resources, colleges and universities should create a culture of campus collaborations to include academic and social integration. Learning analytics, the systematic tracking of student progress and behavior patterns (Jansen, 1990), can be used effectively in the retention efforts of postsecondary educational institutions. Finally, a review of the literature related to counseling services, mentoring programs, test optional approaches to college admission, and non-cognitive variables and the impact on retention will be discussed.

### **Retention Pre-Admission Factors**

The four predictor variables for this study are defined by a student's eligibility of academic support based on standardized test composite scores and high school grade point average (HSGPA), gender, international status, and type of high school attended.

### **Academically Underprepared**

Even though they have completed high school, the results of college placement exams suggest many students are not prepared for the workload of college academics (Jackson & Kurlaender, 2014; Pratt, 2017). Students are classified as under prepared if earning scores below the college standard in any of the core subjects, reading, math and writing (Hughes, Gibbons, &

Mynatt, 2013). Underprepared students have deficits in content knowledge, course work, and learning strategies that would enhance successful matriculation in college (Cukras, 2006). While the high-school graduation rate is 83%, on the 2015, National Assessment of Education Progress (NAEP) report 37 percent of these graduates met the college ready standards and almost 70 percent of these graduates were headed to college after high school (Pratt, 2017). McGuire (2006) reported students from a wide variety of postsecondary institutions reported never learning how to study in high school. Essor, a high school graduate, said he passed without learning (Pratt, 2017). The Cooperative Institutional Research Program of over 400,000 college student compiled more confounding evidence that confirmed students earned high grades with low amounts of studying (Sax, 2003). It is reported that one in three first-time college students have academic deficits that require remediation (Byrd & MacDonald, 2005). Underprepared students have a propensity to drop out or have lower GPAs than their academically prepared peers (Radford, Berkner, Wheelless, & Shepard, 2010). In 2012, only 20 percent of remedial students enrolled in postsecondary schools earned a bachelor's within six years (Complete College America, 2012). Students taking a developmental reading course have completion rates of 17% (Conley, 2010).

A study conducted at Sacred Heart University considered the underprepared population based on SAT scores, an English Placement Exam and HSGPA. The findings of this study indicate underprepared students possess different needs and personality traits than prepared students (Melzer & Grant, 2016). Consistent with research by Deil-Amen and Rosenbaum (2002), the underprepared students in this study did not deem tutoring and counseling as essential to their college success (Melzer & Grant, 2016). Even, the significance of being active

in their field of study by participating in career readiness programs, seminars and internships was lacking in this cohort of underprepared students (Lease, 2004).

Liberal and open admission institutions offer students that struggle academically and may lack financial resources with an opportunity to earn a college degree (Jackson & Kurlaender, 2014). Although the population of first-time freshmen in colleges and universities is increasing, quality of those academically prepared for postsecondary rigor is decreasing (Carter-Wells, 1989). More specifically, many students enter college lacking necessary skills and have academic deficiencies vital to success (Astin, 1985). Ten percent of students who start college academically underprepared, even graduate (Lewin, 2014).

### **Pre-admission Factors**

Tinto's theory of student departure posits reasons why institutions struggle to retain students. Some factors influencing student retention can be attributed to characteristics and experiences occurring before the onset of college admission. Several scholars theorize pre-admission factors may influence completion by as much as two-thirds (Astin & Oseguera, 2005). These factors include but not limited to student's background, individual traits and academic history, which have influence students' decisions to stay the course in school or drop/stop out (Tinto, 2012). In the research of Tinto's theory of departure and of these pre-admission factors, little work has been done to isolate and pinpoint the potency of how these factors affect retention of students in higher education. Walpool (2007) noticed the practice to use pre-admission factors as a control variable and rather than variables included in the statistical manipulations. Reay (2012) is by indicating student's background characteristics as an influence in retention, is all but ignored in many research projects of retention. Sperry (2015) conducted research to determine which pre-admission factors contributed to students' retention and success during the first year

of college. The results found that several of the 13-variables used were useful in the prediction of student retention.

### **Merit-Based Academic Scholarships**

According to Long and Riley (2007), the primary barrier to college graduation for minority and low-income is college affordability. The affordability of college education has become increasingly cost prohibitive to middle-class families and is often out of reach for families of a lower socioeconomic status. The cost of tuition has surpassed inflation and family income (College Board, 2012). Even with the availability of financial aid, yearly tuition at a community college is at least \$8,000, more than \$12,000 at a public university (Broton & Goldrick-Rab, 2014) and more than \$25,000 a year at private universities (Sisolac, 2016). Federal loans have become increasingly inadequate to cover the price of the rising cost of college tuition even when considering the access to grants and institutional scholarships that reduce the net cost of tuition (Goldrick-Rab, 2016).

Lowering the cost of college by offering scholarships, grant and subsidies have been shown to increase college assess and completion (Dynarski & Scott- Clayton, 2013). Research suggests need-based aid has the most significant impact on low-income families (Wetzel, O'Toole, & Peterson, 1999). Further, offering support, grants, scholarships and other free money to students, helps to nudge the scale higher for those applying to four-year colleges (Harrison & Hatt, 2012; Jiyun, Desjardins, & McCall, 2009). A study of colleges in Indiana found that grants had a stronger effect on the persistence of Hispanic and African-American student than their White counterparts (Hu & St. John, 2001). Further, evidence from a national study found that grants improve the persistence of African-Americans more than that of any other cultural groups (John, Paulsen, & Carter, 2005).

Although studies detailing the benefits of receiving financial aid exist, there is a dearth of evidence that outlines the differences that aid recipients possess. The obscurity of understanding the impact of aid is the other factor that contributes to persistence, completion, and graduation such as academic preparation. The beneficiaries of need-based awards have a lower level of academic preparation and test scores than those of merit-based awards (Boatman & Long, 2016).

There are disparities in research about the predictive value of using high school GPA and standardized exams, yet some studies affirm the use of the predictive value (Kaplan, 1992; Willingham & Breland, 1982). Other researchers disavow the results (Crouse & Trusheim, 1991). However, there is agreement that use of both high school GPA and standardized exams has a better predictive value than using test scores alone (Kaplan, 1992; Willingham & Breland, 1982). Mouw and Khanna (1993), found that although the high school GPA and standardized test scores are the best predictors, 30% of the students forecast to succeed, fail and 50% of the students predicted to fail, graduate or were currently enrolled.

### **Standardized Test Composite Scores**

The importance of college admission testing has become increasingly significant, but the scholarship on the educational incongruence that they promote is limited. The vast majority of four-year institutions require students to take a standardized test (ACT or SAT) to secure not only admission (National Center for Education Statistics, 2013) but also access to scholarship funding. Moreover, the score on these tests may also be the gateway to affording college tuition, which has increased by over 5% in the past five years (Bradshaw & Dunietz, 2015). Across the United States, students understand the importance of scoring high marks on these tests.

Standardized test scores have offered much debate in determining the validity of these

tests to predict success in higher education. With over 30 years of experience, Sedlacek (2004) theorizes that the ACT and SAT are inadequate to determine which students should be admitted into college. Further, these tests may be adequate to measure the success of students that have had a White, Eurocentric, male educational experience. Additionally, these tests may be inadequate indicators of success for minorities, women, and even more so for predicting the success of African American males. Further, evidence has been reported that continually trumpet the success of women despite earning lower scores on standardized tests than men (Linn, 1973; Stricker, Rock, & Burton, 1993). Moreover, women have received higher grades than would be predicted by their SAT scores (Kling, Nofle, & Robins, 2012).

Over the decades, there have been social disparities influencing the outcome of standardized tests ranging from course selection, extracurricular opportunities, test scores, retention and graduation rates. Since the 1970's, the landscape of educational opportunities has experienced a significant shift seeking to close the gap to educational inequality. However, one-third of the racial divide in testing is related to socioeconomic factors of the students. Other factors such as discrimination, segregation, suburbanization and other factors account for the balance of the differences in scores that follow students in neighborhoods and schools that are funded based on a limited amount of resources (Charles, 2006).

Zoning of schools is often drawn based on the neighborhoods where the students live. The students live in neighborhood economically conducive to their family's financial abilities. The result of this zoning is that many students live in segregated communities and attend segregated schools. The funds for these schools are determined by the property taxes and value of the surrounding area. A study in 2009 found that 59% of students would have to relocate to a White neighborhood to have access to adequate educational opportunities (Massey, Rothwell, &

Domina, 2009).

Having access to a most rigorous course of study helps a student to have access to an increased probability of the information on student achievement and scores on standardized tests (Oakes et. al., 2000). However, students in districts that are predominantly minority and low socioeconomic status have a disproportionate selection of advanced placement (AP) classes. Oakes et al. (2000) and others have quantified that the amount of AP classes decreases as the number of minority student enrolled in a school increases. Additionally, the choice of placement of highly qualified and skilled teachers is often in districts that do not suffer from a lack of resources. Many minorities attend schools with fewer opportunities than their White counterparts contributing to the educational gaps in this society (Kelly, 2009).

### **High School Grade Point Average (HSGPA)**

Studies consistently link college retention to the achievement of students in high school using the grade point average (GPA) with the scores on standardized tests. In a study by Astin, students HSGPA and scores on standardized tests further confirmed that these measures were reliable predictors of retention (1987). In particular, students entering college with an A average versus a C average were seven times more likely to graduate within four years. Further, students with higher standardized test scores were more than five times more likely to graduate within four years. A coalition of researchers also highlighted the active link between HSGPA, standardized scores and student contentionsness as significant predictors of retention (Tross, Harper, Osher, & Kneidinger, 2000). According to Noel, Levitz and Richter (1999) institutions with the highest average standardized achievement scores of entering students have more than a 91% retention rate in first to second year retention rates. When GPA was tested in a logistic regression with non-cognitive factors suggested by Sedlecek, GPA was superior to measure

completion rate of minority students above ACT and SAT scores, non-cognitive other admission criteria variables (Schauer, Osho, & Lanham, 2011).

