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FLORIDA INTERNATIONAL UNIVERSITY

Miami, Florida

THE IMPACT OF DEMOGRAPHIC, ACADEMIC, AND FINANCIAL VARIABLES ON PREDICTING FOUR- AND SIX-YEAR GRADUATION AT AN URBAN, PUBLIC, HISPANIC-SERVING INSTITUTION

A dissertation submitted in partial fulfillment of the

requirements for the degree of

DOCTOR OF PHILOSOPHY

in

HIGHER EDUCATION

by

Maria S. Rosado

2021

To: Dean Michael R. Heithaus
College of Arts, Sciences and Education

This dissertation, written by Maria S. Rosado and entitled The Impact of Demographic, Academic, and Financial Variables on Predicting Four- and Six-Year Graduation at an Urban, Public, Hispanic-Serving Institution, having been approved in respect to style and intellectual content, is referred to you for judgment.

We have read this dissertation and recommend that it be approved.

_____
Laura Dinehart

_____
Norma Goonen

_____
Daniel Saunders

_____
Benjamin Baez, Major Professor

Date of Defense: July 1, 2021

The dissertation of Maria S. Rosado is approved.

_____
Dean Michael R. Heithaus
College of Arts, Sciences and Education

_____
Andrés G. Gil
Vice President for Research and Economic Development
and Dean of the University Graduate School

Florida International University, 2021

DEDICATION

To my M&Ms - Mia, Matias, and Marcel

If there is anything that you learn from me, let it be that you can accomplish anything you set your mind to do, no matter how difficult. Always be resourceful, courageous, and never stop learning.

I love you the moon and back.

To my Pookie, my angel in heaven

You inspired me to be and do better, keep fighting, and love with all that I have.

I love you and miss you infinity and beyond.

ACKNOWLEDGMENTS

To my committee (Drs. Baez, Dinehart, Goonen, and Saunders) – thank you for your patience, guidance and advice. You saw something in me that I did not see in myself and I will forever be grateful that none of you gave up on me. Thank you for pushing and challenging me to finish.

To my husband, Ralph, and our children, Mia, Matias and Marcel – I know it was not easy to put up with me during this process, especially when I was stressed, cranky, and frustrated. Even when you had every right to get mad at me, you offered me hugs, kisses, and endless words of encouragement. You are my rock and my reason for all that I do. I expect you all to call me "Dr. Mama" from now on.

To my parents – thank you for the sacrifices you made so that I could receive the best education possible and for instilling in me a love of learning. If not for your unconditional love and help with the kids, this process would have been much more difficult. I share this degree with you. Dr. Mami and Dr. Papi, los quiero mucho.

To my work family – Thank you for your support and constant encouragement. Most of all, thank you for stepping in when I needed time to focus on my writing. You are all so amazing and inspire me to be a better leader, colleague, and role model.

To those who never stopped asking me when I was going to finish (some of the above included) – thank you for keeping me in check and not allowing me to quit (trust me, I thought about it). That simple, yet difficult to hear, question let me know that you believed I could do it; therefore, I believed it, too. Now I don't have to avoid you in the hallways, anymore.

Arlene, Danilo, Paden – you helped me more than you'll ever know. Thank you!

ABSTRACT OF THE DISSERTATION

THE IMPACT OF DEMOGRAPHIC, ACADEMIC, AND FINANCIAL VARIABLES ON PREDICTING FOUR- AND SIX-YEAR GRADUATION AT AN URBAN, PUBLIC, HISPANIC-SERVING INSTITUTION

by

Maria S. Rosado

Florida International University, 2021

Miami, Florida

Professor Benjamin Baez, Major Professor

Despite the rapid growth of the underrepresented population in the U.S., institutions of higher education have not experienced as rapid a growth in their underrepresented student population. Furthermore, it is estimated that in the next few years, more than 40% of jobs will require a postsecondary degree. As the underrepresented population continues to grow nationally and the job market is increasingly requiring job seekers to hold a postsecondary degree, it has become vital that the U.S. and states focus on educating and graduating its growing underrepresented population. The purpose of this study was to determine what demographic, academic, and financial factors contribute to graduation in four and six years for students attending a large, urban, public, research, Hispanic-serving institution in South Florida, where more than 75% of its students are from underrepresented groups.

Using a binary logistic regression, a sample of 30,119 first-time-in-college students admitted between 2010 and 2016 were analyzed to determine the significance of using selected demographic, academic, and financial variables to predict four- and six

year graduation, as well as to determine if the significance of those variables changed over time. The results of these analyses indicated that demographic, academic, and financial predictors were significant in predicting whether students graduated in four and six years. In addition, all three groups of predictor variables were individually statistically significant in predicting four- and six-year graduation; however, academic variables accounted for the largest amount of unique variance in both the four and six year models. Moreover, the results indicated that the demographic, academic, and financial variables that were significant in predicting four-year graduation were not the same as the ones that were significant in predicting six-year graduation, although there was some overlap. Overall, the results of this study contribute to the literature on student success and predicting four- and six-year graduation rates.

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ABBREVIATIONS AND ACRONYMS

ACT	American College Testing
AP	Advance Placement
BOG	Board of Governors
EFC	Expected Family Contribution
ERW	English, Reading, Writing
FAFSA	Free Application for Federal Student Aid
FAS	Florida Academic Scholars
FIU	Florida International University
FLBOG	Florida Board of Governors
FLDOE	Florida Department of Education
FMS	Florida Medallion Scholars
FSAG	Florida Student Access Grant
FTE	Full-time Equivalent
FTIC	First-Time in College
GPA	Grade Point Average
HSI	Hispanic-Serving Institution
IB	International Baccalaureate
MSI	Minority-Serving Institution
NCES	National Center for Education Statistics
SAT	Scholastic Aptitude Test
SUS	State University System

CHAPTER I

INTRODUCTION

Two thousand forty-four (2044) is the year the United States is expected to crossover into a majority-minority nation (Colby & Ortman, 2015; La Noue, 2003). According to a report recently published by the United States (U.S.) Census Bureau, the non-Hispanic White population will decrease from 62% in 2014 to approximately 44% by 2060, suggesting that 56% of the population in the U.S. will be ethnically and racially diverse (Colby & Ortman, 2015). Even more surprising are the numbers for the population of those who are under 18 in the U.S. In 2014, 48% of the child population in the U.S. were from underrepresented groups, compared to 38% of the entire population (Colby & Ortman, 2015). It is projected that by 2060, 64% of children will belong to ethnic and racial minorities (Colby & Ortman, 2015). Currently, Hispanics comprise 16.3% of the U.S. population, a 43% increase compared to the 2000 U.S. Census (U.S. Census Bureau, 2010). Florida has been experiencing changes in demographics, as well. The percentage of Florida's Hispanic population is even higher than that of the U.S. Twenty-three percent of Florida's population is comprised of Hispanics, many who live in Miami-Dade County – which is 64.3% Hispanic (U.S. Census Bureau, 2010). In the last two decades, Florida has seen its Hispanic population grow by 213% and it continues to grow at a fast pace (RISEP, 2012).

In 2009, President Barack Obama in a joint session to congress, challenged the nation to "once again have the highest proportion of college graduates in the world" and despite the rapid growth of the underrepresented population in the U.S., institutions of higher education have not experienced as rapid a growth in their underrepresented student

population. Although the number of underrepresented students tripled between 1976 and 2006, they continue to be underrepresented at all levels of higher education (Goldrick-Rab & Cook, 2011; Perna, Chunyan, Walsh, & Raible, 2010). Data from the National Center for Education Statistics (NCES) show that enrollment in institutions of higher education increased by 45% between 1997 and 2011. However, between 1976 and 2012, the percentage of Hispanic students attending institutions of higher education only rose from 4% to 15% and the percentage of Black students rose from 10% to 15%. (U.S. Department of Education, 2015). Although the undergraduate population has become more diverse in terms of race, gender, and social class; that diversity is not evenly distributed within Florida's State University System (Goldrick-Rab & Cook, 2011; La Noue, 2003). Table 1 displays the percentage of students enrolled in fall 2019 by race/ethnicity at each of the 12 universities in Florida's State University System (SUS), as well as system wide. Table 2 shows what percentage of Florida's Hispanic and Black students enrolled in fall 2019 were enrolled at each of the State's 12 public universities. In examining fall 2019 enrollment data for the SUS, 50% of Black and Hispanic students enrolled in the SUS were concentrated in two of the 12 universities in the System, Florida International University (FIU) and University of Central Florida (UCF). In fact, 57% of Hispanics are enrolled in Florida's SUS are enrolled at those same two institutions, with the largest percentage (34.2%) of Hispanics enrolling at Florida International University.

Table 1

Florida SUS Percentage of Students Enrolled by Race/Ethnicity, Fall 2019

Institution	White	Hispanic	Black	Asian	Other
State University System	44%	29%	13%	5%	9%
Florida Atlantic University	40%	28%	20%	4%	8%
Florida A&M University	3%	4%	89%	0%	4%
Florida Gulf Coast University	61%	23%	7%	2%	7%
Florida International University	9%	67%	12%	2%	10%
Florida Polytechnic University	63%	20%	6%	4%	7%
Florida State University	60%	22%	9%	2%	7%
New College of Florida	69%	18%	3%	4%	6%
University of Central Florida	47%	27%	11%	6%	9%
University of Florida	52%	23%	6%	9%	10%
University of North Florida	64%	13%	10%	5%	8%
University of South Florida	46%	22%	10%	7%	15%
University of West Florida	66%	10%	11%	3%	10%

Source: 2019-2020 Common Data Set Reports for each institution

Table 2

Florida SUS Hispanic and Black Student Headcount, Fall 2019

Institution	Hispanic		Black	
	# Enrolled	% Enrolled	# Enrolled	% Enrolled
State University System	82037	100%	35567	100%
Florida Atlantic University	6523	8.0%	4723	13.3%
Florida A&M University	316	0.4%	6647	18.7%
Florida Gulf Coast University	3073	3.7%	948	2.7%
Florida International University	28092	34.2%	4932	13.9%
Florida Polytechnic University	255	0.3%	75	0.2%
Florida State University	7132	8.7%	2889	8.1%
New College of Florida	126	0.2%	21	0.1%
University of Central Florida	18601	22.7%	7446	20.9%
University of Florida	7869	9.6%	2025	5.7%
University of North Florida	2289	2.8%	1691	4.8%
University of South Florida	6860	8.4%	3144	8.8%
University of West Florida	901	1.1%	1026	2.9%

Source: 2019-2020 Common Data Set Reports for each institution

Statement of the Research Problem

It is estimated that in the next few years, more than 40% of jobs will require a postsecondary degree (Haveman & Smeeding, 2006; Long & Riley, 2007). As the underrepresented population continues to grow nationally and the job market increasingly requires job seekers to hold a postsecondary degree, it has become vital that the U.S. and

the states focus on educating its growing underrepresented population. Postsecondary education is increasingly important to the nation's global competitiveness, as it is strongly related to economic mobility (Carnevale, Smith, & Strohl, 2010; Zumeta, Brebeman, Callan, & Finney, 2012). Not only do those without a postsecondary degree earn significantly less in wages than those with a postsecondary degree, but they also lack in social mobility, often falling out of the middle-income class and into the lower three quartiles of family income (Carnevale, et al., 2010; Haveman & Smeeding, 2006). According to Zumeta, et al. (2012), 41% of those who started in the lowest income quintile and earned a postsecondary degree had moved upward into higher income quintiles by age 40. In contrast, only 14% of those without a degree had done so (Zumeta, et al., 2012). Similarly, Carnevale, et al. (2010) argue that those with postsecondary degrees are more likely to receive formal training from their employers, than those with a high school degree, resulting in increasing the employee's marketability and earning power. A study conducted by Zumeta, et al. (2008) concluded that 31.1% of non-Hispanic whites ages 25 to 29 had a bachelor's degree or more, compared with 20.6% of blacks and 12.4% of Hispanics" (Zumeta, et al., 2012).

There are many benefits to postsecondary education, for both nation and individual. For a nation, it is vital for the country's global competiveness, economic growth, as well as increased civic engagement. For an individual, it means increased job opportunities, earning potential, as well as social mobility. Consequently, many states have changed the way in which they fund their public institutions of higher education in a way that will hold those institutions accountable for their output. Performance-based funding models is one funding method that many states have adopted in order to provide

public colleges and universities with economic incentives for their performance on various student and institutional outcome measures (Jones, 2014; Tandberg & Hillman, 2014; Dougherty & Reddy, 2011; St. John, 2004). These outcome measures, often referred to as metrics, can include retention and graduation rates, as well as campus diversity.

More than half the states in the U.S., including Florida, have already implemented or are in the process of transitioning to a performance-based funding model (Friedel, Thornton, D'Amico, & Katsinas, 2013). In Florida, state priorities and the Board of Governors (BOG) have set 10 metrics by which public universities are measured. One of those metrics evaluates universities based on the 4-year graduation rates of full-time, first-time-in-college (FTIC) students. Although four-year graduation rates have become the focus in Florida, many institutions also track six-year graduation rates, which are monitored by organizations who rank postsecondary institutions. With the State's efforts to increase four-year graduation rates and importance of six-year graduation rates for rankings, along with the growing number of Florida's Hispanic population, it is important to understand what factors have a significant impact on the graduation rate of that population. Almost 35% of Hispanic students enrolled at a Florida public, four-year institution are enrolled at Florida International University (FIU). In addition, FIU is the four-year institution that enrolls the largest number of Hispanics students in the U.S. and awards the most degrees to Hispanic students. As a result, this study will examine various factors that may affect four- and six-year graduation rates at Florida International University, an urban, public, Hispanic-Serving Institution (HSI) in South Florida.