**Male.** The academic records of African American men show only 47% graduate from high-school which is about 20% less than counterparts (Schott Foundation for Public Education, 2010). Of the entire population of college students, the percentage of Black males in colleges and universities has remained stagnant at 4.8% over the past four decades (Strayhorn, 2010). The rate Black men complete postsecondary degrees dramatically lags behind females and all racial groups (Strayhorn, 2010). Some institutional factors that support the African American male in completing postsecondary school include summer bridge programs, removing financial barriers, and institutional responsibility for Black male engagement (Harpers & Davis III, 2012).

The prominence of HBCUs in educating the Black male population should not be underestimated. The median salary of Black males completing college is on par to match that of their white counterparts (Hilton & Bonner, 2017). The 61% of the male population are enrolled in institutions seeking to earn a degree (NCES, 2013). However, 12% of this total comprises the enrollment of Black males in a variety of institutions (NCES, 2013). Only 31% of this number represents the attainment of a degree from Black (NCES, 2014). Attending an HBCU would be a viable option for Black men as these institutions have the unique mission designed to address the disparities that are prohibitive in attaining a college degree (Palmer & Gasman, 2008).

**Female.** Historically, women earn lower standardized test scores than their male counterparts (The College Board, 2008) which may contribute to decreased opportunities at colleges or universities during an institutions admission and scholarship process based solely on a student's performance on college entrance exams (Kling, Nofle, & Robins, 2012). Justice Sonia Sotomayor of the United States Supreme Court recalls being thankful the admission



decision at Princeton University was not solely based on her score (Savage, 2009). Although, the relevance that standardized test score has in predicting college success there is a substantive and consistent gender difference that should be cogitated (Kobrin, Patterson, Shaw, Mattern, & Barbuti, 2008). The standardized test scores of males are generally higher than females. However, women typically earn higher grades than men (Nofle & Robins, 2007). Stated more generally, “standardized test over predict men’s grades but under predict women’s grades” (Kling, Nofle, & Robins, 2012, p. 600)

The role of HBCUs in educating black women is prominent (Farmer, Hilton, & Reneau, 2016). Data shows there are an increase in African American females enrolling in postsecondary institutions (Bennett & Lutz, 2009) nevertheless, the completion and graduation rates of Black females lags behind other cultures by over 10% (U. S. Census Bureau , 2009). In 2009, the U. S. Census Bureau reported that 20% of African American women over age 25 held an undergraduate degree, 49% of Asian American Women and 31.9% of White American Women (U. S. Census Bureau, 2009). Although the enrollment rate for African American females has doubled over the past decades, distinctive barriers may contribute to their sluggish graduation rates as compared to others (Winkle-Wagner, 2015).

**International students.** International students experience various challenges, which are not germane to natives that influence their success at colleges or universities (Perry, 2016). Such challenges are varied and are not limited to financial needs, teaching methods, loneliness, language barriers, and cultural disparities (Ota, 2013).

Although international students pass preliminary writing samples for entrance requirements into postsecondary schools, significant differences in language may impair a student’s ability to write essay exams and research papers (Kuo, 2011). Students whose primary

language is not English may find the difficulty adjusting to new word order, tense, pronunciation, vocabulary, etc., (Yin-Croft, 2012). These concerns pose an increased threat to positive retention (Fass-Holmes, 2016).

The legal requirements international students need to complete to secure permission to study abroad are an added stress not experienced by native students (Urias & Yeakey, 2009). The students must report their current status to the federal government's Student and Exchange Visitor Information System database (Association of International Educators, 2016). Some of the information required and must be submitted on a strict schedule. The international student must submit evidence of full-time status, evidence of satisfactory program progression, and requesting extensions as needed. Failure to acquiescence could result in termination of a students' 1-20 Form, which is the government's permission to study abroad (U. S. Immigration and Customs Enforcement, 2015). When this process is interrupted, students could be detained and prevented from continuing their education thus potentially having a significant impact retention and graduation (Neal, 2008).

### **Type of High-School Attended**

The comparison of academic achievement of public and private school can be traced back to the work of Coleman, Hoffer, and Kilgore (1982) when it was found that there was a private school advantage after taking a student's socioeconomic status into account. The details of the study included over 1000 schools and 60,000 students. This study measured a student's cognitive outcomes and propensity towards postsecondary school education (Simenc & Straus, 2106). Coleman found student factors such as parental involvement, educational attainment, and resources were the contributing factors helping explain the superior performance of private school students. This report, however, did not measure other aspects of family life that impact

students' life (Coleman, Hoffer, & Kilgore, 1982). Critics of the Coleman report found that including four additional variables than those used by Coleman, the results of the private school advantage be almost insignificant (Noell, 1982).

A longitudinal study conducted by the Center on Educational Policy, using data from 1988-2000, compared achievement and other factors of students attending comprehensive public schools with parochial, private, and independent schools. Included in the core findings of the study, private school students had higher SAT scores than their public-school counterparts, which gave them an opportunity to gain acceptance into more elite colleges. Moreover, the findings suggest the private schools are no better at teaching the academic material but may be better at providing test-taking strategies or may enroll students with a higher IQ initially. The conclusion of the study found that the most of the advantage that private school students possess could be contributed to demographics and family characteristics (Center on Educational Policy, 2007).

A comprehensive study was conducted compiling over 90 studies comparing public, charter and faith-based schools (Adventist Today News Team, 2017). The key findings of this study concluded that students who studied in particular denominational schools scored approximately one year ahead of their counterparts in charter or public school systems. Moreover, the achievement gap between minority students and those in the low-socioeconomic group was reduced by 25% of students attending these particular faith-based schools. The Cognitive Genesis, a four-year project that combined the results of the Iowa Test of Basic Skills (ITBS) and The Cognitive Abilities Test (CogAT) undergirds the conclusion that students who attended a faith-based school had a consistently higher academic achievement than all of their public-school counterparts (Trujillo, 2015).

This study population is part of the second-largest Christian school system (Kido, 2010) governed by a General Conference that has among its organization schools, hospitals, publishing houses, and a humanitarian aid group (Seventh-day Adventist World Church Statistics, 2013). This school system has 8,208 schools, colleges, and universities, with 102,779 teachers and 1,992,990 students worldwide (Department of Education: Seventh-day Adventist Church, 2008). This school found its beginning in the 1870s (Knight, 2015).

From a historical perspective, the early pioneers of this organization believed holistic education was central and should have a focus on character development, service, and general educational knowledge with a biblical foundation. According to Miller (1997), comprehensive educational philosophy boasts positive values while immersing oneself academically. Martin suggests holistic education is distinguished by its noticeable difference from other educational views because of its, "goals, its attention to experiential learning, and the significance that it places on relationships and primary human values within the learning environment (Martin, 2002). One of the organizations founding prophetess believed the educational institutions should have accredited programs. As such, many of its colleges and universities hold dual accreditations from both their accrediting body as well as regional accreditations. According to Knight (2015), the organization should continually seek to meet the needs of societal educational trends.

The study population comes from the only Historically Black College and University within this religious system. The denominational system has over 100 colleges and universities located worldwide divided into 13 divisions. There are seven colleges and universities in the East-Central Africa Division, two in the Euro-Asia Division, thirteen in the Inter-American Division, nine in the Inter-European Division, fifteen in the North American Division, five in the

Northern-Asia Pacific Division, thirteen in the South American Division, four in the South Pacific Division, five in the Southern Africa-Indian Division, seven in the Southern Asia Division, seventeen in the Southern Asia Pacific Division, six in the Trans-European Division, and three in the West-Central Africa. (G. C. Policy, 2011).

### **Retention Programs**

While open admission institutions have open doors for the majority of student earning a college degree, many of the students choosing to attend these institutions are academically, socially, and emotionally unprepared to be successful in such an environment. Giving students an opportunity to enroll without the proper support is counter-productive and unethical. Providing the support that underprepared students need once enrolled is essential to improving graduation rates.

Resources are needed to educate the vast majority of students who are underprepared (Flores & Park, 2015). Productive resources include fully integrated, robust mentoring, tutoring and advising systems (The JBHE Foundation, 2010). The goals of these systems are to orient students to the services, life, and practices of the college campus. This orientation ultimately helps to ground the student into the culture of an institution developing a sense of belonging as well as offering an academic foundation. Programs that have been promising are those programs utilizing the experiences of upperclassmen to mentor new students. More research should be conducted with the infrastructure and process of tracking and being proactive about the needs, of the student during enrollment. An institution should do what it must to retain the student who has enrolled. Colleges and universities can also include expanding advertising, ESL programs, and community action partnerships (Talbert, 2012).

In a compilation research effort to study peer institutions by Hanover, findings were substantial on providing programs that focused on retention of students from first to the second year. In fact, 17 of the 18 schools involved in the study provided a targeted experience for first time students. Further, 38% of these same schools offered retention programs focused on students during the sophomore year of school. Only one school, Villinova, had a focused retention program that could be identified by using secondary sources such as the school's website, attempted to bridge the gap from entrance to graduation (Hanover Research, 2010). This substantial investment of resources focusing on the first-year experience is sensitive to the research that suggests graduation rates rely the heaviest on the attrition rates of the first to second year (Levitz, 2001). Moreover, Levitz (2001) found attrition rates decrease by 50% each subsequent year. These statistics speak to the resources schools should invest in the freshmen experience. These programs seek to ease the transition between high school and college by mitigating five categories affecting retention rates: personal, social, academic, life issues and institutional challenges.

To bolster retention rates at North Carolina Agricultural and Technical State University (NCA&T), a public HBCU the administration sanctioned a holistic academic advising model during the fall of 2016 crafted to impact the retention rates of the African American male population (Andrea, Davis, & Scott, 2017). The aim of the holistic advising approach is to create a partnership to endow students with academic success skills, learning resources and support to be professionally, socially, and academically successful. Additionally, this approach was adopted to help increase the rate of retention and graduation among African American male students. The students included in this program had access to two academic advisors, one from their chosen academic department and the other one from the Center for Academic Excellence. Some of the

functions of The Center for Academic Excellence are to provide academic advising, academic monitoring, support and student success. The collaboration with these levels of high-touch advising provides students with academic support needed from their specific area of interest and funnels other social, personal, and academic needs through a department with the resources, staff, and training to help. A major part of the advising structure at NCA&T is the assessment of the freshmen by using the ETS Success Navigator to highlight shared needs, gaps which pinpoints the predictive analytics to manage the advising needs and caseloads (Andrea, Davis, & Scott, 2017).