Purpose of the Study

The purpose of this quantitative study was to determine what factors significantly predict graduation in four and six years for students at FIU, where more than 75% of its students are from underrepresented groups. Given the focus, both nationally and in Florida, to increase the number of people who attain a postsecondary degree, this study used already existing data to identify variables that help predict four- and six-year graduation. The demographic, academic, and financial data of students in seven first-time-in-college (FTIC) cohorts from 2011 through 2016 were examined to determine if they were statistically significant in predicting four- and six-year graduation. By determining the impact that demographic, academic, and financial predictors can have on graduation rates, new initiatives can be implemented to help address barriers to graduation and support student who are most at risk.

Several studies have suggested that exposing students in high school to a rigorous curriculum increases their chances of being successful in college (Cook, 2013). Specifically, programs that give high school students the opportunity to earn college credits while in high school, such dual enrollment, have been found to not only ease the transition to college, but also increase the probability of attaining a college degree (Karp, 2015). These findings, as well as the findings of this study, support increasing collaborations between school districts, colleges, and universities to expand access and availability of programs that allow students to earn college credits while in high school, while also educating students on the importance of selecting more rigorous courses when available.

Research Questions

The ten research questions for this study are:

Q1 - Do demographic, academic, and financial factors significantly help predict whether first-time-in-college students graduate in four years?

Q2 - Do demographic, academic, and financial factors significantly help predict whether first-time-in-college students graduate in six years?

Q3 - Do demographic factors better predict four-year graduation for first-time-in-college students than academic and financial factors?

Q4 - Do academic factors better predict four-year graduation for first-time-in-college students than demographic and financial factors?

Q5 - Do financial factors better predict four-year graduation for first-time-in-college students than demographic and academic factors?

Q6 - Do demographic factors better predict six-year graduation for first-time-in-college students than academic and financial factors?

Q7 - Do academic factors better predict six-year graduation for first-time-in-college students than demographic and financial factors?

Q8 - Do financial factors better predict six-year graduation for first-time-in-college students than demographic and academic factors?

Q9 - Did the independent variables that were significant in predicting four-year graduation rates change over time?

Q10 - Did the independent variables that were significant in predicting six-year graduation rates change over time?

Although there are many factors that may impact a student's ability to graduate in four or six years, this study will focus on factors that can be measured quantitatively, such as high school grade point average (GPA), standardized test scores, financial aid, gender, and race.

Significance of the Study

The results of this study support and contribute to many of the studies related to college completion and factors that contribute to predicting four- and six year graduation rates. Specifically, this study both supports and contradicts the literature available regarding high school GPA and SAT/ACT scores in predicting college success and completion. Astin (1993) and Allensworth and Clark (2020), determined in separate studies that high school GPA and SAT/ACT test are the strongest predictors of a student's performance in college. Neither the full model analysis on four-year graduation nor the full model analysis on six-year graduation support their findings. This suggests that the variables that predict four- and six-year graduation can vary and that there may be other factors that better predict college completion.

This study is also significant to the literature on the completion rates of Hispanic students who attend HSIs. Two studies conducted by Goldsmith (2011) and Hallinan (1998) determined that underrepresented students who attend universities that have a more diverse student body, faculty, and staff, perform better than their peers attending less diverse institutions. Although this study did not examine the diversity of faculty and staff, the diversity of the student body is highlighted. As such, this study supports the findings of Goldsmith and Hallinan in that Hispanic students at the institution examined

have higher odds of graduating in four or six years as compared to White students who also attended that same institution.

In addition to its significance and contributions to the current literature, the findings of this study provide valuable insight to higher education practitioners, as well as policy makers. First, policy makers can use the findings related to the impact of financial variables on graduation rates to reevaluate and reallocate funds in state aid programs, both merit- and need-based. Second, since academic preparation prior to college is still significant in predicting graduation, higher education practitioners can use the findings of this study to expand partnerships with local school districts and programs, such as dual enrollment. Lastly, this study provides pertinent information to higher education administrators to build or improve predictive models for completion.

Definitions

Accelerated Credits – for the purposes of this study, accelerated credits refers to college credits earned via dual enrollment and/or Advanced Placement (AP) or International Baccalaureate (IB) programs.

First-Time-in-College (FTIC) – is a term commonly used in higher education to refer to students admitted into an undergraduate institution for the first time, typically right out of high school. In Florida, the definition also includes students who attended an undergraduate institution after high school, but earned less than 12 credits (Florida Board of Governors, 2021).

Cohort – are students admitted to the university during the same academic year and enrolled full-time (minimum of 12 credits) during their first fall term (Florida Board of Governors, 2020).

Performance Funding Model – a funding model used in various states, including Florida, to determine how much funding a public university will receive in a given year. The goal of this model is to hold universities accountable for their performance on a variety of state-defined priorities and metrics, such as graduation and retention rates (Jones, 2014).

Four-year Graduation – FTIC cohort students who graduate within four years and by the fourth summer after entry (Florida Board of Governors, 2020).

Timely Graduation or Graduating "on-time" – Refers to graduating in four-years as defined above.

Race/Ethnicity - for this study, students will be classified as White, Black, Hispanic or Other. This information is self-reported by students on their university admission application.

Unweighted GPA- high school grade point average based on the traditional 4.0 scale.

Weighted GPA – high school grade point average based on a 5.0 scale that takes into account course difficulty, such as honors, advance placement, etc.

State aid – scholarships awarded by the state to a student, whether merit- or need-based. For the purposes of this study, state aid includes the Bright Futures Scholarship and the Florida Student Assistance Grant Program.

Federal aid – Financial aid awarded by the U.S. Department of Education. For the purposes of this study, federal aid refers to the Pell Grant and student loans.

SAT – Scholastic Aptitude Test, a standardized test used for college admissions.

ACT – American College Testing, a standardized test used for college admissions.

Summary

The number of people in the U.S. from underrepresented groups continues to grow at a rapid pace. In addition, national and state priorities have shifted their focus toward college completion rates in an effort to increase the number of people in the U.S. who hold a college degree. If the U.S. is to increase the number of people with college degrees, then special attention needs to be paid toward increasing college access and completion for students from underrepresented groups. It will also be prudent to gain a better understanding of the factors that predict graduation for these students.

As states continue to put pressure on institutions of higher education to increase graduation rates and many are tying funding to their performance on various student success measures, institutions of higher education are trying to find ways to better and understand and increase persistence and completion. This research study was intended to provide these institutions with a better understanding about what variables significantly impact four- and six-year graduation for students. More specifically, what demographic, academic, and financial factors help predict graduation. By analyzing data from students from FIU, which enrolls a large number of students from underrepresented groups, the results of this study were aimed to providing additional insights on variables that have a significant impact on four- and six-year graduation for underrepresented. In addition, this study was also aimed at contributing to the literature related to college completion and student success. The results of this study support the literature indicating that academic variables continue to be the strongest predictors of college completion, specifically performance in high school. Considering that high school academic information is available prior to student's starting college, university administrators can use this

information to identify and build programs that support students who are identified as at-risk.

CHAPTER II

LITERATURE REVIEW

In 2009, President Barack Obama challenged the nation to "once again have the highest proportion of college graduates in the nation." Since then, many quantitative and qualitative studies have focused on college access, persistence, and completion in an attempt to provide institutions of higher education with a better understanding on how to retain and graduate more students. More recently, the push to completion has also been tied to the time it takes students to complete the degree. In other words, not only is it important that students finish their degree, but also the amount of time in which they complete the degree, most commonly measure in four or six years. As such, many states have shifted the way they fund their institutions of higher education to a model that holds them accountable based on their performance in a variety of areas, including degree completion. Furthermore, as the nation's underrepresented population continues to grow, this study aimed to better understand and identify factors that can play a role in underrepresented students' decision to attend college, as well as their completion time.

Many factors can impact a student's decision to attend college. This study focused on the demographic, academic, and financial factors that can impact persistence and completion. In an effort to gain a better understanding on how these three areas (demographic, academic, and financial) can impact access, persistence, and completion, this chapter will explore the literature regarding college preparedness, college access, completion rates, financial aid, and underrepresented students, as well as other areas that impact on college completion, such as socioeconomic status.

Performance-Based Funding

In recent years, many states have changed the way in which they fund their public institutions of higher education. Historically, states funded their public universities based on access and the number of full-time equivalent (FTE) students enrolled at the institution; however, more recently states have shifted away from funding colleges and universities based on FTE and instead are funding based on an institution's performance on several accountability measures. This model of funding, referred to as performance-based funding, determines the amount of funding public colleges/universities will receive based on their performance on metrics and goals that are usually set by the state leaders.

Performance-based funding models are a way for states to provide public colleges and universities with economic incentives for their performance on various metrics set forth by the states as student and institutional outcome measures (Jones, 2014; Tandberg & Hillman, 2014; Dougherty & Reddy, 2011; St. John E., 2004). These outcome measures, often referred to as metrics, can include retention and graduation rates, as well as campus diversity. In addition, performance-based funding models are meant to prompt change in institutional behavior by linking state funding to public higher education with state priorities (Dougherty, Natow, Hare, Jones, & Vega, 2011; Dougherty & Reddy, 2011; St. John E., 2004). In other words, public colleges and universities are being evaluated (and funded) on their ability to meet state goals using metrics. More than half the states in the U.S., including Florida, have already implemented or are in the process of transitioning to a performance-based funding model (Friedel, Thornton, D'Amico, & Katsinas, 2013). Figure 1 shows the states that have already implemented performance-

based funding models, as well as those that are currently transitioning to a performance-based funding model.

Performance-based funding models can have negative and unintended consequences on Minority-serving institutions (MSIs) (Jones, 2014) and can worsen inequities that already exist for underserved students (Umbricht, Fernandez, & Ortagus, 2017). One such consequence is limiting access to a postsecondary education to underrepresented students. Critiques of performance-based funding models have cautioned that "the most direct path to increased graduation rates is for campuses to become more selective" (Jones, 2014, pp. 7-8). Consequently, state legislatures must design performance-based funding models that do not impede, but rather cultivate, the effectiveness of MSIs in order to meet their completion goals (Jones, 2014).

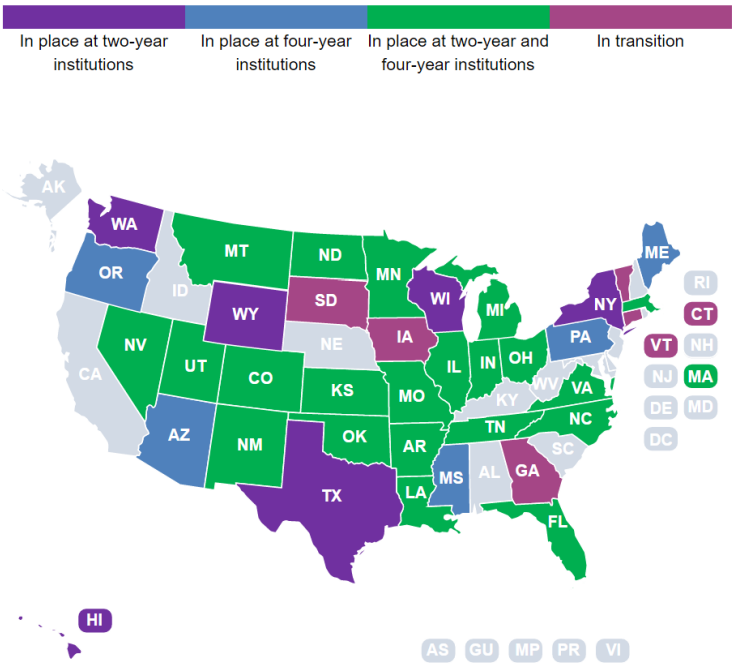

Figure 1. States with or transitioning to performance-based funding models.
Reprinted from Performance-based funding for higher education, in National Conference of State Legislatures. Retrieved March 7, 2018, from http://www.ncsl.org/research/education/performance-funding.aspx.

In Florida, a performance-based funding model was implemented in 2014. According to the Florida Board of Governors (FLBOG) website on performance-based funding, the model has "four guiding principles: 1) use metrics that align with SUS Strategic Plan goals, 2) reward excellence or improvement, 3) have a few clear, simple metrics, and 4) acknowledge the unique mission of the different institutions" (Florida Board of Governors, 2021). Keeping these guiding principles in mind, ten metrics were developed to evaluate all 12 of Florida's public universities, nine which are common to all institutions and one which is selected by each institutions Board of Trustees, based on that institutions mission and goals. Six of the nine shared metrics focus on undergraduate student success, specifically, retention, graduation, cost of degree, and post-graduation success as measured by employment, earnings, and/or continued enrollment at a university (see Figure 2).

Metrics Common to all Institutions	
1. Percent of Bachelor's Graduates Employed (Earning $25,000+) or Continuing their Education	**6.** Bachelor's Degrees Awarded in Areas of Strategic Emphasis
2. Median Wages of Bachelor's Graduates Employed Full-time	**7.** University Access Rate (Percent of Undergraduates with a Pell-grant)
3. Average Cost to the Student (Net Tuition per 120 Credit Hours)	**8a.** Graduate Degrees Awarded in Areas of Strategic Emphasis **8b.** Freshman in Top 10% of Graduating High School Class – for NCF and FL Poly only
4. Four Year Graduation Rate (Full-time FTIC)	**9a.** Two-Year Graduation Rate for FCS Associate in Arts Transfer Student **9b.** Six-Year Graduation Rate for Students who are Awarded a Pell Grant in their First Year **9b.1** Academic Progress Rate, 2nd Year Retention for FTIC with a Pell Grant – for FL Poly only
5. Academic Progress Rate (2nd Year Retention with GPA Above 2.0)	**10.** Board of Trustees Choice

Figure 2. Metrics common to all public universities in the State of Florida.
Reprinted from Board of Governors Performance Funding Model Overview, in the Florida Board of Governors. Retrieved April 7, 2021 from https://www.flbog.edu/wp-content/uploads/Overview-Doc-Performance-Funding-10-Metric-Model-Condensed-Version-Mar-2021.pdf

Although the retention, cost of degree, and post-graduation metrics have remained unchanged since the inception of the performance funding metrics in Florida, the graduation metrics have seen some changes over the past few years. When first developed in 2014, universities were evaluated on the six-year graduation rates of their first-time-in-college students; however, in 2018, the state legislature approved to change it from a six-year graduation rate to a four-year graduation rate. More recently, the state legislature removed a metric that focused on the percent of students graduating with excess credits (credits earned beyond those required for their degree), and replaced it with a metric evaluating universities on their two-year graduation rates for students who transferred with an Associate of Arts degree from one of Florida's public colleges.