Within the structure of the Center for Academic Excellence at NCA&T resides Project MARCH, a living learning community for first-year African American Males. At the crux of the program is a seminar class flooded with opportunities to interact with the student's academic coach and advisor in various settings throughout the semester. The lead teacher in the class is the academic coach with regular intentional meetings with the academic advisor. Weekly non-formal meetings in the residence hall are a staple of the program, providing informal interaction and engagement time with the students. Further students are invited to engage in personal development and learning by participating in bimonthly programs that focus on such things as balancing college life, dealing with stressors appropriately, critical thinking, and goal setting. To close the loop in the Project MARCH initiative, the students and coaches will participate in a global mission opportunity during the summer months as a team. The students will continue their shared experiences during their second year of enrollment by participating as a cohort in a writing and African American studies course with assignments geared to deepen the benefit of participating Project MARCH. Using the holistic advising model shows promise of increasing retention. Preliminary results by NCA&T showed a decrease of 36.4% of students being placed

on academic probation from the 2015-2016 to 2016-2017. A decrease of 4 percent of students placed on academic probation was seen in the students that participated in Project MARCH (Andrea, Davis, & Scott, 2017).

Being true to its mission, HBCUs enroll many students that are underprepared for college that would not otherwise have an opportunity to attend a postsecondary institution. Institutions should use this knowledge as a starting point for creating programs that would help diminish the obstacles for such students (Winston-Salem State University, 2010). Summer bridge programs are designed to supplement the academic needs of underprepared students by offering summer academic development and essential non-academic components of college life (Slade, Eaton, Staley, & Dixon, 2015). A staple of many summer bridge programs include writing and mathematics, an essential success marker of retention and academic success (Adams, 2012). A program that has been proven successful in moderating the obstacles of underprepared students is the bridge program designed and implemented by North Carolina's university system with records indicating an improvement of retention rates by as much as 13 percent (UNCGA, 2013). The results of the program show the retention rates of the participants outpace those of the general school population (Slade, Eaton, Staley, & Dixon, 2015). At North Carolina A & T State University eighty-eight percent of the student population is African-American, and inherently benefit from bridge programs.

A sometimes invisible international student demographic that garner more intentional support from HBCUs are students who racially identify as black but are not native-born United States citizens. These black students are citizens of such countries as the Caribbean, Africa, or Latin America and have inherent differences in culture, language, traditions, and ethnicity of native-born African Americans (Kent, 2007). Research on Black students often clumps the



native- and foreign-born black into one demographic if there is even a distinction (George-Mwangi, 2014). This grouping may undermine the sense of belonging on college campuses that is positively associated with psychological, academic and persistence (Pascarella & Terenzini, 2005; Strayhorn, 2012). Institutions could benefit their international retention efforts by providing more opportunities for student to deepen their sense of belonging on campus. Systems that nurture relationships that promote regular engagement with native faculty and native student support (Glass, Kociolek, Wongtrirat, Lynch, & Cong, 2015) and having a network of other international students helps to boost a students support system and combat feelings of homesickness (Ward, Bochner, & Furnham, 2001). The adjustment for international students is tolerated better when there is a network of international resources provided to navigate the demands of university life (Al-Sharideh & Goe, 1998). The currency of not achievieng a sense of belonging is many times depression, anxiety, withdrawal and hostility (Smith & Khawaja, 2011).

A qualitative research project that sought to understand the sense of belonging and the percieved needs of non-native black students was conducted at a mid-sized HBCU. In this institution, the majoriy of the five percent of the international student population had origins from the Caribbean and Africa (Mwangi, 2016). Students' sense of belonging was enhanced from involvement in positive campus programs, but despite these programs, many consider themselves to be on the margins of campus life (Mwangi, 2016). Preconceived ideas about the condition, behavior and culture of Black Americans, was found to put a wedge between native and non-native Black students. These stereotypes can be formally combated by institutions through orchestrating cross-cultural dialogue with native and non-native Black students to help

bridge the gap (Mwangi, 2016) instead of assuming a diverse student population would naturally lend itself to dialogue (Harper & Nichols, 2008).

Furthermore, HCBUs can strengthen their commitment to international students and foreign governments by participating in government initiatives to increase diversity. The partnership that HBCUs have with the U. S. Department of States and Brazilian Universities Exchange has garnered over 150 Brazillian students to study at more than 15 HBCUs, fully funded. North Carolina A&T State University and Delaware State University have implemented programs to ensure the viability of the international student community on campus (Lee, 2015).

The last three decades of research Tinto (1975, 1993) suggest that students persistence in college is closely linked to the strength of a student's academic and social connection with an institution. Factors that had the highest correlation to retention were academic skills, goals, and self-confidence (Robins & Lauver, 2004). A moderate relationship was noticed for such factors as institutional commitment, social involvement, financial support, among other factors. The factors that contributed to lowest correlation scores were achievement motivation and general self-concept (Robins & Lauver, 2004). A significant commonality that runs through many retention successes is the ability to positively manage both a student's academic and non-academic factors (Hanover Research, 2010).

### **Campus Collaborations for Retention**

According to Noel-Levitz, several colleges have been recognized to have successful retention programs for African-American students. Arkansas Tech University boasts a 16% increase in retention after implementing a bridge to excellence program that targeted the entire freshmen class and incorporating mentors to assess student needs. The College of New Jersey, Ewing has successfully initiated a minority mentoring program shows promise be increasing the

first to second-year retention rate for African American, Hispanic and general admit students from 40% to 91%. A successful part of this program is provided by minority upperclassmen as mentors to first-year students. The support that students need is crucial to retention. The Early Alert referral system LeHigh Community College used was vital to providing the resources needed to promote success: support, tutoring, counseling, financial aid, athletics, student life, etc. (Hammer, 2003).

Hostos Community College has found that it takes a cross-campus collaboration to impact retention (Rosario, Flemister, Gampert, & Grindley, 2013). Summer bridge programs have been found to help orient students to college life and increase retention and degree completion (Raines, 2012). The workshops held during summer bridge programs should be multidirectional that help to develop academic wholism (Guiliano & Sullivan, 2007). Even, recognizing the library as an engine for educational vigor, life and success are vital to supporting the academic needs of all students accepted at a postsecondary institution (Mathuews & Lewis, 2017). Holistic campus advising is another component of retention which has been successfully paired with career services, the residence halls and academic affairs (Starkey, 2015).

Retention programs are important. However, each program is just a piece of the puzzle. Every puzzle piece is vital to complete the retention picture and degree completion. Successful campus integration can only take place when all the entities of campus life work together, the administrators, faculty, staff, student leaders, and the community and are integral in the process of ushering students toward degree completion (Rosario, Flemister, Gampert, Grindlye, 2013).

### **Academic, Social, and Campus Integration**

Another caveat of Tinto's research that builds on a students pre-enty factors integral to retention, persistence and graduation rates is the degree to which a student is integrated in

academic and social systems of an institution (Tinto, 1993). In fact, Tinto (1975) states “it is integration into the academic and social systems of of college that most directly related [to the students] continuance in that college”(pp. 96). Academic integration services actively supports a student’s educational goal. These services could include, faculty collaborations, advisor meetings, mentoring, and study groups. Social integration refers to relationships that are built with other students by engaging in extracurricular activities such as clubs, social engagements, and sports participation (Tinto, 1993). Further, social engagement can be augmented by services made available to help students navigate psychological, family, and life challenges implicitly related to factors associated with persistence (Bishop K. K., 2016).

### **Faculty Collaborations**

Faculty members are at the foundation of academic integration. Programs that standardize faculty involvement in the academic integration process use various approaches with the end goal of strengthening the bond with students as they persist. These bonds are strengthened by mentoring, interactions, and classroom enhance (Pascarella & Terenzini,1991).

Roberts (2000) defines mentoring as a relationship when a more experienced and knowledgeable person actuates an encouraging and supporting relationship to facilitate growth. A standardized framework or definition of mentoring has not yet been adopted (Crisp & Cruz, 2009). The overarching themes of mentoring consist of emotional support, career plans, academic knowledge and being a role model (Nora & Crisp, 2007). The results of several studies support the use of mentoring and its positive impact on student persistence (Pagan & Edwards-Wilson, 2003; Salinitri, 2005). Many schools initiate mentoring programs to serve the “at-risk” population (Scisney-Matlock & Matlock, 2001). A program to mentor high-achieving African Americans suggest the optimal time to establish this relationship is at the initial entrance

into an institution involving the students with challenging activities and providing support and nurture (Freeman, 1999). Faculty mentoring works to enhance community and involvement which strengthens a student's satisfaction and commitment which helps bolster academic buy-in and social interactions leading to persistence and graduation rates (Salinitri, 2005). Hu and Ma (2010) discovered involving students in a strategic mentoring program significantly and positively impacts retention.

### **Learning Analytics**

There seems to be a consensus that use of using learning analytics by institutions can produce meaningful changes to customize learning and support for students. Learning analytics has been defined as the systematic tracking of student progress and behavior patterns (Jansen, 1990). Additionally, using this data may improve early identification of at-risk students and increase retention and student success (Jansen, 1990). Johnson (2014) describes learning analytics as deciphering trends and patterns for the advancement of teaching and learning. An international conference on learning analytics adopted the definition of, "the measurement, collection, analysis, and reporting of data about learners and their contexts, for the purposes of understanding and optimizing, learning and the environment in which it occurs" (Ferguson, 2012). Meisenhelder (2014) emphasizes that using learning analytics should assist institutions in providing access to success, opportunity, and careers and can be used effectively in the retention efforts of postsecondary educational institutions.

Learning analytics aid with retention because it can be used as a tool for identifying at-risk students as well as an evaluative tool for student engagement (Richards & Mullan, 2017). To identify at risk students, all data, from how often a student uses the library to a student's use of online tutoring services can be sent to one data warehouse. This student data is then compiled

and analyzed with both current and historical student data to identify those students in need of academic support. Research supports the effectiveness of these types of predictive models as a reliable mechanism to support student retention (Richards & Mullan, 2017). After identifying the at-risk population, it is incumbent upon the school to apply the appropriate interventions. The universities can then measure and assess the effectiveness of the interventions, adding necessary modifications prior to end of semester grades, student stop out, etc. Columbus State University College has recently used learning analytic with great success. This initiative, Complete College Georgia Initiative, identified six strategies to impact the retention of “underserved populations” (p. 12) the institution wanted to strengthen the partnerships with schools, increase college and career readiness, decrease time to degree completion, restructure instructional delivery, transform remediation, and utilized appropriate analytics. This initiative improved their overall retention rate to 4.2% and 5.7% for low-income students (Columbus State University, n.d.).