Student Access to Postsecondary Education for the Underrepresented

Inequities in the education system in the United States have existed for a long time and efforts have been made to address these inequalities. One such effort, was the No Child Left Behind Act of 2001 which brought attention to racial disparities in academic achievement (Fletcher & Tienda, 2010). Underrepresented, specifically Black, Hispanic, Native American, and low-income students, were of particular concern. Several studies have found that many of the achievement gaps of underrepresented and low-income students are due to differences in the schools they attended, as well as achievement gaps widening over time (Steifel, Schwartz, & Ellen, 2006; Kao & Thompson, 2003). These achievements gaps can often have an influence on a student's decision to pursue a postsecondary degree. A report published by Excelencia in Education (2020), an organization that promotes student success in higher education for

Hispanic students, stated that the graduation rate of Hispanic students was 12 points lower than that of White students.

Hispanic-Serving Institutions

Minority-serving institutions (MSIs), which are attributed with enrolling a large number of underrepresented students, have been around for decades. There are three types of institutions classified as MSIs: Historically Black Colleges and Universities (HBCUs), Tribal Colleges, and Hispanic-Serving Institutions (HSIs). The oldest of these are the HBCUs, with HSIs being the youngest. Whereas HBCUs and tribal colleges were intentionally created to serve specific populations and increase access to Blacks and American Indians, HSIs were not created to serve a specific population but rather evolved due to their location and proximity to the Hispanic population (O'Brien & Zudak, 1998; Gasman, Nguyen, & Conrad, 2015). HSIs began to be recognized after the 1992 amendment of the Higher Education Act of 1965 and are defined as accredited, degree granting, non-profit institutions with a minimum undergraduate, full-time equivalent, Hispanic enrollment of 25% or more (Gasman, Nguyen, & Conrad, 2015).

Although HSIs have a rather short history, their growth has been dramatic. The Hispanic Association of Colleges and Universities (HACU) reported 78 institutions in 1986 with 25% or more of Hispanic enrollment. By 1994 HSIs increased to 125 institutions and enrolled 42% of the Hispanic population attending colleges and universities (O'Brien & Zudak, 1998). By 2018 the number of HSIs grew to 539 institutions present in 27 states, the District of Columbia and Puerto Rico, comprising 17% of all US institutions of higher education (Excelencia in Education, 2020). Furthermore, 54% of HSIs are 4-year institutions and it is estimated that 67% of Hispanic

students enrolled in a postsecondary institution in the US are enrolled at an HSI (Excelencia in Education, 2020). O'Brien and Zudak (1998) and Jones and Kauffman (1994) suggest that HSIs can be viewed as commuter institutions due to the majority of their students being from the community that surrounds these institutions; therefore, it is no surprise that the states with the highest number of HSIs are also the states with the largest Hispanic populations (see Figure 3). Lastly, studies have shown that underrepresented students who attend universities that have a more diverse student body, faculty, and staff, perform better than their peers attending less diverse institutions (Goldsmith, 2011; Hallinan, 1998). Consequently, HSIs are a critical component in discussions related to increasing the percent of Hispanics with a postsecondary degree.

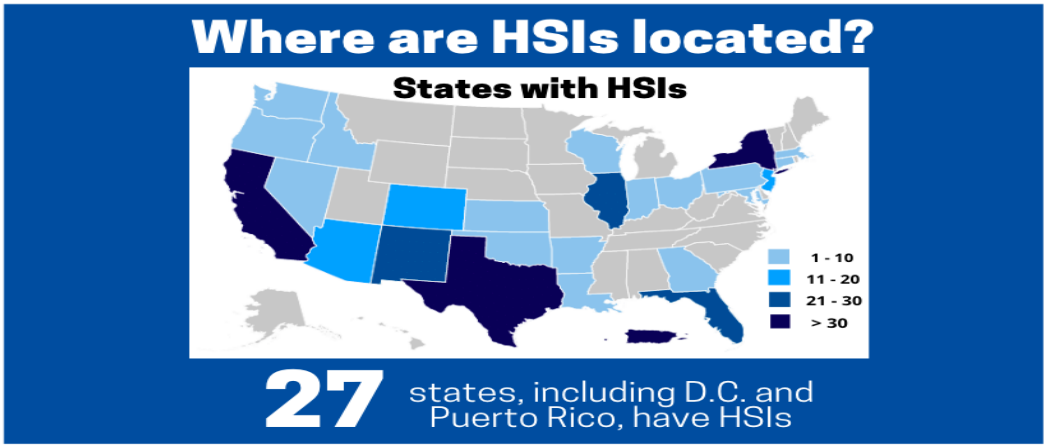

Figure 3. Locations of Hispanic-Serving Institutions (HSIs)

Cost of Attending College

The cost of obtaining a postsecondary degree can have a significant impact on a student's choice to attend college and many factors can affect that cost. Three such factors are: 1) the number of credits taken over the minimum required; 2) amount of time it takes to complete the degree; and 3) the amount of financial aid received. The cost of

earning a postsecondary degree has increased dramatically in the last several years. Just a few years ago it was possible to work a little over 20 hours per week at minimum wage and still be able to pay the cost of attending a public university (Goldrick-Rab & Cook, 2011). Today, it would take 72 hours per week of minimum wage work to pay for the cost of a college degree at a public institution. Nationally, tuition and fees increased by 439% from 1982 to 2007 (Boehmer & Webber, 2008; Dreifus & Hacker, 2010; Goldrick-Rab & Cook, 2011). To exacerbate the issue, the median family income in the United States has not seen the same increase as compared to college tuition, but rather has seen very little increase since the 1970s (see Figure 4). Furthermore, student loan debt is at its highest, having already passed a trillion dollars (Complete College America, 2014). Nonetheless, the longer it takes a student to complete their degree, the more it will cost students – approximately $14,000 for each year at a four-year public institution.

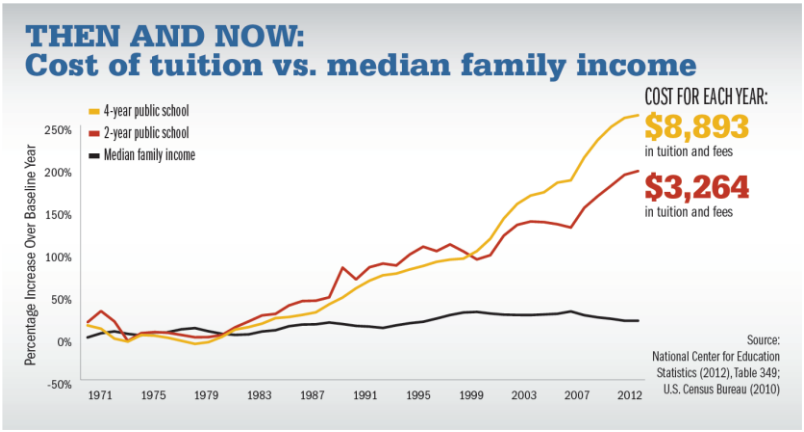

Figure 4. Cost of Tuition v. Median Family Income
Reprinted from Four-Year Myth: Make college more affordable. Restore the promise of graduating on time, Complete College America, 2014

In addition to the considerable increases to college tuition, taking longer to complete a bachelor's degree can result in taking additional credits not needed for the degree, known as excess credits. In 2009, Florida's Legislature passed SB 1696, which

instituted the Excess Credit Surcharge, charging students attending Florida's public universities double the current in-state tuition rate for credits taken over 120% of the credits required for their degree. The policy also states that courses that the student has failed or dropped, transfer courses that were part of an AA (despite degree applicability), and courses taken for a minor would count toward the excess credit count. On average, a bachelor's degree requires 120 credits, which means students would have 24 credits beyond the 120 for exploration and/or error (drop or fail courses).

Lastly, delays in graduation also delay the student's ability to earn money and therefore decreases lifetime earnings. According to a report published by Complete College American in 2014, Four-Year Myth, every additional year a student takes to complete a bachelor's degree is equal to $45,000 in lost wages (p.6). Moreover, each additional year of college can cost the student an average of $14,000. When adding the year of lost wages ($45,000), plus the cost of an additional year of college ($14,000) each year that a student delays their graduation, it will cost them $59,000. As a result, many policy makers have become concerned with the amount of time students take to complete their degree and the cost of attending college and attention has turned to graduation rates within a specific amount of time, specifically within four- and six-years.

Socioeconomic Status

Access to postsecondary education depends largely on family income and financial support. Many studies agree that underrepresented students are more likely to come from low socioeconomic families and have been gravely affected by tuition increases (Astin, 1993; O'Brien & Zudak, 1998; Ward, 2006; Boehmer & Webber, 2008). Although increases in tuition have affected students nationally, it has especially affected

underrepresented students. According to Zumeta, et al (2012) the increase in tuition cost, even after student aid is accounted for, is posing added challenges for underrepresented groups to gain access to higher education and successfully complete a degree. For low-income students, not receiving enough aid can lead to increased work hours and/or incurring credit card or student loan debt in order to meet the financial gap. Unfortunately, many of those same students drop out owing a lot of money and with no degree to help improve career opportunities (Bok, 2013). Furthermore, Bergerson (2009) states that the current tax funding model in the U.S. allows for students who live in a higher socioeconomic neighborhood to attend a "higher quality" school. The result of such tax funding model is that students from lower socioeconomic backgrounds have less probability to be prepared for and accepted to college.

College Preparedness

Socioeconomic status is not the only barrier underrepresented students face when trying to access a postsecondary education. As the demographics of students receiving a college education have changed over the years, so has the level of college readiness. According to Derek Bok (2013), many FTIC students are poorly prepared for college level work due to the deficiencies of the public school system in the U.S. (p. 78), yet getting high schools and colleges/universities to work together to better align the skills students learn in high school with those needed to succeed in college has been difficult. In addition, underrepresented students born outside of the U.S. may not have the same educational opportunities as underrepresented students born within the U.S. According to the National Center for Education Statistics (NCES), underrepresented students born in the U.S. enrolled in college at a higher rate than underrepresented students born outside

the U.S. (2012). The U.S. Census Bureau states 81% percent of minorities in the U.S. in 2014 were foreign-born (Colby & Ortman, 2015).

O'Brien and Zudak (1998) and Ward (2006) both believe underrepresented students have lower K-12 academic achievement and are less likely to pursue a university education than White students. They further argue that lack of language proficiency, immigrant status, lack of access to quality education because of low socioeconomic status, and cultural issues such as familial patterns hamper their prospect of accessing a college degree (Astin, 1993; O'Brien & Zudak, 1998; Ward, 2006). College readiness and academic preparation is a risk factor associated with college access and completion for underrepresented students. One of the biggest criticisms often heard regarding K-12 education is the lack of academic preparedness of its students once they graduate. Unfortunately, students are graduating from high school with very low competencies. As a result, it has affected the access and success of underrepresented students in higher education (Alon, 2011; Boehmer & Webber, 2008; Long & Riley, 2007). Only 16% of Hispanic high school graduates are academically prepared for a postsecondary education – the percentage is less for Blacks; consequently, 40 % of college students require at least one remedial course after high school (Boehmer & Webber, 2008; Goldrick-Rab & Cook, 2011; Long & Riley, 2007). The number increases when looking at students from low socioeconomic backgrounds. Sixty-three percent of students who come from low socio-economic backgrounds need remediation (Boehmer & Webber, 2008; Goldrick-Rab & Cook, 2011, p. 258). A report brought out by the American College Testing program (ACT) found "an achievement gap among students by race and ethnicity." The ACT, Inc. has set "college-readiness benchmarks" in four areas: English/language arts, math,

reading, and science. Only 13% of Hispanic students and 5% of African-American students hit all benchmarks (Adams, 2012).

Accelerated Credits

A student's curriculum in high school can determine how well-prepared they are to succeed in college. Exposing high school students to a rigorous curriculum increases the student's chances of being successful in college and can encourage them to complete a bachelor's degree (Cook, 2013). While in high school, some students have the opportunity to begin earning college credits, either through taking courses via a college or university (dual enrollment) or by taking Advanced Placement (AP) or International Baccalaureate (IB) courses at their high school, which require that students take and pass an exam in order to earn college credits. College credits the student earns while in high school are often referred to as accelerated credits due to their ability to "accelerate" a student's progress toward a postsecondary degree. These accelerated credit programs have three primary purposes: 1) introduce students to college level work and encourage college attendance, 2) ease the transition from high school to college, and 3) lower the cost and time of completing a college degree (Lin, Borden, & Chen, 2018). A study conducted by Geiser and Santelices (2004) found that participation in AP courses has a positive correlation to degree completion. A study conducted by Klopfenstein (2010), on the other hand, found no correlation between college completion and the completion of AP courses or passing the AP exam. The study, however, found that participation in dual enrollment programs have a positive effect on degree completion (Klopfenstein, 2010).

With college completion rates gaining the attention of policy makers, many states have implemented accelerated credit programs. In fact, in the last several years, efforts

have increased to expand these programs to provide equitable access to all high school students. In the last ten years, the number of students taking AP courses in the US has increased from 1.974 million in 2010-2011 to 2.643 million students in 2019-2020, a 33.9% increase (College Board, 2020). In addition, the number of AP exams taken during that same period increased from 3.456 million to 4.752 million, a 37.5% increase, indicating that some students are taking multiple AP courses in one academic year (College Board, 2020). Furthermore, the number of Hispanic students taking AP courses also increased between 2010-2011 and 2019-2020 from 441,647 to 960,743, an astonishing 117% increase in 10 years (College Board, 2020). Lastly, the number of Black students taking AP courses also increased from 211,871 to 256,686, an increase of 17.5 percent (College Board, 2020). In Florida, although the number of students taking AP courses increased between 2010-2011 and 2019-2020, the increase has been slower than at the national level (College Board, 2020). In ten years, the number of students taking AP courses in Florida increased from 306,898 to 373,471, an increase of 21.7%, while the number of Hispanic students in Florida taking AP courses increased from 71,595 to 126,496, a 73.6% increase (College Board, 2020). Most concerning, however, is the number of Black students taking AP courses, which decreased by 17.9% from 34,341 to 28,218 in 2019-2020 (College Board, 2020).