Learning analytics also helped North Iowa Area Community College to increase retention by helping them understand that by increasing student engagement, prompt follow-up with at risk students and personal contact from student services staff, their retention increased by 20%. Based on data from learning analytics, the college also found they were not contacting all students who were at risk. After making some adjustments they were able to realign how they assigned the at-risk students thus helping to get back on track quicker (Coley, Coley, & Lynch-Holmes, n.d.)

### **Counseling Services**

Often, low retention rates create a clear path to personal, psychological or emotional challenges of students. Students often forego services provided to support mental health

(Stalzer, 2011). The National Survey of College Counseling supports the growing need to provide counseling service on postsecondary campuses (Gallagher, 2012). In fact, 87% percent represents the steady increase in the students attending college with a psychiatric diagnosis and actively prescribe medication (Gallagher, 2012). Further, Stalzer (2011) suggest that the risk of attrition is higher for students with mental illness than those without. Thirty-nine percent of students utilizing counseling services on campus report having major psychological issues. However, 33% percent of those who sought care persisted in school despite these health challenges (Gallagher, 2012). Groups other than those diagnosed with a mental illness, benefit from the services of the mental health professionals on campus and support positive retention (Stalzer, 2011).

The results of the study conducted by high-risk students attending a small liberal arts college high-risk college students found significance in the rate of retention of student who used counseling services. In particular, significance was evident in high-risk and low-risk students that used counseling services. However, the retention rates of students with a low high-school GPA, low socioeconomic status or first-generation students remained constant (Bishop, 2016). This study did find the retention rates of low-risk students who used campus counseling services increased, further evidence that counseling services are a positive aspect of college campus retention programs (Bishop, 2016).

### **Mentoring**

Mentoring has been shown to have a positive impact on the college, academic performance, persistence rates and self-actualization among other things (Southerland & Gilmer, 2006). There is research to support mentoring as an approach to enhance student retention and success in college (Sorrentino, 2007). Mentoring relationships, in a variety forms (formal and

informal) have been shown to exist (Luna & Cullen, 1995). These relationships may be ones that are short-lived or extend through the years of the student's enrollment in college (Levinson, Carrow, Klein, Levinson, & McKee, 1978). Defining the individuals involved in mentoring is not an exact science. The following relationships have empirically shown to impact the mentoring process: faculty, staff, students, friends, family members, and spiritual leaders (Zalaquett & Lopez, 2006).

Senior students' mentor and tutor freshmen students with a low-cost impact on the institution (funded by Perkins Grant) majoring in Computer Information Systems (CIS) at New York City College of Technology. All freshmen majoring in CIS are required to enroll in CST110 (Introduction to Computer Systems) and CST110 (Problem Solving with Computer Programming) but many students are quite challenged by these courses. Based on the mentoring tutoring model, a faculty coordinator pairs the freshmen student with a senior student mentor and a senior student tutor. Each mentor is responsible for two mentees; likewise, the tutor is responsible for two students as well. The mentors are to provide guidance to their assigned mentees by providing support with family, work, life, balance, types of courses to take, and the like. The tutors are to help students with academic needs in course specific areas with network of faculty directors, mentors and tutors along with embedded opportunities to learn from guest speakers about career opportunities goals and expectations. The students have access to this supportive system helping them succeed and increase retention based on the data collected during this study. Students who were mentored and tutored earned higher grades than those not in the program. Additionally, the students were more likely to persist resulting in an increase of retention to approximately nine to twelve percent (Satyanarayana, Li, & Braneky, 2014).

### **Test Optional Approaches to College Admission**



Rendering admission decisions, scholarship awards, and acceptance primarily on a student's performance on standardized test increase the obstacles of entrance into postsecondary schools. In fact, the National Association of College Admission Counseling (2008) challenged institutions to consider the use of mandatory standardized test scores in a school's admission policy. A cadre of schools adopted test optional policies to gain college admission. This change immediately affected institutions cultural diversity, socioeconomic diversity, ethnic diversity, and interest diversity (Epstein, 2009). Moreover, the schools that adopted the test-optional approach signaled to its prospective students the relevance of what was learned in high school for successful matriculation (Cortes, 2013).

A profile-oriented admission policy can undergird the goals of retention and combat attrition in many institutions from the onset. It is purported that student bodies can be conditioned toward graduation success without trading access for selectivity (Cortes, 2013). Further, evidence suggests that given a High School GPA (HSGPA), standardized test scores provide little value to predicting academic progress (Cortes & Klaas, 2011). In a study comparing the differences in the progress of students admitted to colleges by submitting test scores versus those that did not, showed those submitting scores had a higher GPA by 3% percent, but the non-submitters had a slightly higher retention rate by 2%. The data indicates collectively the students did not submit test scores the same as or better than those that submitted. An additional similarity of institutions that adopted a test-optional admission policy is the emphasis that high school learning is valuable and an important predictor of college readiness and completion (Cortes, 2013). Notably, Supreme Court Justice Sonia Sotomayor admits without the admission process at Princeton, which went beyond relying on a standardized test, her future as a Justice might have been different (Savage, 2009). Sotomayor's case demonstrates

the narrow vision universities have when the admission decisions lean heavily on standardized test scores (Kling, Nofle, & Robins, 2012).

Cortes (2013) surmises that students are homo sapiens and subject to fluxes in their environment. It is nearly impossible to predict from pre-college factors, which students will persist all the way to graduation. DuPaul University that the progress that a student makes during the first year of enrollment may be a vital component to predicting retention and degree completion (Kalsbeek D. H. and Associates, 2009).

### **Non-Cognitive Variables**

In contrast to hinging college success of students on standardized test scores, Sedlecek and Brooks (1976), hypothesizes the use of eight non-cognitive variables would be a better indication success prediction in colleges for minority and non-traditional students. These eight variables are knowledge of a field of study, campus involvement, positive self-concept, realistic self-assessment, strong mentor, and commitment to long-term goals, understanding the political landscape, and leadership opportunities. Additionally, institutions fostering these variables with their student population would enhance success on the postsecondary level. Of course, there is opposition to the use of these variables as predictors of success in postsecondary schools. Several researchers cite problems and challenges with the use of these variables as tools to use for admission standards (Thomas, Kuncel, & Crede, 2007).

Continued research of Sedlecek's (2010) non-cognitive attributes shows significant strides with retention for those institutions embedding these attributes into the admission process as measured by entrance essays and other factors. Oregon State University has boasted higher retention rates since utilizing non-cognitive attributes into the admission process. Additionally, The Bill and Melinda Gate Foundation utilize components of Sedlecek's eight non-cognitive

attributes to select students to participate in the Millennium Scholar program. This program publishes a 90% six-year graduation rate, double the rate for students in similar socioeconomic situations (Sedlacek & Brooks, 1976).

Sedlecek (2004) argues non-cognitive assessments have value for all students. However, these factors are critical when assessing the retention predictability of the at-risk population because standardized tests do little emphasize the full potential of this group. A kaleidoscope approach has been adopted by Tufts University to undergird the admissions process that when evaluated has added positively to the retention efforts of the institution (Sternberg, 2010). In particular, this kaleidoscope approach utilizes the theory of intelligence by Sternberg (2010) designed to assess several non-cognitive strengths not captured by traditional admission standards such as HSGPA and standardized test scores. Tufts experience with using the “Kaleidoscope” undergirds academic opportunities and retention growth for the student that have a varied socioeconomic situation which would be overlooked with a traditional approach to the admission process (Sternberg, 2010).

Increasing the graduation rated of African American students could depend on institutions reviewing and identifying the underlying issues. A consideration of other aspects of admission that do not rely solely on GPA and standardized test scores (Schauer, Osho, & Lanham, 2011) is paramount. It has become more apparent students’ success in college is supported by a range of traits reaching beyond the scope of traditional admission standards (Sternbert, 2012). Additionally, the emphasis on non-cognitive characteristics has been an approach that supports retention efforts (Sedlacek & Brooks, 1976).

Institutions that need viable strategies to undergird retention efforts must consider incorporating non-cognitive factors into the profile of incoming students. As reinforced by

decades of research, non-cognitive and test-optional practices can be a win-win for students and for institutions (Zemsky, Shaman, & Iannozzo, 1997). One suggestion given is to decrease the weight of standardized test in an admission process by 28% while expanding the use of non-traditional factors in the admission process by 40% (Jasick, 2011). Thrasher (1966) asserted that the admission process would evolve to recruit and retain students on a broad spectrum of intelligence that cannot be captured by the simplicity of just GPA or test scores.

### **Recruiting and Retaining**

Postsecondary schools are doing decent work recruiting students who desire a traditional degree in education. Often a degree is essential to forming the platform for other highly competitive, skilled and necessary responsibilities, making the issue of retaining students vital. However, one in three first year students in postsecondary institutions will not return to school their sophomore year. Furthermore, according to research, only 59% of these students graduate within six years of beginning (NCES, 2017).

Consequently, many students that do not graduate have student loan debt without having obtained the education necessary to start a lucrative career (Olson, 2012). This debt is weight on the economy. Perhaps it would be advantageous to retain the students that have been laden with student loans. This way, the students would have a greater probability of graduating. This may increase the earning power and the ability to pay back the educational loans students have incurred. Institutions of higher education should explore retention programs that sustain the population of students initially enrolled as freshmen. An institution can benefit from aligning programs and curriculum with the immediate needs of the student population.

According to Noels research (1985) there are four stages of retention. First, researchers identified retention as a factor of admissions and enrollment management, which emphasized

predictive models of retention. Second, researchers looked for ways to reduce the attrition for at-risk students after they were enrolled. Third, research emphasis was placed on incorporating the entire campus curriculum and community to support the retention efforts of the university. Fourth, an emphasis was placed on hiring and retaining qualified, caring, faculty and staff that would positively support student retention.

Braxton (2000) notes most retention data is a combination of partial superficial studies of incomplete theories focusing on particular aspects of graduation, persistence, and attrition rates. Noel (1985) identifies shared themes such as under-preparedness, unrealistic expectations, and uncertainty, boredom and adjustment difficulties as been prominent areas to consider in retention research.

Relevant information can be found in the 2004 ACT policy report summarizing 20 years of data collection and national studies on academic advising and retention practices. In short, ACT recommends an integrated approach to retention with the following recommendations: (1) determine student needs based on their characteristic and setting priorities; (2) incorporating both academic and non academic by infusing socially inclusive environments that support connection and learning; (3) implementing early alert systems that assess, monitor and adequately support and respond in a timely consistent and useful way to at-risk students; (4) tracking retention efforts and creating commitments to continuous enhancements (Lotkowski, Robbins, & Noeth, 2004).

Documentation of retention studies suggests to maximize the benefit of retention programs a cyclical atmosphere must be adopted and every faculty and staff person must participate in the metamorphosis from admission to the graduation of a student. The viable components that have a significant impact on student success satisfied students and alumni,

competent, caring faculty and staff, and involved administration (Levitz, 2001).

### **Summary**

Concluding the themes in this literature review identifies the benefits of earning a college education for this society and on an individual level. This goal has created challenges for institutions of higher education and minorities in pursuit of a college education. Approaches to increase retention would offer more financial stability for families and institutions. Attrition cost the government, colleges, and individuals millions of dollars, lost productivity and missed opportunities to contribute to the growing global society of scholars.

The scope of this literature review elevates the importance that higher education supports critical skills, thinking, and careers that would keep the United States as a viable player in the global economy and society. The push to provide more access to students beyond high school has increased the diversity of the student populations in colleges and universities (Anderson, 2003; Freeman & McDonald, 2004). The diversity has granted opportunities for minorities, students with low socioeconomic status, and those academically challenged (Pascarella & Terenzini, 1991; National Center for Education Statistics, 2001).

Postsecondary schools enroll a considerable percentage of students that is impressive, retaining the students until graduation has been challenging with average graduation rates that peak at a mere 42% nationally (Cross & Slater, 2001) and 37% at HBCUs (JBHE, 2006). The importance HBCUs play in this equation is vital. Studying the pre-admission factors of the students that are enrolled in schools could offer some insight into the types of programs needed to increase retention rates (Astin & Oseguera, 2005; Reay, 2012; Tinto, 2012; Walpole, 2007). The benefit of studying students currently enrolled capitalizes on the theory of relationship marketing by Berry looking through the lenses of retention (Ackerman & Schibrowsky, 2007;

Berry, 1983; Boylan, 2009). The promise of increasing retention in colleges and universities is wrapped in the strength of researched collaborations with the entire campus community the specifically address the demographic that is recruited, admitted and ultimately enroll. The schools cannot prop up potentially successful programs without adequate fidelity, consistent evaluation, and a commitment to improvement and follow through (Lotkowski, Robbins, & Noeth, 2004; Rosario, Flemister, Gampert, & Grindley, 2013; The JBHE Foundation, 2010).

## **CHAPTER THREE: METHODS**

### **Overview**

The focus of this chapter is to expound on the design of this research project. The research question and the null hypothesis are explicitly stated. Further, a detailed explanation of the participants, setting, instrumentation, procedures and data analysis is examined in this section. Furthermore, the appropriateness of binary logistic regression as the statistical test is discussed predicting the odds of graduation and the pre-admission predictor variables.

### **Design**

This study used binary logistic regressions to analyze how accurately college graduation can be predicted from a combination of pre-admission factors of first-time freshmen. A regression was used to measure the strength of the predictor variables (pre-admission factors) and criterion variables (graduation) to include predicted probabilities associated with a combination of variables (Green & Salkind, 2014; Warner, 2013). This design was appropriate for this study because the outcome variable is dichotomous and the predictor variables are quantitative, coded categorically, or both (Warner, 2013). The specific subjects were measured on a variety of variables to determine if there was a predictive relationship that exists between the predictor variables gender, type of HS attended, international status, and eligibility of scholarship support based on HSGPA and standardized test scores and the criterion variable of graduation. This quasi-experimental design supports logistic regression analysis because the goal of this study was to predict the odds of graduation based on a student's scores on pre-admission factors (Warner, 2013), predictor variables.

### **Research Question**

**RQ1:** Can college graduation be predicted from a combination of pre-admission factors



of gender, type of HS attended, international status, and eligibility of scholarship support based on HSGPA and standardized test scores for first-time freshmen?

### **Hypothesis**

The null hypothesis for this study is:

**H<sub>0</sub>1:** There will be no significant predictive relationship between the criterion variable (graduation) and the predictor variables (gender, type of HS attended, international status, and eligibility of scholarship support based on HSGPA and standardized test scores) of first-time freshmen.

### **Participants and Setting**

The target population for this study was first time college freshmen (N=386) that enrolled in the particular Christian HBCU. The data articulation was a random stratified selection from the first-time freshman applicants. The cohort of students relevant to this study were full-time, degree declaring, first time freshmen during the fall semester of 2011 that graduated between 2015 - 2017, the defined graduation standard measures graduation rates as normal time and a half, which is a six-year graduation rate (Cook & Hartle, 2011; Selingo, 2012). The Department of Education tracks graduation rates of all student that receive Title IV funds which only accounts for 70% of students matriculating in higher education (Department of Education, 2016). The Integrated Postsecondary Education Data System (IPEDS) and the National Clearinghouse are other systems that calculate rates that do not account for all students (Cook & Hartle, 2011). While the acceptable means of measuring graduation rates is variable, at the host university, according to the Office of Institutional Effectiveness the six-year graduation rate in 2011 was 47.7% and is tracked based a cumulative cohort of first-time freshmen.

The study population represents the only Historically Black College and University within a certain religious system. The denominational system has over 100 colleges and universities located worldwide divided into 13 divisions. Incomplete data or students that do not fall within the study category have been excluded from the analysis. The demographics of the student population are approximately: African American 83%, Hispanic 3%, and other 14%. The current gender mix is 57% female and 43% male. Comparable demographics for both race and gender is represented in the sample population as well. Furthermore, 78% of the students enrolled are from out of the state, 22% in-state students with 7% of international students representing 25 different countries. Compare the characteristics of the population versus the sample in Table 3.1.

Table 3.1

*Characteristics of the 2011 Population vs. Sample*

| Characteristics           | Population N = 2006 | Sample n = 364  |
|---------------------------|---------------------|-----------------|
| Female                    | 57.0% (N = 1137)    | 61.8% (n = 225) |
| Male                      | 43.0% (N = 869)     | 39.0% (n = 139) |
| African American Students | 87.2% (N = 1750)    | 87.5% (n = 318) |
| Hispanic Students         | 1.0% (N = 21)       | <0.005% (n = 1) |
| Classified as other       | 4.5% (N = 89)       | 1.5% (n = 5)    |
| International Students    | 7.3% (N = 146)      | 11% (n = 40)    |

There were N = 364 data strands available for this study based on the 2011 first-time freshman cohort. The archived data from the registrar's office provided an adequate sample size of at least 10 times the number of predictor variables in the study understanding that the larger sample size

strengthened sufficient statistical power. The goal was to achieve a medium size effect with statistical power of  $n^2 = .07$  at the  $p = 0.05$  alpha level (Warner, 2013).

The location of this institution is in northern Alabama. The school is classified as a private, Christian HBCU with average enrollment of 1800 students. There are 16 academic undergraduate departments within seven schools. This school has residential accommodations with over 75% of the students living on campus. There are over 50 degrees that are offered by this school.

### **Instrumentation**

Acceptable means of measuring graduation rates is varied. The Department of Education tracks graduation rates of all student that receive Title IV funds which only accounts for 70% of students matriculating in higher education (Department of Education, 2016). IPEDS and the National Clearinghouse are other systems that calculate rates that do not account for all students (Cook & Hartle, 2011). IPEDS has defined standard measures of tracking graduation rates as normal time and a half, which is a six-year graduation rate. This rate will provide the most accurate information accounting for 100% of the students that are enrolled at the chosen institution.

### **Procedures**

Institutional Review Board (IRB) consent was secured from the participating institution and from Liberty University (see Appendix A). The institution's IRB process included permission from the Vice President of Faculty Research to initiate an IRB application. Once this was affirmed, an IRB application was submitted to the IRB chair. At the monthly IRB meeting, the decision to grant IRB approval for this project was based on 45 CFR 46 and 45 CFR 46 101 (b) (2) that the study qualified for Exempt Review and could continue (see Appendix B). After

the IRB process was approved, the approved application was forwarded to the Vice President for Academic Administration to procure the secure, clean data file from the registrar's office. A file with identifiers removed was submitted to the researcher by email. The data file was assigned an arbitrary label to protect against bias and to comply with Family Educational and Privacy Act (FERPA). During the preliminary phase of collecting the data, a sort was conducted to eliminate the data that was not pertinent for this particular study and test for erroneous data tracks. After this sort  $N = 364$ . Dummy variables were assigned to predictor variables that were not continuous, (i.e., academic scholarship eligibility, gender, international status, and type of high school). A randomized variable check was used on a small sample of data to test the data file and the SPSS analysis. Further, care was given to void the data of specific identifiers and check the accuracy of the data by inspection using an outside inspector for confirmation. As with a standard binary logistic regression the dichotomous outcome variable "graduation" was coded as: graduation = 0, no graduation = 1. Warner (2013) suggests that a code of 1 be assigned to the group with a more negative outcome and a code of 0 be reserved for the group with the more positive outcome.

### **Data Analysis**

Binary logistic regression analysis was used to predict the odds of a relationship between the criterion variable of graduation and the pre-admission predictor variables. Logistic regression analysis is used when there is one binary criterion variable based on multiple predictor variables (Warner, 2013). More particularly, the outcome variable in a logistic regression model is called a "logit," a log of odds. For this study to have an acceptable statistical power, the minimum sample size of  $N$  that is at least ten times  $k$ , where  $k$  represents the five independent variables in this study (Warner, 2013) was harvested. According to Warner (2013), the number

of participants needed for a regression analysis to provide adequate statistical power to detect a medium effect size is calculated using  $N > 104 + k$ , where  $k$  is the number of predictor variables. For this study, with  $k = 4$ ,  $N > 104 + 4$ ,  $N > 108$ . The sample size of 360 was well in excess of this minimum sample size.