A longitudinal study conducted by the U.S. Department of Education on dual enrollment found that a higher percentage of White and Asian students took dual enrollment courses as compared to Hispanic and Black students (National Center for Education Statistics Data Point, 2019). Karp (2015) noted that dual enrollment participants have smoother transitions to college, higher high school graduation rates, and

higher likelihood of succeeding once in college, as compared to students who do not participate in dual enrollment programs. Hofmann (2012) also notes that dual enrollment programs assist with college completion efforts. Another study conducted in Colorado also found that students who participated in dual enrollment programs and matriculated at a postsecondary instution within one year of their high school graduation had higher college completion rates than students who did not participate in dual enrollment programs (Buckley, P., Pendergast, P., & Klopfenstein, K., 2020).

High School GPA and College Admissions Tests

When it comes to applying to college, high school GPA and college admission test scores have, for a very long time, been the two main qualifications that universities consider for admission. Studies by Astin (1993) and, more recently, Allensworth and Clark (2020) determined that high school GPA and college admissions test scores are powerful predictors of a students' academic performance in college, specifically their college GPA and completion. Although high school GPA and college admissions test scores have been found to be the strongest predictors of "success," namely a student's GPA in college, some studies have argued that they are not as strong in predicting college completion. Several studies have found that SAT and ACT scores were not significant in predicting whether a student graduated (Bowen, Chingos, & McPherson, 2009; Schuh, 1999).

Just as socioeconomic status and ethnicity impacts college enrollment, they too have a large impact on a student's performance on the SAT, an eligibility requirement for Florida's Bright Futures and an admissions requirement for all state universities in Florida. Performance on the SAT strongly correlates with race and family income,

leaving low-income, underrepresented students at a disadvantage (Nelson, 2015). Minority students may have language barriers, whereas, low-income students lack the means to pay for prep courses which often are expensive (Vasquez, 2013). Furthermore, Capilouto and Tracy (2017) found that students with more financial resources not only score better on the SAT and ACT, but also are more engaged academically.

Financial Aid

For years, financial aid programs have served as a recruitment and retention tool for colleges; however, for students it can determine whether or not they are able to afford pursuing a college degree. Several researchers have highlighted the importance of financial aid programs. Astin (1993) suggested that financial aid can have a powerful effect on student retention, while Wilcox (1991) highlighted that financial aid programs add value to an institution's recruitment efforts to attract a diverse group of students. In addition, other studies have found a positive correlation between financial aid and persistence, regardless of ethnic or income group (Hoffman, Vargas, J., & Santos, 2008; St. John, Paulsen, & Carter, 2005).

As discussed previously in this chapter, the cost of tuition has increased significantly in the last several years, which has caused some concerns about access for low-income students. To mitigate this concern, the federal government has established financial aid policies that make grants and loans more accessible to low-income families. In a study conducted by Goldrick-Rab and Cook (2011), students were asked what the most important factor was in their decision-making process when choosing a college or university. Forty-five percent stated that an offer of financial aid was a "very important" factor (Goldrick-Rab & Cook, 2011, p. 266). When making the choice to attend a

postsecondary institution, 80% of Black females and 72% of Black males stated that the availability of financial aid was an important factor. Similarly, 76% of Hispanic females and 65% of Hispanic males expressed the same. (National Center for Education Statistics, 2012). Additionally, studies conducted by Perna and Titus (2004) and Heller (2004) also found that financial aid and unmet need, the gap between a student's financial resources and the cost of attending college, is consistently related to college enrollment. Students from racial/ethnic minority groups rely more on aid because they receive fewer family contributions to pay for college (Elliot & Friedline, 2013).

Financial aid can come from several sources, including federal and state governments, institutions, and private entities. In addition, there are several types of financial aid, the most common being grants, scholarships, and loans. Grants are typically need-based funds, which are funds awarded based on financial need. Grant funds come from the federal or state government, do not need to be repaid, and are disbursed directly to the institution. Similar to grants, scholarships do not need to be repaid; however, unlike grants, they are typically merit-based, which are funds awarded based on the academic, athletic, or special interest achievements of the student. Scholarships are awarded through non-profit or private organizations, such as a business, religious organization, or college/university. Lastly, loans are funds borrowed by the student or their parents that are repaid and include interest. Loans can come from the federal government, financial institutions, or private organizations, and are often neither need- nor merit-based. The only exception is the subsidized loan, which is given to students who show financial need and do not accrue interest while the student is in school.

The research on the impact of financial aid on college completion is scarce, and several researchers point this out (Castleman & Long, 2016 & Long, 2013; Goldrick-Rab, S., Kelchen, Harris, & Benson, 2016; Denning, 2019); however, there is a lot of research analyzing the impact of financial aid on college enrollments and persistence, some of which will be reviewed in this section. Despite the small amount of research on financial aid and college completion, those studies on college enrollment and persistence are still relevant in the dicussion around college completion since in order to complete a degree, students must enroll and persist. With regard to financial aid and college completion, a study conducted by Denning (2019), analyzed financially dependent college students in Texas and found that when students received additional financial aid (federal, state, or institutional), they were 1.8 percentage points more likely to gradaute in six years. Another study by Castleman and Long (2016) analyzing Florida students eligible for the Florida Student Access Grant, which will be discussed later in this section, found that eligibility for FSAG increased the probability of earning a bachelor's degree within 6 years by 3.5 percentage points. Lastly, a study conducted by Goldrick-Rab, S., Kelchen, Harris, & Benson (2016) analyzed students who received the Wisconsin Scholars Grant, a private, need-based grant, and found students who were offered the grant had increases in four-year graduation rates.

Need- v. Merit-based Aid

Historically, federal and state governments have invested in need-based scholarships as a way to increase access to a postsecondary education. According to Castleman and Long (2013), students who received need-based aid were more likely to attend and complete a four-year university; however, although the federal government

still invests a large amount of funds in need-based aid through the Pell Grant, many states have shifted from need-based aid to merit-based aid. At the national level, funds for need-based financial aid increased by 47% from 1995-1996 to 2003-2004, while merit-based aid increased 212% during that same period (Farrell, 2004; Heller, 2004; Monks, 2009). Following the national trend to increase merit aid, Florida awards less need-based aid than most states. In 1990-1991, 40% of Florida's grant support for students was need-based and in 2009-2010, it fell to only 25% (RISEP, 2012). Furthermore, only 16% of Pell Grant recipients in the state receive supplemental aid from the state (McKinney, 2009).

More than half of states in the U.S. have implemented merit-based scholarship programs, with Georgia's HOPE scholarship leading the way on this initiative (Erwin & Binder, 2020). Like need-based aid, merit-based aid has been found to have a positive correlation to college enrollment (Monks, 2009). However, a study conducted by St. John et al. (2004), found that need-based aid had a more significant effect on the college enrollment rates of high school graduates than did merit-based aid. While underrepresented students are more likely to receive need-based aid, studies have found that white students receive a disproportionate share of merit-based aid (Heller D., 2006). Correspondingly, the decrease in need-based aid funding and the increase in merit-based aid funding results in White students benefiting more from the current aid system. Two reports published by the Civil Rights Project at Harvard University agree that the students least likely to be awarded a merit scholarship tend to be underrepresented and low-income students (Cornwell & Mustard, 2004). As a result, merit-scholarship programs are a threat to increasing college access among underrepresented and low-income students,

especially if states continue to support merit-based programs, which overshadow need-based programs (Ness & Tucker, 2008; Heller, 2006). The disproportionate eligibility rates of underrepresented students suggest that merit aid is an inefficient policy for increasing access.

Federal Aid

The development of the financial aid system was originally to assist low-income families with offsetting the cost of attending a postsecondary institution. With the establishment of the Higher Education Act of 1965, signed by President Lyndon Johnson, the US federal government became the primary provider of financial aid in an effort to provide equal opportunity to attend college to everyone (Mumper, Gladieux, King, & Corrigan, 2011). "In the nineteenth century the states served as intermediaries in federal support for higher education, but toward the beginning of the twentieth century, federal support increasingly bypassed the states and went directly to institutions" (Mumper, Gladieux, King, & Corrigan, 2011, p. 117). The federal government provides three types of student aid: grants, loans, and work study, and provides over $150 billion in financial aid every year. Their largest grant program, the Pell Grant, provides financial support for undergraduate students with financial need (U. S. Department of Education, 2021). In addition, they offer four types of loans: subsidized, unsubsidized, Direct PLUS, and Federal Perkins.

Pell Grant

At the centerpiece of the federal financial aid system is the Pell Grant. In 1971, Senator Claiborne Pell introduced a bill in an effort to make the cost of attending college more affordable by subsidizing it (Goldrick-Rab, 2016). In 1972, congress approved the

bill, creating the Pell Grant, which is now one of the most common types of aid provided by the federal government and is awarded based on financial-need (Goldrick-Rab, 2016). To be eligible for a Pell Grant, applicants must: demonstrate financial need, be a US citizen or eligible noncitizen and have a valid social security number, have completed the Free Application for Federal Student Aid (FAFSA), show qualifications to obtain a college degree (high school diploma or GED), be enrolled or accepted for enrollment in a degree or certificate program, and be enrolled at least half-time.

At the time of its creation, the Pell grant funded all the costs of attending a community college and more than 80% of the average public university; however, nowadays with high tuition costs, and lower amounts given to Pell Grant recipients, low-income families are left with tuition costs they cannot manage (Goldrick-Rab & Cook, 2011, p.5). More recently, the number of Pell Grant recipients has tripled. The number of undergraduates receiving Pell Grant rose from 25% in 2007 to 32% in 2017 (Baum, Ma, Pender, & Libassi, 2018). In 2015-2016, 36.2% of undergraduate students received the Pell Grant – in Florida it was 44.2%. Distribution by demographics in US for 2015-2016 was 42.4% white, 22.7% Black, 24.2 Hispanic (U.S. Department of Education, 2019). According to Baum, et al. (2018), students from families earning a minimum of $75,000 and who attended institutions with tuition and fees below $25,000, received more institutional aid than those from families with lower incomes. Moreover, even the Pell Grant has experienced some changes that affect low-income students. Prior to 1992, home equity was a consideration when awarding Pell Grants; however, currently, home equity is excluded from the calculations, therefore, qualifying more middle-class families for federal need-based support (Long & Riley, 2007).

A study conducted by Ishitani (2020) on Pell Grant recipients who attended public and private four-year institutions found that Pell Grant recipients had lower graduation rates than their non-Pell peers; however, Pell recipients attending larger institutions had higher graduation rates that those attending smaller institutions. Another very recent study by Eng and Matsudaira (2021), analyzed the data for students entering college between 2002 and 2010 and receving aid under Title IV of the Higher Education Act. Although they found a positive effect on the probability of Pell recipients completing a degree, they also mention that they have reason to believe that the effect Pell may vary across states and institutions (Eng & Matsudaira, 2021).

Student Loans

The federal student loan program is run through the U.S. Department of Education and offers four different types of loans. The two more well-known types are: subsidized and unsubsidized. Subsidized loans are loans in which the government pays the interest while the student is attending school. The amount of the loan (minus the interest paid by the government) must be repaid once the student graduates or ceases to enroll at a University. Unlike subsidized loans, unsubsidized loans accrue interest from the date they are disbursed and the student is responsible for paying the accrued interest, as well as the amount of the loan.

According to the U.S. Department of Education website on federal student loans, the federal government owns 92% of student loan debt, while the rest is owned by private financial institutions. Student loan debt is currently at its highest, with over 42 million students owing over $1.5 trillion in student loans. According to the Federal Student Aid Portfolio data from the Federal Student Aid website, the four states with the largest of

amounts of student loan debt are California, Texas, Florida, and New York, which are also the most populous states in the US, but also the ones with the largest Hispanic populations. Collectively, these four states account for over a quarter of student loan debt in the U.S. Florida accounts for 6% of the total student loan debt in the country, with 2.5 million students owing over $95 billion. Linsenmeier, Rosen, and Rouse (2006), conducted a study that compared loans and grants (federal, state, and institutional combined) and their effects on college enrollment and found that grants have a strong positive effect on college enrollment, while loans had little to no effect.

State Aid

While federal financial aid support remains steady, many states have shifted their financial aid priorities from need-based aid to merit-based aid. According to Long & Riley (2007), aid priorities have shifted in the last 15 years. Rather than increasing the access of low-income students, they have focused on the affordability concerns of middle- and upper-class families, a shift that mainly affected underrepresented student access (Elliot & Friedline, 2013; Long & Riley, 2007). As a result of the focus toward merit-based aid, a large portion of financial aid has been pulled away from students with the greatest need. States with merit-based programs use different funding sources to award the scholarships; however, 8 states have lottery funded programs: Arkansas, Florida, Georgia, Kentucky, New Mexico, South Carolina, Tennessee, and West Virginia (Lebioda, 2014). In states that funded merit-based scholarships using lottery funds, it is estimated that approximately $1 billion was awarded based on merit, while approximately $300 million was awarded based on need (Lebioda, 2014; Ness & Tucker, 2008). However, lottery funding can be unpredictable and as more students qualify for

scholarships and tuition increases, keeping up with funding required to support merit-based programs becomes a challenge, often forcing states to increase eligibility requirements, while decreasing the amount awarded. “Social constraints, economic barriers and cultural differences have prevented many students from pursuing or persisting in higher education (Paulson and St. John 2002; Braxton 2000; Walpole 2003); and these restraints appear to be greater impediments when coupled with nontraditional backgrounds” (Weidman 1985; Pusser et al. 2007).

Research shows that underrepresented students rely on aid when making decisions about college, yet they are at a disadvantage when qualifying for merit-based scholarships. With merit-based scholarship programs taking the reins over need-based programs in many states, including Florida, and performance-based funding models placing emphasis on retention and graduation rates, as well as excess credit hours, it is important to analyze the performance of merit-based scholarship recipients as it relates to the metrics. In addition, according to Paulsen and Toutkoushian (2008) “the goal of educational policies is to lead to desired changes in behavior for participants within the education system” (p. 1). If the goal of the state is to increase retention and graduation rates, then recipients of merit-based programs funded by the state, in theory, should be meeting these same objectives.

Two studies looked at state financial aid specifically, and their impact on college enrollment. Kane (2003), in a study that analyzed the Cal Grant program, and Heller (1999), in a study that looked at financial aid and enrollment data from public institutions in all 50 states, also found a positive relationship between grants and enrollments. Heller’s study, in particular, found that enrollments declined in states with decreased

grant spending, with underrepresented groups responding more to those decreases in grant spending (Heller, 1999).

Bright Futures Scholarship Program

Florida's need-based grant support for students has steadily declined over the last several years (RISEP, 2012). In 1997, Florida implemented the Bright Futures Scholarship Program, funded by lottery revenues. Modeled after Georgia's HOPE Scholarship Program, Bright Futures was created to reward high school graduates who merit recognition of high academic achievement (Florida Department of Education, 2015). The program awards grants to offset the price of tuition and fees at in-state institutions to students who apply during the senior year of high school and meet the academic requirement (Perna, et al., 2010). Unlike Georgia's HOPE Scholarship, which only considers GPA and academic rigor of high school courses for eligibility, the Bright Futures Program requirements consist of minimum GPA, SAT/ACT scores, and completion of minimum number of service hours. It offers two levels of awards: the Florida Academic Scholars (FAS) and the Florida Medallion Scholars (FMS). The FAS award is the higher level of the two, requiring a 3.5 weighted high school GPA, an SAT or ACT score of 1330/29, respectively, and 100 service hours. The FMS award requires a 3.0 weighted high school GPA, an SAT or ACT score of 1210/25, respectively, and 75 service hours.

Although a great opportunity for students, some critics argue that the Bright Futures program disproportionately benefits high school graduates who are White or Asian rather than Hispanic or Black (Perna, et al., 2010). According to the Florida Bright Futures Scholarship Statistical Reports on the Florida Department of Education's

(FLDOE) Office of Student Assistance website, of the students who received Bright Futures in 2019-2020, only 26% were Hispanic and 6% were Black, while 56% were White and 8% were Asian. In comparison, only 44% of students enrolled in the State University System in fall 2019 were White, 5% were Asian, 29% Hispanic, and 13% Black (see Table 1). Furthermore, when looking at the percent of students who receive Bright Futures compared to the percent of students who receive Pell Grants by institution, the institutions whose enrollments are comprised primarily of underrepresented students are also the two institutions with the lowest percentages of Bright Futures recipients and the highest percentages of Pell Grant recipients (see Table 3).

Table 3

Comparison of Pell Grant Recipients to Bright Futures Recipients, Fall 2015

Institution	% Bright Futures Recipients	% Pell Recipients
State University System	33.6%	39.0%
Florida Atlantic University	15.4%	41.8%
Florida A&M University	8.5%	65.4%
Florida Gulf Coast University	21.8%	31.9%
Florida International University	14.9%	51.4%
Florida Polytechnic University	41.0%	N/A
Florida State University	52.4%	27.7%
New College of Florida	66.8%	28.3%
University of Central Florida	33.4%	39.8%
University of Florida	70.2%	29.7%
University of North Florida	26.9%	32.1%
University of South Florida	31.0%	41.2%
University of West Florida	18.1%	41.3%

Source: FLDOE, End-of-Year Report and FLBOG, SUS Florida Accountability Report, 2015-2016

In 2012, the Florida legislature began to gradually increase SAT/ACT requirements to qualify for the Bright Futures scholarship, while leaving the GPA requirement untouched. Under the new Bright Futures requirements, it was expected that there would be a significant decrease of underrepresented students who qualified for the

program. More than 60% of Hispanics and 75% of African-Americans who would have qualified under the old requirements would not qualify under the new requirements (Vazquez, 2013). A legislatively-appointed panel reported that of the 63,000 students across the state who received Bright Futures scholarships in 2000, only 29% had financial need. Conversely, 78% of students who were not eligible for the Bright Futures scholarships had financial need during that same year (Heller, 2004). Although between 2011 and 2017 the number of students who qualified for Bright Futures under the new requirements significantly declined by as much as 16% in 2014 as compared to the previous year, the State began to experience an increase in 2018 where the number of students who qualified increased by 8% from the previous year (Florida Department of Education, 2021).

The largest school district in the State of Florida is Miami-Dade County Public Schools. Not only does Miami-Dade County graduate the largest number of high school students, but it is also the school district with the highest number of underrepresented students and people under 18 who live in poverty. Coincidently, in 2002, only 20.2% of high school graduates in Miami-Dade County were eligible for Bright Futures (Farrell, 2004). When analyzing students who qualified for Bright Futures in 2002 in Miami-Dade County, it is evident that the ethnically diverse community did not fare as well as others. Of Florida's 2002 high school graduates, 7.6% were Hispanic from Miami-Dade County; however, only 4.4% of Bright Futures Scholarship recipients are Hispanic from Miami-Dade County. In contrast, 2.3% of Miami-Dade's high school graduating class was White; however, 2.5% of Bright Futures Scholarship recipients are White students who graduate from Miami-Dade County" (Farrell, 2004). Statewide, over 75% of the eligible

Bright Futures Scholarship recipients were White, while 60.1% of high school graduates were White. The rates for the eligibility of Bright Futures among Black and Hispanic graduates were drastically lower. Over a period of four years, Black students averaged 20.7% of Florida's high school graduates; however, they only represented 8.5% of eligible Bright Futures recipients. In contrast, Hispanic students averaged 16.1% of Florida's high school graduates and only 10.8% of eligible Bright Futures recipients (Farrell, 2004).

Florida Student Assistance Grant Program

Despite most of Florida's aid funds going toward merit-aid, there are funds that are earmarked for need-based aid programs. One such program is the Florida State Assistance Grant (FSAG) which was established to provide students with demonstrated financial need additional financial assistance to attend one of the State's universities, colleges, or career centers. The program offers four different grants, each pertaining to attendance at a different type of school: public, non-profit private, for-profit private, and career centers operated by district school boards, with each awarding a minimum of $200 annually to students (Florida Department of Education, 2021). The maximum annual award of the FSAG is determined by the state legislature each year.

Eligibility criteria for the FSAG includes Florida residency, no prior earned bachelor degree, enrollment in a minimum of 6 credits, and demonstrating financial need (Florida Department of Education, 2021). Students who are eligible must also complete the FAFSA and apply for the Pell Grant. Castleman and Long (2016) conducted a study on college access, persistence, and completion for students who entered college in 2000

and received the FSAG. They found that FSAG eligibility increased the probability of earning a bachelor's degree within 6 years by 3.5 percentage points.

Table 4 outlines the number of students with Pell, Bright Futures, and FSAG at each four-year, public institution in Florida, while Table 5 highlights the total distributed in FSAG and BF funds during the 2019-2020 academic year. These tables demonstrate that the large majority of Florida's state aid monies that are going to students attending a public college or universities are directed toward merit aid, specifically the Bright Futures program.

Table 4

Number of students with Pell, Bright Futures, and FSAG in 2017-2018.

Institution Name	Students with Pell	Students with Bright Futures	Students with FSAG
Florida A&M University	5,543	433	1,162
Florida Atlantic University	11,143	2,604	4,935
Florida Gulf Coast University	4,627	2,097	2,549
Florida International University	23,352	4,476	17,968
Florida Polytechnic University	434	606	344
Florida State University	10,278	15,319	5,980
New College of Florida	275	477	180
University of Central Florida	25,553	14,891	17,358
University of Florida	11,328	23,458	6,994
University of North Florida	4,783	2,866	3,266
University of South Florida	16,235	8,908	9,549
University of West Florida	4,055	1,393	2,423

Data from the Office of Student Financial Assistance, Florida Student Scholarship & Grant Programs, 2017-2018 End-of-Year Reports (https://www.floridastudentfinancialaidsg.org/SAPSPEOYR/SAPSPEOYR) and U.S. Department of Education Distribution of Federal Pell Grant Program Funds by Institution (https://www2.ed.gov/finaid/prof/resources/data/pell-institution.html)

Table 5

Need- v. Merit-based Funds Disbursed to Florida's SUS by Race/Ethnicity

	Need-based	% of Need-based Funds	Merit-based	% of Merit-based Funds
Florida A&M University	$2,731,520	2.2%	$2,586,723	0.5%
Florida Atlantic University	$11,413,659	9.3%	$18,556,175	3.5%
Florida Gulf Coast University	$4,635,645	3.8%	$12,492,279	2.3%
Florida International University	$24,205,447	19.8%	$39,496,070	7.4%
Florida Polytechnic University	$424,325	0.3%	$2,672,907	0.5%
Florida State University	$13,364,466	10.9%	$105,460,814	19.7%
New College of Florida	$212,966	0.2%	$2,353,152	0.4%
University of Central Florida	$21,884,763	17.9%	$103,781,696	19.3%
University of Florida	$15,018,971	12.3%	$158,963,500	29.6%
University of North Florida	$6,834,044	5.6%	$19,398,181	3.6%
University of South Florida	$17,757,001	14.5%	$62,340,455	11.6%
University of West Florida	$3,805,300	3.1%	$8,561,234	1.6%
White	$74,770,655	31.8%	$340,021,962	55.0%
Hispanic	$67,414,693	28.6%	$165,796,818	26.8%
Black	$51,454,694	21.9%	$36,536,147	5.9%
Asian	$21,080,860	9.0%	$52,552,435	8.5%
Other	$20,602,881	8.8%	$23,699,803	3.8%

Data from the Office of Student Financial Assistance, Florida Student Scholarship & Grant Programs, 2019-2020 End-of-Year Reports. *https://www.floridastudentfinancialaidsg.org/SAPSPEOYR/SAPSPEOYR*

Summary

The review of the literature conducted for this study provided important context and background regarding underrepresented students, specifically Hispanic students, and the barriers they face regarding to college access and completion. In addition, it provided useful information and justification for the use of the three groups of variables selected for this study, demographic, academic, and financial. With regard to demographic data, some studies highlighted the differences in the academic success of students by race/ethnicity, while others attributed some of the achievement gap to the schools attended by these students. A portion of the literature reviewed in this study highlighted the racial inequities present in the American education system. Four studies in particular highlighted the achievement gaps of underrepresented and low-income students and found that these gaps were due in part to the types of school they attended (O'Brien & Zudak, 1998; Kao & Thompson, 2003; Steifel, Schwartz, & Ellen, 2006; Ward, 2006). Other studies focused on the high percentage of underrepresented and low-income students leaving high school who needed remedial courses (Long & Riley, 2007; Boehmer & Webber, 2008; Goldrick-Rab & Cook, 2011).

Academic preparation was the focus of several other studies included in this chapter. Studies conducted by Karp (2015) and Hoffman (2012) noted that students who participated in dual enrollments programs had smoother transitions to college and higher completion rates. A similar study conducted by Geiser and Santelices (2004) found that students who took AP courses also had a positive correlation to college completion. In contrast, Klopfenstein (2010) found no correlation between taking AP courses and college completion. In addition, several studies noted the strong link between high school

GPA, SAT/ACT, and college completion (Astin, 1993; Allensworth and Clark, 2020); while others found that SAT/ACT has no correlation to college completion (Schuh, 1999; Bowen, et al., 2009).

Lastly, some of the literature on financial aid focused on its effect on college enrollments, while a select few focused on its effects on completion. Studies conducted by Perna and Titus (2004) and Heller (2004) found a link between financial aid and enrollment in college. Studies conducted by Denning (2019), Castleman and Long (2016), and Goldrick-Rab, et al. (2016) all found positive correlations between receiving financial aid and completion. One study, however, found that financial aid recipients, specifically Pell Grant recipients, had lower graduation rates than non-Pell recipients (Ishitani, 2020).

CHAPTER III

METHODOLOGY

As mentioned in Chapter I, this study focused on analyzing the four- and six-year graduation rates of seven FTIC cohorts at Florida International University. Information obtained from the University's student records system was utilized to investigate the effect of demographic, academic, and financial variables on the four- and six-year graduation rates of FTIC students. Demographic variables included race/ethnicity, gender, and status of the following: residency, first-generation, on-campus housing, and international. Academic variables included type of high school attended, weighted high school GPA, standardized test scores, accelerated credits (i.e., dual enrollment and test credits), retention status, and cumulative FIU GPA. Lastly, financial variables included the status of federal, state, and institutional aid, as well as estimated family income (EFC). The student's cohort year (i.e., admission year) was used as a control variable in these analyses.

This chapter outlines the research design, including the sample population, dependent and independent variables, and the data collection procedures. This study aimed to answer ten questions regarding what affects a student's graduation: 1) Do demographic, academic, and financial factors significantly help predict whether first-time-in-college students graduate in four years?; 2) Do demographic, academic, and financial factors significantly help predict whether first-time-in-college students graduate in six years?; 3) Do demographic factors better predict four-year graduation for first-time-in-college students than academic and financial factors?; 4) Do academic factors better predict four-year graduation for first-time-in-college students than demographic

and financial factors?; 5) Do financial factors better predict four-year graduation for first-time-in-college students than demographic and academic factors?; 6) Do demographic factors better predict six-year graduation for first-time-in-college students than academic and financial factors?; 7) Do academic factors better predict six-year graduation for first-time-in-college students than demographic and financial factors?; 8) Do financial factors better predict six-year graduation for first-time-in-college students than demographic and academic factors?; 9) Did the independent variables that were significant in predicting four-year graduation rates change over time?; 10) Did the independent variables that were significant in predicting six-year graduation rates change over time?