A significant increase in odds is more likely when the sample size increases and the cell data is greater than 5. To this end, the frequencies in each Excel cell were inspected to screen data for frequencies greater than 5. If more than 20% cells have frequencies that are less than five, it is suggested to combine groups or eliminate them based on what is best. If outliers existed, care was given to decide whether to retain them or eliminate them with justification for either decision. After a preliminary check of the data, the following four assumptions were met to proceed. First, the outcome variable was dichotomous (Warner, 2013). Second, the scores on the outcome variable were statistically independent of each other. Third, the model included all relevant predictors and none that are irrelevant. Fourth, the categories on the outcome variable were mutually exclusive, that is a person in the study was a member of only one group but not both (Warner, 2013).

Sufficient statistical power is inherent by random selection of a sample size that is at least 10 times the number of predictor variables in the study. The goal was to achieve a medium size effect with statistical power of  $n^2 = .07$  at the  $p = 0.05$  alpha level (Warner, 2013). To understand the magnitude of the risk factors in a logistic regression, it is critical to report the probabilities and the odds associated with the strength of the predictors and criterion variables. Additionally, as supported by SPSS, Nagelkerker's  $R^2$ , a modified version of Cox and Snell's  $R^2$  was used to measure the amount of variance. Further to test the null hypothesis, the use of the Wald  $X^2$  statistic was calculated (Warner, 2013).

## CHAPTER FOUR: FINDINGS

### Overview

This quantitative study seeks to assess the predictive significance of pre-admission factors on graduation of first-time, full-time, freshmen enrolled in a Christian Historically Black University (HBCU). The study extrapolated archived data collected through the school's registrar's office for 2011 that terminated with the graduation status of the students by 2017. This section delineates the statistical results obtained through a binary regression analysis. The foundation of the statistics was ascertained by including descriptive statistics. Additionally, the baseline model was included to provide a cohesive and comprehensive statistical evaluation. The predictor variables include gender, type of HS attended, international status, and eligibility of scholarship. The strength of each predictor for each model was evaluated using the Cox Snell and Nagelkerke's pseudo  $R^2$  values. Statistical significance of each predictor variable was evaluated using the Wald chi-squared test. The odds ratios were used to summarize and deduce the outcome of each variable in the model.

### Research Question

**RQ1:** Can college graduation be predicted from a combination of pre-admission factors of gender, type of HS attended, international status, and eligibility of scholarship support based on HSGPA and standardized test scores for first-time freshmen?

### Null Hypothesis

**H<sub>0</sub>1:** There will be no significant predictive relationship between the criterion variable (graduation) and the predictor variables (gender, type of HS attended, international status, and eligibility of scholarship support based on HSGPA and standardized test scores) of first-time

freshmen.

### Descriptive Statistics

The data in this research study utilized data from 360 first-time, full-time, freshmen who enrolled in the host university during the fall semester of the 2011 school year. Frequency counts for each predictor variable is included in the examination of the data. A key summary of the statistics for the criterion and predictor variables can be found in Table 4.1.

Table 4.1

#### *Descriptive Statistics*

|             |                           | Frequency | Degree Conferred | Percent |
|-------------|---------------------------|-----------|------------------|---------|
| Scholarship | Premier Scholarship       | 63        | 46               | 73%     |
|             | Prestige Scholarship      | 53        | 31               | 58%     |
|             | Achievement Scholarship   | 105       | 65               | 62%     |
|             | Incentive Scholarship     | 63        | 28               | 44%     |
|             | No Scholarship            | 80        | 63               | 79%     |
| School Type | Neither Public or Private | 4         | 0                | 0%      |
|             | Public High School        | 177       | 83               | 47%     |
|             | Private High School       | 183       | 104              | 57%     |
| Citizenship | Non U.S. Citizen          | 40        | 24               | 60%     |
|             | U.S. Citizen              | 324       | 163              | 50%     |
| Gender      | Female                    | 225       | 129              | 57%     |
|             | Male                      | 139       | 58               | 42%     |

### Results

#### Data Screening

After the researcher received the data file from the registrar's office with each piece of data assigned arbitrary labels to protect against bias and comply with the Family Educational and Privacy Act (FERPA) of the host university, the data file was coded according to SPSS specifications. Additionally, each variable was inspected for veracity and deemed intact.

All variables were coded in SPSS in the following manner. The gender variable was coded as 0 – male, 1 – female. The citizenship variable was coded as 0 –US Citizen, 1 - US Alien. The variable that represents the type of school was coded as 0 - Public, 1 – Private. The type of scholarship variable was coded as 1 – Premier, 2 – Prestige, 3 – Achievement, 4 - Incentive, 5 – None. As with a standard binary logistic regression the dichotomous outcome variable “graduation” was coded as: graduation =0, no graduation =1. Warner (2013) suggests that a code of 1 be assigned to the group with a more negative outcome and a code of 0 be reserved for the group with the more positive outcome. After the researcher coded the variables, a randomized variable check was used on 10 samples of the data to test for accuracy of the coded data. The results of this randomized check were statistically accurate.

### **Assumptions**

After this preliminary check of the data, the following four assumptions must be met to proceed. First, the outcome variable is dichotomous (Warner, 2013). Second, the scores on the outcome variable must be statistically independent of each other. Third, the model must include all relevant predictors and none that are irrelevant. Fourth, the categories on the outcome variable are mutually exclusive, that is a person in the study can be a member of only one group but not both (Warner, 2013).

The Classification Table I (4.2) includes the percentage of students that graduated without including any of the predictor variables in the binary logistic regression. Table 4.2 shows 51.4% of the students earned a degree without considering any predictors.



Table 4.2

*Classification Table I*

|        | Observed           |                  | Predicted         |               |                    |
|--------|--------------------|------------------|-------------------|---------------|--------------------|
|        |                    |                  | Graduation Status |               | Percentage Correct |
|        |                    |                  | Degree Conferred  | Not Conferred |                    |
| Step 0 | Graduation Status  | Degree Conferred | 187               | 0             | 100.0              |
|        |                    | Not Conferred    | 177               | 0             | .0                 |
|        | Overall Percentage |                  |                   |               | 51.4               |

- a. Constant is included in the model.
- b. The cut value is .500

Table 4.3 and 4.4 further expands on the constant model that includes none of the predictor variables in the calculations. These tables represent baseline data to determine the influence of the predictor variables compared to the baseline model with no predictors included.

Table 4.3

*Variables in the Equation I*

|        |          | B     | S.E. | Wald | df | Sig. | Exp(B) |
|--------|----------|-------|------|------|----|------|--------|
| Step 0 | Constant | -.055 | .105 | .275 | 1  | .600 | .947   |

Table 4.4

*Variables not in the Equation*

|                    |           | Score           | df     | Sig. |      |
|--------------------|-----------|-----------------|--------|------|------|
| Step 0             | Variables | Gender (1)      | 8.377  | 1    | .004 |
|                    |           | Citizenship (1) | 1.339  | 1    | .247 |
|                    |           | School Type     | 7.830  | 2    | .020 |
|                    |           | School Type (1) | 4.273  | 1    | .039 |
|                    |           | School Type (2) | 2.769  | 1    | .096 |
|                    |           | Scholarship     | 47.819 | 4    | .000 |
|                    |           | Scholarship (1) | 14.285 | 1    | .000 |
|                    |           | Scholarship (2) | 1.258  | 1    | .262 |
|                    |           | Scholarship (3) | 6.551  | 1    | .010 |
|                    |           | Scholarship (4) | 1.464  | 1    | .226 |
| Overall Statistics |           | 59.106          | 8      | .000 |      |

**Results for the Null Hypothesis**

A binary logistic regression analysis was conducted to predict graduation from a combination of pre-admission factors of gender, type of HS attended, international status, and eligibility of scholarship support based on HSGPA and standardized test scores for first-time freshmen at a Historically Black University (HBCU) at the 95% confidence level. The results of the logistic regression for the Null Hypothesis was statistically significant,  $X^2(4) = 50.060, p < 0.05$ ,  $X^2(6) = 57.797, p < 0.05$ , and  $X^2(7) = 62.205, p < 0.05$ . See Table 4.5 for the Omnibus Tests of Model Coefficients.

Table 4.5

*Omnibus Tests of Model Coefficients*

|        |       | Chi-square | df | Sig. |
|--------|-------|------------|----|------|
| Step 1 | Step  | 50.060     | 4  | .000 |
|        | Block | 50.060     | 4  | .000 |
|        | Model | 50.060     | 4  | .000 |
| Step 2 | Step  | 7.738      | 2  | .021 |
|        | Block | 57.797     | 6  | .000 |
|        | Model | 57.797     | 6  | .000 |
| Step 3 | Step  | 4.407      | 1  | .036 |
|        | Block | 62.205     | 7  | .000 |
|        | Model | 62.205     | 7  | .000 |

The strength of the association between graduation and receiving a scholarship was moderate according to Cox and Snell's  $R^2$  (0.128) and Nagelkerke's  $R^2$  (0.171). The result shows that 12.8% to 17.1% of the variance in the criterion variable is being affected by the model with scholarship in the equation. The strength of the association between graduation and school type increased when this factor was added to the model but would still be considered moderate according to Cox and Snell's  $R^2$  (0.147) and Nagelkerke's  $R^2$  (0.196). The result increased the variance to 14.7% to 19.6% when scholarship and school type were added to the model. The strength of the association between graduation continued to increase when gender was added to the model with scholarship and school type, according to Cox and Snell's  $R^2$  (0.157) and Nagelkerke's  $R^2$  (0.210). The result shows that 15.7% to 21.0% of the variance in the criterion variable is being affected by the model that include gender, scholarship and school type. The Model Summary can be found in Table 4.6.

Table 4.6

*Model Summary*

| Step | -2 Log likelihood    | Cox & Snell R Square | Nagelkerke R Square |
|------|----------------------|----------------------|---------------------|
| 1    | 454.277 <sup>a</sup> | .128                 | .171                |
| 2    | 446.539 <sup>b</sup> | .147                 | .196                |
| 3    | 442.132 <sup>b</sup> | .157                 | .210                |

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

b. Estimation terminated at iteration number 20 because maximum iterations has been reached. Final solution cannot be found.

The Classification Table II (4.7) identifies the percentage accuracy with the addition of predictor variables entered at different steps. One will notice that the percent correct increases at each step from 65.9% to 68.4%. This indicates that the overall prediction variables added to the model of cases is improved over the 51.4% of the null model. See the Classification Table II 4.7 below.

Table 4.7

*Classification Table II*

|        | Observed           |                  | Predicted         |               |                    |
|--------|--------------------|------------------|-------------------|---------------|--------------------|
|        |                    |                  | Graduation Status |               | Percentage Correct |
|        |                    |                  | Degree Conferred  | Not Conferred |                    |
| Step 1 | Graduation Status  | Degree Conferred | 142               | 45            | 75.9               |
|        |                    | Not Conferred    | 79                | 98            | 55.4               |
|        | Overall Percentage |                  |                   |               | 65.9               |
| Step 2 | Graduation Status  | Degree Conferred | 142               | 45            | 75.9               |
|        |                    | Not Conferred    | 77                | 100           | 56.5               |
|        | Overall Percentage |                  |                   |               | 66.5               |
| Step 3 | Graduation Status  | Degree Conferred | 144               | 43            | 77.0               |
|        |                    | Not Conferred    | 72                | 105           | 59.3               |
|        | Overall Percentage |                  |                   |               | 68.4               |

The model was further analyzed for predictive significance using the Wald chi-squared test and the odds ratios produced from the analysis. The Wald chi-square test for being a scholarship recipient was statistically significant,  $X^2(4) = 42.629$ ,  $p < 0.05$ , indicating a significant predictive relationship. The Wald chi-square test for school type was not statistically significant,  $X^2(2) = 2.833$ ,  $p = 0.243$ , indicating that there was not a statistically significant difference in the odds of graduation by school type. The Wald chi-square test for gender was statistically significant,  $X^2(1) = 4.396$ ,  $p = 0.036$ , indicating that there was a statistically significant difference in the odds of graduation by gender.

Additionally, the odds ratios were examined to measure the associations between the predictor and criterion variables. The odds ratio factors with an exception of school type,

indicate a decrease in odds of falling into the target group when the predictor variable was added to the model as  $\text{Exp}(B) < 1$ .  $\text{Exp}(B)$  for both private and public school types are  $> 1$ . This statistic shows that there is an increase in odds of being in the target group when school type is included in the model. The factor of public school has 1.5 odds of falling into the target group of graduations. The factor of private schools has an astounding 1,664,557,899 more odds of falling into the target group. This information can be observed in The Variables in the Equation II, Table 4.8. Table 4.8 shows the analysis of all the predictor variables in the model.

Table 4.8

*Variables in the Equation II*

|                     |                 | B      | S.E.          | Wald   | df | Sig. | Exp(B)             | 95% C.I.<br>for EXP(B) |       |
|---------------------|-----------------|--------|---------------|--------|----|------|--------------------|------------------------|-------|
|                     |                 |        |               |        |    |      |                    | Lower                  | Upper |
| Step 1 <sup>a</sup> | Scholarship     |        |               | 42.629 | 4  | .000 |                    |                        |       |
|                     | Scholarship (1) | -2.305 | .394          | 34.231 | 1  | .000 | .100               | .046                   | .216  |
|                     | Scholarship (2) | -1.653 | .390          | 17.925 | 1  | .000 | .192               | .089                   | .412  |
|                     | Scholarship (3) | -1.795 | .339          | 28.011 | 1  | .000 | .166               | .085                   | .323  |
|                     | Scholarship (4) | -1.087 | .373          | 8.498  | 1  | .004 | .337               | .162                   | .700  |
|                     | Constant        | 1.310  | .273          | 22.972 | 1  | .000 | 3.706              |                        |       |
| Step 2 <sup>b</sup> | School Type     |        |               | 2.833  | 2  | .243 |                    |                        |       |
|                     | School Type (1) | 21.233 | 18717.33<br>2 | .000   | 1  | .999 | 1664557<br>899.394 | .000                   | .     |
|                     | School Type (2) | .384   | .228          | 2.833  | 1  | .092 | 1.468              | .939                   | 2.295 |
|                     | Scholarship     |        |               | 41.487 | 4  | .000 |                    |                        |       |
|                     | Scholarship (1) | -2.284 | .396          | 33.195 | 1  | .000 | .102               | .047                   | .222  |
|                     | Scholarship (2) | -1.611 | .393          | 16.841 | 1  | .000 | .200               | .093                   | .431  |
|                     | Scholarship (3) | -1.804 | .343          | 27.641 | 1  | .000 | .165               | .084                   | .323  |
|                     | Scholarship (4) | -1.086 | .376          | 8.351  | 1  | .004 | .338               | .162                   | .705  |
|                     | Constant        | 1.091  | .294          | 13.746 | 1  | .000 | 2.978              |                        |       |
| Step 3 <sup>c</sup> | Gender (1)      | -.501  | .239          | 4.396  | 1  | .036 | .606               | .379                   | .968  |
|                     | School Type     |        |               | 3.730  | 2  | .155 |                    |                        |       |
|                     | School Type (1) | 21.107 | 19380.41<br>6 | .000   | 1  | .999 | 1467027<br>050.565 | .000                   | .     |
|                     | School Type (2) | .448   | .232          | 3.730  | 1  | .053 | 1.565              | .993                   | 2.466 |
|                     | Scholarship     |        |               | 37.472 | 4  | .000 |                    |                        |       |
|                     | Scholarship (1) | -2.198 | .400          | 30.173 | 1  | .000 | .111               | .051                   | .243  |
|                     | Scholarship (2) | -1.551 | .395          | 15.415 | 1  | .000 | .212               | .098                   | .460  |
|                     | Scholarship (3) | -1.745 | .345          | 25.579 | 1  | .000 | .175               | .089                   | .343  |
|                     | Scholarship (4) | -1.094 | .378          | 8.379  | 1  | .004 | .335               | .160                   | .702  |
|                     | Constant        | 1.329  | .320          | 17.278 | 1  | .000 | 3.779              |                        |       |

- a. Variable(s) entered on step 1: Scholarship.  
b. Variable(s) entered on step 2: School Type.  
c. Variable(s) entered on step 3: Gender.

## CHAPTER FIVE: CONCLUSIONS

### Overview

A binary logistic regression was conducted to assess the predictive significance of pre-admission factors on graduation of first-time, full-time, freshmen enrolled in a Christian Historically Black University (HBCU). The study extrapolated archived data collected through the school's registrar's office for 2011 that terminated with the graduation status of the students by 2017. The foundation of the statistics was ascertained by including descriptive statistics. The predictor variables included gender, type of HS attended, international status, and eligibility of scholarship. The strength of each predictor for each model was evaluated using the Cox Snell and Nagelkerke's pseudo  $R^2$  values. Statistical significance of each predictor variable was evaluated using the Wald chi-squared test. The following sections analyze the specific findings.

### Discussion

This summary includes the key points to consider for this binary logistic research of pre-admission factors of gender, type of high school attended, international status, and eligibility of merit-based scholarships at a Christian HBCU. The descriptive results alone attest to the idea that non-cognitive factors, which were not included in this study, may benefit graduation more than academic prowess. As the pre-admission factors were added to the model using a forward stepwise regression, the strength of the associative variance increased accordingly, showing significance for gender and type of scholarship. The type of school attended was not significant in the model, but the odds ratio was such to be duly deliberated. Of the four preadmission factors, international status did not factor in the binary logistic equation because when using a forward stepwise regression model, variables are eliminated iteratively. Variables are eliminated



according to the appropriateness of the model design. The sample size for international status was 40 students. These students were 11% of the population.

The purpose of this logistic binary regression was to assess the significance of the following preadmission factors for the study population: gender, type of HS attended, international status, and eligibility of scholarship. There are some parallels between each of the preadmission factors and rate of college success. Tinto (2012), Astin and Oseguera (2005) theorize preadmission factors may influence student completion by two-thirds. Walpool believes it may be necessary to use preadmission factors as the control variable rather than the variables included in statistical manipulations (2007). An analysis was conducted on each of the factors to assess the significance between each of the factors.

### **Preadmission Factor One (Gender)**

Preadmission factor one examined if gender could predict graduation of first time full time freshman students at a Christian HBCU. Research on African American male gender trends in higher education reveals that of the entire population of college students, the percentage of Black males in colleges and universities has remained stagnant at 4.8% over the past four decades (Strayhorn, 2010). The rate Black men completing postsecondary degrees dramatically lags behind females and all racial groups (Strayhorn, 2010). Sixty-one percent of the male population is enrolled in institutions seeking to earn a degree (NCES, 2013). However, 12% of this total comprises the enrollment of Black males in a variety of institutions (NCES, 2013). Only 31% of this number represents the attainment of a degree from Blacks (NCES, 2014). Research indicates that attending an HBCU would be a viable option for Black men as these institutions have the unique mission designed to address the disparities that are prohibitive in attaining a college degree (Palmer & Gasman, 2008).

Research on African American female gender trends in higher education reveals the role of HBCUs in educating black women is prominent (Farmer, Hilton, & Reneau, 2016). Data shows there is an increase in African American females enrolling in postsecondary institutions (Bennett & Lutz, 2009). In 2009, the U. S. Census Bureau reported that 20% of African American women over age 25 held an undergraduate degree, 49% of Asian American Women and 31.9% of White American Women (U. S. Census Bureau, 2009). Although the enrollment rate for African American females has doubled over the past decades, distinctive barriers may contribute to their sluggish graduation rates as compared to others (Winkle-Wagner, 2015).

The binary logistic regression for gender revealed that once this factor was added to the model that the model remained significant ( $p < 0.05$ ) based on chi-square analysis. This value indicates that gender was a statistically significant predictor of graduation for first-time, full-time freshmen enrolled in a Christian HBCU. Additionally, the model fit indicated over one-fifth (21%) of variance was predicted during this block of factors. Moreover, the odds ratio of 0.606 for female indicates a moderate relationship that females have slightly better odds of being in the target group than males.