The study had two binary dependent variables (four- and six-year graduation) and various categorical and continuous variables divided into three categories: demographic, academic, and financial. Categorical variables were dummy-coded as needed and in accordance with best practice, as articulated by Mertler and Vannatta Reinhart (2016). While the independent variables were categorized into three categories, each variable was also analyzed separately in order to determine if a significant correlation existed between the variable and graduation.

Research Design

This study proposed the use of a quantitative correlational design. A quantitative method was selected for use in this study as opposed to a qualitative or mixed-methods one as hypothesis testing is proposed, which requires a quantitative method incorporating inferential statistical tests that produce a probability value (Edmonds & Kennedy, 2016). This calculated probability value was then compared with the alpha level selected for this study of .05 to determine whether the associated hypothesis was rejected or not rejected.

This study also incorporated a correlational design, as the focus of the study was on the association between a group on independent and dependent variables, and did not, for example, attempt to determine causality, which would require a causal-comparative design (Edmonds & Kennedy, 2016). In addition, an experimental design was not selected for use in this study as the researcher had no ability to manipulate the levels of these variables, while a quasi-experimental design was not thought to be appropriate, as this study did not examine any intervention or treatment (Edmonds & Kennedy, 2016).

A logistic regression model was used in this study. The logistic regression model is an approach that can be used to analyze the relationship between an independent variable and various dichotomous dependent variables. Figure 5 represents the use of the logistic regression model where X represents the independent variables and Y represents the dependent variable. The statistics examined in this study were the -2 Log Likelihood, full model Chi-Square, Wald statistic, and Negelkerke R^2. The -2 Log Likelihood measures how well the model fits and how much unexplained variation there is in the model (Howell, 2013). The higher the value of the -2 Log Likelihood statistic, the less accurate the model is, with 0 indicating a perfect model (Howell, 2013). The Wald statistic was used to measure the significance of each independent variable, while the Negelkerke R^2 was used to explain the proportion of variance accounted for by each of the models.

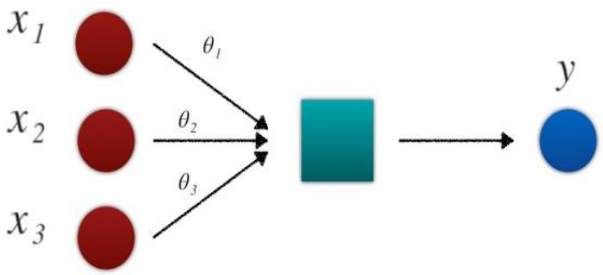

Figure 5. Logistic regression: The relationship between independent and dependent variables. Retrieved October 20, 2018, from https://towardsdatascience.com/machine-learning-part-3-logistics-regression-9d890928680f.

The binary outcome indicators of four- and six-year graduation required the utilization of logistic regression to describe the relationship between the dependent variables and the independent variables.

Dependent Variables

This study examined two dichotomous dependent variables: four-year graduation and six-year graduation. In the State of Florida, a student is considered to have graduated in four years if they graduate by the fourth summer after entry and in six years if they graduate by the sixth summer after entry. Table 6 below shows the graduation deadline for each cohort analyzed in the four- and six-year graduation rate study.

Table 6

Four- and Six-year Graduation Deadlines per Cohort

Cohort	Four-Year Graduation Deadline	Six-Year Graduation Deadline
2010	Summer 2014	Summer 2016
2011	Summer 2015	Summer 2017
2012	Summer 2016	Summer 2018
2013	Summer 2017	Summer 2019
2014	Summer 2018	Summer 2020
2015	Summer 2019	N/A
2016	Summer 2020	N/A

Independent Variables

This study analyzed several independent variables categorized into three areas: demographic, academic, and financial. The demographic category included six independent variables that identify students as part of a specific group. Those variables included race/ethnicity, gender, residency status, international student status, first-generation status, and on-campus housing status. The academic category included eight independent variables related to the student's academic history. Academic variables included type of high school attended, weighted high school GPA, accelerated test credits, dual enrollment, retention outcome, FIU cumulative GPA, and SAT scores separated into two sub scores: Math and English, Reading and Writing (ERW). Lastly, the financial category included six variables related to financial assistance, specifically type of aid received during the student's first year at the University. Those variables included federal aid, state aid, institutional aid, other aid, aid in general, loans, and Estimated Family Contribution (EFC).

Demographic:

- Race/Ethnicity: This is reported as a single measure and was taken from the student's admission application. Race/ethnicity is self-reported by the student. For the purpose of this study, race/ethnicity was organized into five categories: White, Hispanic, Black, Asian, and Other. For the purposes of this study, Hispanic was used as the reference category.
- Gender: Reported as Male or Female, this information was collected from self-reported information submitted on the admission application.

- Florida Residency Status: This status is a designation used by the University for tuition purposes. The University's admission application includes a residency classification section that students are required to complete. If additional information is required to prove Florida Residency, students submit an additional residency form and/or documentation.
- International Student Status: This is a dichotomous variable indicating if a student is an international student.
- First-Generation Status: First-Generation is defined as a student whose parents did not complete a four-year university degree. This is a dichotomous variable indicating whether or not the student is a first-generation student.
- On-Campus Housing Status: This dichotomous variable indicates if a student lived in on-campus housing during their first year at FIU.

Academic:

- Type of High School Attended: Information regarding high school attended is self-reported by the student on their admission application, but also collected via official transcripts submitted. The information used in this study was collected by the University from information provided on the official high school transcript and categorized as private, public, or other. The "other" category includes students who attended high school internationally or were home schooled. In this study, Public was used as the reference category.
- Retention Outcome: A dichotomous variable indicating if the student was retained from their first to second year. Retained students are students who enrolled during the first and second fall semesters after admission.

- Accelerated Test Credits: Accelerated test credits are credits earned prior to admission into the University. They are typically earned via Advanced Placement (AP) and/or International Baccalaureate (IB) programs where students take a cumulative test at the end of the school year to earn college credits based on their score on the test. Test credit data are collected from official score reports submitted to the University from test administrators, such as College Board.
- Dual enrollment: Dual enrollment credits are earned when students enroll for college credit courses at a local college or university via their high school. These courses can be taken at the high school, online, or at the college or university offering the course. The University collects data on dual enrollment credits from official transcripts submitted by the institution awarding the credits.
- Final Weighted High School GPA: A student's weighted GPA will add extra points for Honors or Advanced Placement courses. Information regarding weighted GPA is collected from the student's official high school transcript. Weighted high school GPA is used for admission purposes; therefore, it was included in this analysis as opposed to unweighted high school GPA.
- Cumulative FIU GPA: Cumulative FIU GPA is the student's GPA after their last semester of enrollment at FIU. FIU GPA data is stored in PeopleSoft, the student records system used by the University.
- SAT Scores: The Scholastic Achievement Test (SAT) is a college entrance exam administered via College Board. There are three scores reported for the

SAT: Total score, Math section, and ERW section. The total score is a composite score, which is the sum of the math and ERW sections. SAT scores are collected by the University via an official score report submitted by the College Board. In addition to SAT scores, this variable also included scores for the American College Test (ACT) administered by an organization of the same name. The exam, like the SAT, is a college entrance exam that tests four academic areas: math, reading, English, and scientific reasoning. Scores are reported as a total score, as well as by subject area and are collected by official score reports submitted by ACT. ACT scores were converted into SAT scores using concordance tables available on the College Board, Inc. website.

Financial:

- Federal Aid: This is aid provided to the student by the federal government. This aid includes the Pell Grant, as well as subsidized and unsubsidized loans, such as the Stafford loan. The Pell Grant, a need-based program, does not have to be repaid by the student. This variable is dichotomous and indicates if the student received the Pell Grant or a loan during their first year at FIU.
- State Aid: In the State of Florida, the most common type of aid is the Bright Futures Scholarship, a merit-based scholarship awarded to students who earn a certain GPA, SAT and/or ACT score, and complete 100 hours of community service during their high school years. The Bright Futures Scholarship covers between 75 and 100% of tuition at a State institution (college or university)

depending on qualifications. This variable is dichotomous and indicates if the student received the Bright Futures Scholarship during their first year at FIU.

- Institutional Aid: At FIU, students are awarded specific institutional scholarships and grants based on qualifications or need. Some scholarships, such as the Blue and Gold Scholarship, are awarded at the time of admission, while others, such as the completion grant, are awarded based on need toward the end of the student's college career. This dichotomous variable indicates if the student received any institutional aid during their time at FIU.
- Loans: Students loans can come from different sources, including federal and state governments, as well as private banks. This variable is dichotomous and only indicates if the student received a loan, not the amount.
- Financial Aid: Financial assistance can come from many sources and includes scholarships, grants, and loans. This variable is dichotomous and only indicates if the student received financial aid of any kind during their first year.
- Expected Family Contribution Range: Expected Family Contribution (EFC) is, as the name suggests, the amount a student's family and the individual are expected to contribute toward a year of college. EFC is used by the Office of Financial Aid to estimate how much financial aid a student should receive. EFC is calculated using information provided on the FAFSA and is typically a continuous variable; however, for the purpose of this study, EFC was placed into ranges, as used by FIU. A category for "No EFC Reported" was also

included since that information is also important, as those students did not complete a FAFSA. The ranges are as follows:

- $0 – Students in this range qualify for the highest amount of aid
- $1-$1,000
- $1,001-$3,000
- $3,001-$5,576 ($5,576 is the end of Pell eligibility)
- $5,577-$8,600 ($8,600 is the end of need-based grant eligibility)
- $8601+
- No EFC Reported (Used as reference category)

Sample population

The students selected for this study were students admitted as first-time-in-college students at Florida International University, a large, public, urban, Hispanic-Serving Institution in Miami, Florida. All students were admitted in the summer or fall of 2010 through 2016. First-time-in-college students are students admitted into the university right out of high school, regardless of college credits earned prior to their admission. Florida International University enrolls over 55,000 undergraduate and graduate students, with approximately 70% of its enrollment coming from undergraduate students and 30% from graduate students; specifically, 33% of the total enrollment comes from FTIC students, which are part of the undergraduate population. In addition, over 90% of students enrolled at FIU are residents of Florida as classified by their residency status.

For this study, gender and race/ethnicity were gathered for each student, as self-reported on their admission application. Table 7 below provides information on gender and race/ethnicity. Similarly, 94% of students in this sample were residents of the state.

In reviewing the percentage of students classified as in-state, it can be determined that the majority of students at the University and in the sample used for this study attended high schools in the State of Florida. With regard to first-generation status, 16% of the University's enrollment comes from first-generation students, while in the sample population, this was 20%. Interesting to note is that none of the out-of-state students at the University were classified as first-generation, leading me to believe that first-generation students tend to stay close to home. Table 7 below provides information on the sample population.

Table 7

Institution and Sample Population Demographics, Fall 2019

	Institution*	Sample Population
Female	57%	55%
Male	43%	45%
Hispanic	61%	69%
White	15%	9%
Black	13%	11%
Asian	4%	3%
Other	7%	8%
In-State	88%	94%
Out-of-State	12%	6%
First-Generation	16%	20%
International Students	8%	6%
On-Campus Housing	6%	22%

**Institution numbers retrieved from https://www.fiu.edu/about/index.html*

Data Sources

FIU's Office of Analysis and Information Management (AIM) provided the data collected for this study. AIM gathered the data for this study from the University's student academic information system, PeopleSoft, which houses all academic records for students. The data included information for FTIC students admitted and enrolled at FIU

from the summer of 2010 through fall of 2016, the latest cohorts for which graduation information was available. A cohort year will include FTIC students admitted in summer and fall of that year; for example, the 2010 FTIC cohort includes students admitted in summer and fall of 2010. Although FTIC students are also admitted in the spring semester, that group is typically small compared to those admitted in summer and fall. In addition, when calculating graduation rates, the University only considers FTIC admitted in summer and fall.

There were seven cohorts analyzed in this study. All seven cohorts were utilized in the analysis using four-year graduation rates; however, since six-year graduation information was only available for five of those cohorts, only five cohorts were utilized in the analysis using six-year graduation rates. The five cohorts used for the six-year graduation analysis were 2010, 2011, 2012, 2013, and 2014. Data were provided for a total of 30,179 students, as follows: 2010 cohort (n=3,943), 2011 cohort (n=4,477), 2012 cohort (n=4,350), 2013 cohort (n=4,525), 2014 cohort (n=4,144), 2015 cohort (n=4,206), and 2016 cohort (n=4,534). The six-year graduation analysis included 21,439 students, while the four-year graduation analysis included all 30,179.

Procedure

No personal identifying information, such as name and identification number, was collected; however, the following information was collected for each student: demographic information, financial aid information, and academic information (see Table 8). The University collects data from students in several ways, including, but not limited to, the admission application, FAFSA, and documents submitted by the student, such as high school transcripts. As data is collected, information is stored in PeopleSoft, the

University's record management system. The section below describes the procedures used by the University to collect information for each of the variables used in this study.

Some demographic information was collected from the student's self-reported information on the admission application. It included race/ethnicity, gender, and first-generation information. First-generation status is determined by the University based on information provided by the student on their parents' education history, whereas the student selects race/ethnicity and gender from a list of options. Race and ethnicity data were collected as a single measure at the institution from where the sample population was pulled. Although residency status is also a self-reported component of the admissions application, the University requires proof of residency for students who self-identify as a Florida resident on their admission application. This requires students to submit documentation that proves they are a resident. Documentation may include, but is not limited to, vehicle and/or voter registration. International student status, although also reported on the admission application, also requires further documentation, such as visa information. Lastly, on-campus housing status is provided by the FIU's Office of Housing and Residential Life and kept in PeopleSoft.

Academic information, like the demographic information, is housed in PeopleSoft, although is it collected from a variety of sources. Type of high school and high school GPA (weighted and unweighted) are taken from the student's official transcript provided by the student's high school. SAT, ACT and accelerated test credits are collected via official score reports provided by the test administrator, such as the College Board. Dual enrollment credits are collected from official transcripts received from the institution where the dual enrollment credits were taken. Lastly, cohort year,

retention outcome and cumulative FIU GPA are collected from the student's admission and enrollment records stored in PeopleSoft.

With regard to SAT and ACT test scores, a significant number of students reported scores to the University for both the SAT and ACT, as well as scores for multiple attempts in one or both of the exams. In addition, the SAT implemented changes to the exam in March 2016, which changed it from a three-section exam using a 2400-point scale to a two-section exam using a 1600-point scale. Since this study analyzed cohorts from 2010-2016, there were students with SAT scores using both the old and new point-scale. As a result, several steps were taken to simplify both the SAT and ACT scores. First, using concordance tables provided by College Board, old SAT scores using the 2400-point scale (total score and each subsection) were converted into new SAT scores using the 1600-point scale. This process allowed for consistency in all SAT scores. Second, ACT scores (total and sub scores) were converted into SAT scores using the ACT/SAT Concordance Tables provided by ACT, Inc. on their website. Lastly, for students who had scores reported for multiple attempts of the SAT (including the ACT converted scores), the highest total score, as well as the highest score for each subsection, was utilized in the analyses for this study. All other scores were deleted from the analyses.

The financial information collected for this study is also stored in PeopleSoft and managed by FIU's Office of Financial Aid. Federal and State Aid disbursed to students via the Pell Grant, Bright Futures, and or loans is recorded in PeopleSoft, as well as information collected from the students' FAFSA. Expected Family Contribution, as mentioned previously, is calculated based on information submitted by the student on

their FAFSA. The Office of Financial Aid organizes that information in ranges to determine student eligibility for institutional aid. All variables were coded accordingly as listed in Table 8.

Table 8

Dependent and Independent Variables

Variable Type	Label	Description
Dependent Variables	Four-year Graduation Outcome	A single dummy-coded variable indicating four-year graduation (0=did not graduate, 1=graduated)
	Six-year Graduation Outcome	A single dummy-coded variable indicating six-year graduation (0=did not graduate, 1=graduated)
Independent Variables: *Demographic*	Race/Ethnicity	Five dummy-coded variables indicating student's race/ethnicity (Hispanic was the reference group): White (0=non-White, 1=White) Black (0=non-Black, 1=Black) Hispanic* (0=non-Hispanic, 1=Hispanic) Asian (0=non-Asian, 1=Asian) Other (0=non-other, 1=other) (American Indian, Pacific Islander, 2 or more races, international)
	Gender	A single dummy-coded variable indicating student's gender (0=non-female, 1=female)
	Florida (FL) Residency Status	A single dummy-coded variable indicating student's residency status (0=non-FL resident, 1=FL resident)
	International Student Status	A single dummy-coded variable indicating international status (0=non-international, 1=international)
	First-Generation Status	A single-dummy-coded variable indicating student's First-Generation status (0=non-First-Gen, 1=First-Gen)

	Housing Status	A single-dummy-coded variable indicating if student lived on-campus (0=did not live on-campus, 1=lived on-campus)
Academic	Type of High School Attended	Three dummy-coded variables to indicate type of high school attended (Public was the reference group): Public* (0=did not attend public school, 1=attended public school) Private (0=did not attend private school, 1=attended private school) Other (0=did not attend other school, 1=attended other school)
	Retention Outcome	A single dummy-coded variable indicating if the student was retained (0=not retained, 1=retained)
	Accelerated Credits	Two dummy-coded variables indicating if student started college having earned accelerated credits (Dual Enrollment and/or test credits) Dual Enrollment (0=no DE credits, 1=DE credits) Test Credits (0=no test credits, 1=test credits)
	Final Weighted High School GPA	A continuous variable taking difficulty of courses into account, such as Honors.
	Cumulative FIU GPA	A continuous variable based on a 4.0 scale
	SAT Math Scores	Continuous variable ranging from 220-800
	SAT Reading/Writing Scores	Continuous variable ranging from 200-800
Financial	Financial Aid Type	Eight dummy-coded variables indicating type of aid student received: Federal Aid (0=No Federal Aid, 1=received Federal Aid) State Aid (0=no State Aid, 1=received State Aid) Institutional Aid (0=no institutional aid, 1=received institutional aid)

	Bright Futures (0=no Bright Futures, 1=received Bright Futures) Pell Grant (0=no Pell Grant, 1=received Pell Grant) Loans (0=no loans, 1=received loans) Other Aid (0=no other aid, 1=received other aid) Financial Aid (0=no financial aid, 1= received financial aid)
Estimated Family Contribution	Dummy Coded Variable with seven categories for EFC: 1= 0 EFC 2=1-1000 3=1001-3000 4=3001-5576 5=5577-8600 6=8601+ 7*=No EFC Reported

**Indicated Reference Category*

Data Processing and Analysis

Initially, the data collected were input into SPSS for the purposes of analysis. Initial diagnostic analyses were conducted to check for errors in data entry; this consisted of examining the minimum and maximum values for each variable. Any data points found to be out of range with regard to either the minimum or maximum value of the measure in question were checked for accuracy and recoded as required. Any missing data present within these data were coded as "system missing" in SPSS, with cells containing a period to illustrate this fact. In addition, variables were recoded or transformed into new variables so that they conformed to the response categories of each of these variables, as was proposed.

A series of descriptive statistics were conducted initially on these data. Frequency tables were constructed for all categorical measures, reporting the sample sizes and percentages of response associated with each response category. Measures of central

tendency (the mean and median) and variability (the standard deviation, range, and minimum and maximum scores) were reported for all continuous measures included in this study. Bivariate analyses were then conducted between the independent and dependent variables in order to present an initial illustration of the relationships between these measures and to determine whether these measures independently have significant relationships with this study's dependent measures. As both dependent variables were dichotomous, the method of analysis chosen depended upon the level of measurement of the independent variable in question. When this was dichotomous, Pearson's chi-square was used, along with the phi coefficient, as these analyses are suited to the determination of the relationship between two dichotomous measures, while chi-square can be used more generally when both measures are categorical but not necessarily dichotomous (Hawkins, 2019). In cases where the independent variable was ordinal, the Mann-Whitney *U* test was conducted, which is appropriate when median differences in some non-normal measure are compared between two categories. Finally, the independent-samples *t*-test was used in cases of continuous independent variables, as this test determines whether there is a significant mean difference in some continuous measure on the basis of the two categories examined (Hawkins, 2019).

Following this, logistic regression analyses were conducted, with one model being run for each dependent variable, and with all models including all proposed independent variables included in this study. Logistic regression is particularly suited to regression models that incorporate dichotomous dependent variables (Mertler & Vannatta, 2017), with all dependent variables in this study being dichotomous. Odds ratios resulting from the logistic regressions conducted were used for the interpretation of the associations

between the independent and dependent variables. The odds ratios relate to the factor change in the odds of being in the category specified by a response of "1" with respect to the dependent variable on the basis of a one-unit change in the independent variable. Essentially, the odds ratio explains the extent to which a change in the independent variable impact the odds of being in either category of the dependent variable, whether this association is significant, and the direction of the association (Mertler & Vannatta, 2017). As stated previously, an alpha of .05 was selected for use in this study. Therefore, all results with calculated probability levels below .05 were deemed statistically significant. These results also determined whether this study's hypotheses were rejected or not rejected.

The assumptions of logistic regression include that of a dichotomous dependent variable being present in the model, proper model specification, which relates to all relevant variables being included in the model, and all irrelevant variables excluded, independent error terms, low measurement error, linearity between the continuous independent variables and the log odds of the dependent variable, the lack of perfect separation or perfect (Howell, 2013), the lack of high multicollinearity, the lack of outliers, adequate sample size and sampling, additivity, and expected dispersion (Howell, 2013). Multicollinearity occurs when two or more predictor variables are interrelated and, ultimately, measure the same thing (Howell, 2013). To detect multicollinearity, a correlation coefficients table was created on SPSS using all independent variables. If the correlation coefficient was 1, -1, or close to it, multicollinearity is high and therefore, one of the variables was removed. Multicollinearity was found between SAT total score and SAT Math and ERW scores. As a result, SAT total score was removed as an independent

variable. In addition, high multicollinearity was detected between weighted and unweighted high school GPA; therefore, unweighted high school GPA was removed since weighted high school GPA is utilized for university admissions purposes.

Research and Statistical Hypotheses

RH1: Demographic, academic, and financial factors significantly predict four-year graduation for first-time-in-college students.

RH2: Demographic, academic, and financial factors significantly predict six-year graduation for first-time-in-college students.

RH3: Demographic factors (race/ethnicity, gender, residency status, international status, first-generation status, and on-campus housing status) better predict four-year graduation for first-time-in-college students than academic and financial factors.

RH4: Academic factors (cohort year, type of high school attended, accelerated credits, weighted high school GPA, unweighted high school GPA, FIU GPA, SAT/ACT scores), better predict four-year graduation for first-time-in-college students over demographic and financial factors.

RH5: Financial factors (federal aid, state aid, institutional aid, financial aid, loans, and Estimated Family Contribution), better predict four-year graduation for first-time-in-college students than demographic and academic factors.

RH6: Demographic factors (race/ethnicity, gender, residency status, international student status, first-generation status, and on-campus housing status) better predict six-year graduation for first-time-in-college students than academic and financial factors.

RH7: Academic factors (cohort year, type of high school attended, accelerated credits, weighted high school GPA, unweighted high school GPA, FIU GPA, SAT/ACT

scores), better predict six-year graduation for first-time-in-college students than demographic and financial factors.

RH8: Financial factors (federal aid, state aid, institutional aid, and Estimated Family Contribution), better predict six-year graduation for first-time-in-college students than demographic and academic factors.

RH9: Demographic, academic, and financial variables that were significant in predicting four-year graduation rates changed over time.

RH10: Demographic, academic, and financial variables that were significant in predicting six-year graduation rates changed over time.

Summary

The purpose of this study was to analyze data on FTIC students at FIU to analyze whether demographic, academic, and financial variables are significant in predicting whether they graduated in four or six years. In all, institutional data for 30,119 students who were part of the 2010-2016 FTIC cohorts were analyzed. The demographics of the sample population used in this study were similar to the institution's overall demographics. Fifty-seven percent of the institution's students are female, while 55% of the sample population in this study were female. With regard to race, 61% of the institution's students are Hispanic, 15% White, 13% Black, and 4% Asian. In comparison, the sample population was 69% Hispanic, 9% White, 11% Black, and 3% Asian.

The data for this study was provided by the institution's information management office and obtained from the university's student records system. The data was then coded and entered into SPSS in order to conduct several binary logistic regression

analysis on 30,119 FTIC students. In order to analyze the three groups of independent variables, the -2 Log Likelihood, full model Chi-Square, Wald statistic, and Negelkerke R^2 were utilized to determine statistical significance in predicting whether FTIC students graduated in four or six years. These analyses helped answer the ten research questions developed for this study. The detailed data and results of these analyses are provided in Chapter IV.

CHAPTER IV

RESULTS

This study examined the effects of several demographic (race/ethnicity, gender, residency status, international status, first-generation status, and on-campus housing status), academic (type of high school, weighted high school GPA, dual enrollment, accelerated test credits, SAT Math and ERW scores, retention outcome, and FIU cumulative GPA), and financial variables (federal aid, state aid, institutional aid, Bright Futures, Pell Grant, financial aid, loans, EFC range) on the four- and six-year graduation rates of FTIC students admitted between Summer 2010 through Fall 2016. More specifically, 30,179 FTIC students were included in the four-year graduation analysis, and 21,426 students were included in the six-year graduation analysis in an effort to answer ten research questions. Their race/ethnicity, gender, residency status, housing status, international student status, first-generation status, type of high school attended, retention outcome, accelerated credits, weighted high school GPA, cumulative FIU GPA, SAT scores, financial aid type, and EFC range were analyzed in relationship to whether those students graduated in four or six years. In addition, this analysis controlled for cohort year.

In this chapter the results of the logistic regression analysis are presented to provide the University with information that can help inform decisions regarding student support programs that help increase four and six year graduation rates. By including variables available before students are admitted (high school GPA, accelerated credits, etc.), as well as some that become available during student's first year (housing status,

financial aid, etc.), the institution can design early interventions that may help decrease the number of students who leave the university or fall off track from timely graduation.

Sample Population

The sample obtained from the University's student record system included 30,179 FTIC students admitted in summer or fall of 2010 through 2016; however, 6 duplicates were removed leaving a sample of 30,173. In addition, 54 students were identified as missing both weighted high school GPA and SAT/ACT scores. Given that both high school GPA and an SAT or ACT score are required for admission into the university and that those two variables were important for this analysis, those 54 students were removed. As a result, the final sample for this study included 30,119 FTIC students. All 30,119 students were included in the analysis for four-year graduation; however, only 21,426 of the 30,119 were included in the six-year graduation analysis since the 2015 and 2016 cohorts (8,693 students) have not yet passed the six-year graduation deadline and therefore were removed from the six-year analysis. Nonetheless, when examining the demographics for each analysis, the percentage by gender and race/ethnicity are similar for the four- and six-year analysis, as highlighted in Table 9 below. The table also highlights the large percentage of Hispanic students in the study, which classifies the institution as an HSI.