### **Preadmission Factor Two (High School)**

Preadmission factor two examined if type of high school could predict graduation of first-time full-time freshman students at a Christian HBCU. Research by Coleman, Hoffer, and Kilgore (1982) found a private school advantage after taking a student's socioeconomic status into account. Additionally, a longitudinal study conducted by the Center on Educational Policy, using data from 1988-2000, compared achievement and other factors of students attending comprehensive public schools with parochial, private, and independent schools. Included in the core findings of the study, private school students had higher SAT scores than their public-

school counterparts, which gave them an opportunity to gain acceptance into more elite colleges. Moreover, the findings suggest the private schools are no better at teaching the academic material but may be better at providing test-taking strategies or may enroll students with a higher IQ initially. A comprehensive study was conducted compiling over 90 studies comparing public, charter, and faith-based schools (Adventist Today News Team, 2017). The key findings of this study concluded that students who studied in particular denominational schools scored approximately one year ahead of their counterparts in charter or public school systems.

The binary logistic regression for type of high school attended revealed that once this factor was added to the model that the model remained significant ( $p < 0.05$ ) based on chi-square analysis. This value indicates that the type of high school attended was a statistically significant predictor of graduation for first-time, full-time freshmen enrolled in a Christian HBCU. Additionally, the model fit indicated a little less than one-fifth (19.6%) of variance was predicted during this block of factors. Moreover, the odds ratio of 1.47 for attending a public school compared to the odds ratio of 16,645,578,991 for attending a private high school indicate an overwhelming odd of being in the target group for students that fit in the latter category.

### **Preadmission Factor Three (International Status)**

Preadmission factor three examined if international status could predict graduation of first time full time freshman students at a Christian HBCU. Research on international students' matriculation in colleges and universities in the United States revealed international students experience various challenges, which are not germane to natives that influence their success at colleges or universities (Perry, 2016). Such challenges are varied and are not limited to financial needs, teaching methods, loneliness, language barriers, and cultural disparities (Ota, 2013). The legal requirements international students need to complete to secure permission to study abroad

are an added stress not experienced by native students (Urias & Yeakey, 2009). The international student may have significant differences in language and may impair a student's ability to write essay exams and research papers (Kuo, 2011).

The binary logistic regression for international status revealed that once this factor was added it did not hold enough weight to be included in the model. The descriptive statistics revealed that 60% of international students graduated within the measured time.

#### **Preadmission Factor Four (Eligibility of Scholarship)**

Preadmission factor four examined if eligibility of scholarship could predict graduation of first time full time freshman students at a Christian HBCU. A study of colleges in Indiana on students receiving academic scholarships revealed that grants had a stronger effect on the persistence of Hispanic and African-American student than their White counterparts (Hu & St. John, 2001). Further, evidence from a national study found that grants improve the persistence of African-Americans more than that of any other cultural groups (John, Paulsen, & Carter, 2005).

The binary logistic regression for eligibility of scholarship revealed that once this factor was added to the model that the model was significant ( $p < 0.05$ ) based on chi-square analysis. This value indicates that the eligibility of scholarship was a statistically significant predictor of graduation for first-time, full-time freshmen enrolled in a Christian HBCU. Additionally, the model fit indicated 17.1% of variance was predicted during this block of factors. Moreover, the odds ratio of 0.102 to 0.338 corresponds to eligibility of scholarship ranging from Premier to Incentive. In other words, students with a lower scholarship had slightly increased odds of graduating.

#### **Implications**

The preadmission factors in this study—a student's eligibility of for academic

scholarship, school type, and gender—are factors, according to the theoretical framework of this study, that can affect student retention. As such, institutions should intervene using several theoretical approaches/models on student retention (Kerby, 2015). The collective work of, Astin (1975), Braxton (2000), Spady (1971), and Tinto (1975), suggests that pre-entry factors will inform the intentions, goals, and commitments of students. The retention research of Bean and Eaton (2002) further expand these retention theories. Institutions should be intentional about sustaining and augmenting existing student relationships as a mechanism to support retention (Berry 1983). Institutions should utilize retention research to sustain effective programs and to create curriculums needed to support the relevant needs of all students (Astin, 1975; Pascarella & Terenzini, 1983; Tinto, 2012). This study impacts the field by providing evidence that preadmission factors could be a viable component of studying retention and completion trends that may affect graduation. As such HBCUs should pay special attention to each of the factors creating programming and interventions to further facilitate college success. Additionally, HBCUs should recruit specified student populations appropriate for their institutions. More specifically, since this study was conducted at a Christian HBCU in North Alabama, the findings may be more applicable to the student populations attending the Christian HBCUs across the nation. Most, if not all, of these colleges have denominational high schools. The portion of the student population in the study graduating from denominational high schools graduated with greater frequency than the study population attending public high schools.

The binary logistic regression analysis for being a scholarship recipient was statistically significant. The variance was moderate given that from 12.8% to 17.1% of the variance was associated with receiving a scholarship. However, when considering the odds ratio, being a scholarship recipient does not dramatically increase the odds of being included in the target

group although the odds increased as the scholarship amount increase, albeit not above 1. These findings contradict the research, which suggests that scholarships and grants increase persistence with minority groups. Several studies found that grants had a stronger effect on the persistence of Hispanic and African-American students than their White counterparts (Hu & St. John, 2001; John, Paulsen, & Carter, 2005). Compared to many HBCUS, the percentage of the target population receiving federal aid is significantly less at 46%. Students at some HBCUs may receive up to 70% of Pell Grant. This decreased percentage may account for the contradictory findings.

The logistic regression analysis for school type was statistically significant when added into the model. The variance was moderate given that from 14.7% to 19.6% of the variance was associated with school type. Additionally, the odds ratios were examined to measure the associations between the predictor and criterion variables. The odds ratio for public school had 1.5 odds of falling into the target group of graduations. The output for the odds ratio associated with students that attended a private high school, was substantial. These findings reiterate the research that students who studied in particular denominational schools fair better academically than others (Adventist Today News Team, 2017). Being that over 95% of the private schools that are the subject of this research were denominational, pointed efforts should materilize to strengthen the K-12 system as a direct conduit for completers at this instutution.

The binary logistic regression analysis for gender was statistically significant. When gender was added to the model, the variance was moderate at 15.7% to 21.0%. However, examining the odds ratio of gender, did not suggest an increase in the target group for either in this model. One could continue to support the academic needs of both male and female students to positively impact graduation rates.

### **Limitations**

While there are several limitations to this study, one of the most prominent is the application of this study to other populations. The sample was taken from a residential Christian HBCU and may not be applicable to other public universities or community colleges.

As a quasi-experimental study, there are other limitations inherent in these types of studies. Due to the lack of randomization, internal validity may be threatened and other pre-existing factors are not considered nor taken into account (William, Cook, & Campbell, 2002). For example, this study isolates specified preadmission factors but does not consider non-cognitive factors like grit, self-motivation, socioeconomic factors, and the like. The study is limited in that it focuses on graduation of the 2011 specified cohort at a Christian HBCU.

Based on use of the binary logistic regression statistical analysis, other limitations are inherent. The predictor variables are not all inclusive, as such, the variables do not consider other factors that may impede graduation. The researcher must choose and limit the predictor variables. If the correct variables are not used, nor the appropriate limitations applied, the results could be skewed and diluted leading to errors. If the variables have high multi-collinearity, the results could also be less defined. Finally, when using logistic regression, it is the assumption that “the predictor variables and the dependent variable is uniform”; however, this may not always hold true (Ranganathan, Pramesh, & Aggarwal, 2017, p. 150)

### **Recommendations for Future Research**

Recommendations for future students should include the following:

1. Replication of the study should be conducted in a variety of college settings to include institutions of higher learning such as public universities and community colleges.

2. Replication of the study should be conducted using additional preadmission factors such as the types of high school diplomas earned, family background, first-generation college student status, traditional, non-traditional, or transfer student, residential or non-residential student, and any non-cognitive preadmission factor.
3. A longitudinal study should be conducted to review the persistence, completion, and yearly graduation rates as they relate to the preadmission factors.
4. A mixed methods study should be conducted to validate the quantitative approach and home in on the complexities of student populations attending colleges and universities.
5. A qualitative study should be conducted to learn more about the experiences of successful and unsuccessful completers.
6. A quantitative study should be conducted that considers the interactive effects of high school type and scholarship.
7. A study should be conducted to analyze the success of students not only from private schools but also those with scholarship aid and without scholarship aid.



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APPENDICES

APPENDIX A

June 21, 2018

Tara L. Young

IRB Exemption 3382.062118: A Logistic Regression Study of How Pre-Enrollment Factors Predict Graduation at a Christian Historically Black University

Dear Tara L. Young,

The Liberty University Institutional Review Board has reviewed your application in accordance with the Office for Human Research Protections (OHRP) and Food and Drug Administration (FDA) regulations and finds your study to be exempt from further IRB review. This means you may begin your research with the data safeguarding methods mentioned in your approved application, and no further IRB oversight is required.

Your study falls under exemption category 46.101(b)(4), which identifies specific situations in which human participants research is exempt from the policy set forth in 45 CFR 46:101(b):

(4) Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects.

Please note that this exemption only applies to your current research application, and any changes to your protocol must be reported to the Liberty IRB for verification of continued exemption status. You may report these changes by submitting a change in protocol form or a new application to the IRB and referencing the above IRB Exemption number.

If you have any questions about this exemption or need assistance in determining whether possible changes to your protocol would change your exemption status, please email us at [irb@liberty.edu](mailto:irb@liberty.edu).

Sincerely,

**G. Michele Baker, MA, CIP**

*Administrative Chair of Institutional Research*

**The Graduate School**

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UNIVERSITY.

*Liberty University | Training Champions for Christ since 1971*

## APPENDIX B

Emailed from the IRB Chair of [REDACTED]

September 14, 2017 at 5:23 P.M.

Tara-

The IRB has reviewed the augments submitted for the protocol "Regression Study of Pro-Admission Factors and Graduation" and notes that the data base to be used has been scrubbed of pertinent identifiers as requested.

The IRB has determined according to 45 CFR 46 and 45 CFR 46 101 (b) (2) that the study qualifies for Exempt Review and therefore may continue.

Please contact me should you have further questions,

[REDACTED], PhD  
Chair, IRB