Table 9

Demographics of Sample Population

Four-Year Analysis

	Frequency	Percentage
2010 Cohort	3937	13.0%
2011 Cohort	4475	14.9%
2012 Cohort	4347	14.4%
2013 Cohort	4523	15.0%
2014 Cohort	4144	13.8%
2015 Cohort	4187	13.9%
2016 Cohort	4506	15.0%
Female	16537	54.9%
Male	13582	45.1%
Hispanic	20857	69.2%
White	2777	9.2%
Black	3335	11.1%
Asian	925	3.1%
Other	2225	7.4%

Six-Year Analysis

	Frequency	Percentage
2010 Cohort	3937	18.4%
2011 Cohort	4475	20.9%
2012 Cohort	4347	20.3%
2013 Cohort	4523	21.1%
2014 Cohort	4144	19.3%
Female	11696	54.6%
Male	9730	45.4%
Hispanic	14745	68.8%
White	2076	9.7%
Black	2425	11.3%
Asian	680	3.2%
Other	1500	7.0%

Logistic Regressions Models for Q1 – Q8

All logistic regression analyses conducted incorporated demographic, academic, and financial predictors. Demographic predictors included race (coded as Hispanic [used as reference group], White, Black, Asian, and other), gender (included as a dummy

measure for female), state residency (Florida versus other), international status (international status versus other), first-generation status, and housing status (on-campus versus not on-campus). Academic predictors included cohort year, high school category (coded as public [used as reference group], private, and other), retention outcome, accelerated test credits, which were all included as a series of dummy measures, weighted high school GPA, FIU cumulative GPA, and SAT math and ERW scores. Lastly, financial predictors included federal, state, and institutional aid measures, with these aid measures included as a series of dummy variables, and EFC range, which consisted of seven categories in total.

While the logistic regressions conducted with four-year graduation incorporated cohort years 2010 through cohort year 2016, this could not be done with regard to the logistic regressions conducted with six-year graduation as there were not valid data present with respect to cohort years 2015 or 2016. As previously mentioned, the lack of valid data present is due to the six-year graduation deadline for cohorts 2015 and 2016, which have not yet passed. For this reason, data representing cohort years 2015 and 2016 were removed from the six-year models. To answer Q1 and Q2, the models included all independent variables. To answer Q3-Q8, the groups of independent variables were added in blocks to determine their significance, if any, as compared to the other groups of independent variables.

Q1 – Do demographic, academic, and financial factors significantly predict whether first-time-in-college students graduate in four years?

The initial binary logistic regression analysis was conducted with four-year graduation using all independent variables: demographic, academic, and financial.

Results for the overall model using all independent variables (demographic, academic, and financial) as predictors were statistically significant in distinguishing between graduating and not graduating in four years [-2 Log Likelihood = 27344.193, $\chi^2(27) = 10791.696$, $p < .001$]. The model prior to including all variables (block 0) had a higher -2 Log Likelihood of 38135.888 and correctly classified 66.9% of cases. However, the model including all variables (block 1) correctly classified 76.2% of cases with a -2 Log Likelihood of 27344.193. The decrease in the -2 Log Likelihood from block 0 to block 1 indicated that the demographic, academic and financial predictor variables accounted for a significant amount of unexplained variance in the overall model. In other words, adding all variables into the model increased the number of correct cases classified by almost 10 percent. The Negelkerke R^2 is .420, which means that 42% of the variance in four-year graduation rates is explained by demographic, academic, and financial variables. Wald statistics indicated that race, gender, residency, housing, type of high school attended, accelerated test credits, weighted high school GPA, FIU cumulative GPA, state aid and institutional aid, and EFC range significantly predict four-year graduation, while international status, first-generation status, retention outcome, SAT scores, and federal aid were not significant. Regression coefficients for all independent variables are presented in Table 10. Variables that were not statistically significant were not included in the table.

Table 10

Regression Coefficients for Q1

	B	*Wald*	*df*	*p*	Odds Ratio
Black	0.136	5.814	1	0.016	1.146
White	-0.270	22.984	1	0.000	0.764
Gender	0.440	183.829	1	0.000	1.553
Residency	0.303	12.094	1	0.001	1.354
First Generation	-0.083	4.288	1	0.038	0.920
Housing	0.457	120.509	1	0.000	1.579
Private HS	0.087	3.311	1	0.069	1.091
Other HS	0.137	7.537	1	0.006	1.146
Weighted HS GPA	0.331	57.049	1	0.000	1.392
Dual Enrollment	0.413	70.852	1	0.000	1.512
Accelerated Test Credits	0.318	92.694	1	0.000	1.374
FIU CUM GPA	2.295	3601.475	1	0.000	9.924
Institutional Aid	0.348	100.756	1	0.000	1.416
Other Aid	0.131	4.566	1	0.033	1.140
Financial Aid	0.195	9.194	1	0.002	1.215
EFC Range	0.032	8.404	1	0.004	1.033
Constant	-10.165	1475.178	1	0.000	0.000

There are a few things worth noting. All but one demographic variables were found to be significant. With regard to race, significance was found among Black and White students as compared with the comparison category of Hispanics. Specifically, Blacks were associated with an odds ratio of having graduated that were increased by 15% compared to Hispanics, with Whites having an odds ratio of having graduated that were decreased by a factor of 24% as compared with Hispanics. With regard to gender, females were found to have an odds ratio of having graduated that were increased by a factor of 55% as compared with males. Florida residents were found to have an odds ratio of having graduated that were increased by 35% as compared with non-Florida residents, while those who lived on-campus were found to have an odds ratio of having graduated that were increased by 58% as compared with those who were living off-campus. First-

generation status was also found to be significant, albeit, with a small negative effect, resulting in the odds ratio of graduating in four-years decreased by 7% compared to students who are not first-generation.

In addition, five of the eight academic variables were found to be significant in predicting four-year graduation. First, the type of high school the students attended was significant with students who attended high schools classified as other (home schooling, GED, etc.) having increased odds of graduating in four-years over students who attended public school. College credits earned while in high schools, either via an exam or dual enrollment, were also significant. Students with accelerated test credits, such as AP or IB, had an odds ratio of having graduated that was increased by 37% as compared with those who did not have accelerated test credits, while students with dual enrollment credits had odds ratio of graduating in four years that were increased 51% as compared to students without dual enrollment. Weighted high school GPA and FIU cumulative GPA were also found to be significant. A one unit increase in weighted high school GPA was associated with an odds ratio of graduating that was increased by 19%, while a one unit increase in FIU cumulative GPA increased a student's odds of graduating eight fold.

Lastly, only four financial variables were found to be significant predictors of four-year graduation. Institutional aid is the variable with the largest effect of the financial predictors with the odds ratio of students with institutional aid increasing by 42%. Other types of aid (i.e., private loans and scholarships) were also found to have a positive effect that increased the odds ratio of graduating in four years by 14%. Having any type of financial aid was found to be significant with increasing odds ratio of graduating by 21%. Finally, although EFC range was also found to be significant, its

effect is small with only increasing the odds of graduation by 3%, but specifically for those in the highest range of EFC.

Q2 – Do demographic, academic, and financial factors significantly predict whether first-time-in-college students graduate in six years?

The initial binary logistic regression analysis was conducted with six-year graduation using all independent variables: demographic, academic, and financial. As mentioned earlier in this chapter, this model was identical to the model conducted with four-year graduation with the exception that the 2015 and 2016 were removed from this model. Results for the overall model using all independent variables (demographic, academic and financial) as predictors was statistically significant in distinguishing between graduating and not graduating in six years [-2 Log Likelihood = 19440.375, $\chi^2(27) = 9625.101$, $p < .001$]. The model prior to including all variables (Block 0) had a higher -2 Log Likelihood of 29065.476 and correctly classified 58.1% of cases. However, the model including all variables (Block 1) correctly classified 79.4% of cases with a -2 Log Likelihood of 19440.375. The decrease in the -2 Log Likelihood from Block 0 to Block 1 indicated that the demographic, academic, and financial predictor variables accounted for a significant amount of unexplained variance in the overall model. In other words, adding all variables into the model increased the number of correct cases classified by 21.3%, which is statistically significant. The Negelkerke R^2 is .488, which means that 48.8% of the variance in six-year graduation rates is explained by demographic, academic, and financial variables. Regression coefficients are presented in Table 11. Like in the four-year model, Wald statistics indicated that race, gender, residency, housing, type of high school, accelerated test credits, dual enrollment, FIU

cumulative GPA, and institutional aid were also significantly in predicting six-year graduation. However, unlike the four-year model, international status, SAT math scores, SAT ERW scores, federal aid, and loans were also found to be significant in predicting six-year graduation. Variables that were not statistically significant were not included in the table.

Table 11

Regression Coefficients for Six-year Graduation Analysis

	B	*p*	Odds Ratio
Other	-0.330	0.000	0.719
White	-0.547	0.000	0.579
Gender	0.134	0.000	1.144
Residency	0.708	0.000	2.031
International	0.684	0.000	1.982
Housing	0.363	0.000	1.438
Other HS	0.128	0.049	1.136
SAT Math	-0.001	0.005	0.999
SAT ERW	-0.002	0.000	0.998
Dual Enrollment	0.196	0.003	1.216
Accelerated Test Credits	0.287	0.000	1.332
FIU CUM GPA	2.333	0.000	10.304
Institutional Aid	0.123	0.003	1.131
Federal Aid	-0.202	0.002	0.817
Loans	0.260	0.000	1.297
Constant	-5.366	0.000	0.005

There are a few things worth noting in the results of the six-year analysis. All but one demographic variables were found to be significant. With regard to race, significance was found among White students and students classified as Other as compared with the comparison category of Hispanics. Specifically, White students were associated with an odds ratio of having graduated that were decreased by 42% compared with Hispanics, with students classified as Other having an odds ratio of having graduated that were

decreased by a factor of 28% as compared with Hispanics. With regard to gender, females were found to have an odds ratio of having graduated that were increased by a factor of 14% as compared with males. Florida residents were found to have an odds ratio of having graduated that were increased by 103% as compared with non-Florida residents, while those who lived on-campus found to have an odds ratio of having graduated that were increased by 44% as compared with those who were living off-campus. International status was also found to be significant, however, with the odds ratio of international students graduating in four-years increased by 98% as compared to non-international students.

In addition, six of the eight academic variables were found to be significant in predicting four-year graduation. First, the type of high school the students attended was significant, with students who attended high schools classified as other (home schooling, GED, etc.) having 14% increased odds of graduating in four-years over students who attended public school. College credits earned while in high schools, either via an exam or dual enrollment were also significant. Students with accelerated test credits, such as AP or IB, had an odds ratio of having graduated that were increased by 33% as compared with those who did not have accelerated test credits, while students with dual enrollment credits had odds of graduating in four years that were increased by 22% as compared to students without dual enrollment. With regard to FIU cumulative GPA, a one unit increase resulted in a student's odds of graduating that were increased by 930%. Although SAT Math and ERW scores were also found to be significant, their effects were very small and a one unit increase in the score resulted in increased odds of less than 1%.

Lastly, only three financial variables were found to be significant predictors of six-year graduation. Having institutional aid increased the odds ratio of a student graduating by 13%, while having federal aid had the opposite effect and decreased a student's odds of graduating by 18%. Loans, regardless of source, were also found to have a positive effect that increased the odds ratio of graduating in six years by 30%.

Q3 – Do demographic factors better predict four-year graduation for first-time-in-college students than academic and financial factors?

Results for the overall model using all independent variables (demographic, academic, and financial) as predictors were statistically significant in distinguishing between graduating and not graduating in four years [-2 Log Likelihood = 27344.193, $\chi^2(27) = 10791.696$, $p < .001$]. The model using only demographic variables (race/ethnicity, gender, residency status, international status, first-generation status, and on-campus housing status) was also found to be significant in predicting whether a student graduated in four years or not [-2 Log Likelihood = 36861.084, $\chi^2(9) = 1274.805$, $p < .001$]. The model prior to including the demographic variables (block 0) had a -2 Log Likelihood of 38135.888 and correctly classified 66.9% of cases. Similarly, the model including demographic variables (block 1) correctly classified 66.9% of cases. Although there was a slight decrease in the -2 Log Likelihood from block 0 to block 1, the ability to predict whether students graduated in four years or not was exactly the same with or without demographic variables included. The Negelkerke R^2 is .058, which means that 5.8% of the variance in four-year graduation rates is explained by demographic variables. Regression coefficients are presented in Table 12. Wald statistics indicated that race, gender, international status, first-generation status and on-campus housing status were

significantly predictive of four-year graduation ($p < .05$). Residency status was not included in the table, as it was not found to be statistically significant.

Table 12

Regression Coefficients for Question 3

	B	*Wald*	*df*	*p*	Odds Ratio
Asian	.124	3.043	1	.081	1.132
Black	-.507	125.422	1	.000	.602
Other	-.381	34.095	1	.000	.683
White	-.263	32.470	1	.000	.768
Gender	.816	995.076	1	.000	2.261
International	.681	42.139	1	.000	1.976
First-Generation	-.196	36.609	1	.000	.822
Housing	.263	62.354	1	.000	1.301
Constant	-1.210	325.509	1	.000	.298

Although most of the demographic variables were found to be statistically significant at ($p. < .05$), gender seems to be the demographic variable with the largest effect on four-year graduation, followed by international student status. Females were 2.2 times more likely to graduate in four years than males, while international students were almost twice as likely to graduate in four years as non-international students were. With regard to race/ethnicity, Asians had an odds ratio of graduating that was increased by 13% over Hispanic students, while all other races had a decreased odds ratio of graduating over Hispanics, with Blacks having decreased odds ratio of 39.8%, Whites having decreased odds ratio of 23% and others having decreased odds ratio of 31.7%. Living on-campus also had a positive effect and increased a student's odds ratio of graduating in four years by 30% over those who lived off campus. Being a first-generation student had a negative effect on graduating in four-years, with the odds ratio of graduating decreasing by 17.8% over students who were not first-generation.

Q4 – Do academic factors better predict four-year graduation for first-time-in-college students than demographic and financial factors?

Results for the overall model using all independent variables (demographic, academic, and financial) as predictors were statistically significant in distinguishing between graduating and not graduating in four years [-2 Log Likelihood = 27344.193, $\chi^2(27) = 10791.696$, $p < .001$]. The model using only academic variables (type of high school attended, accelerated credits, weighted high school GPA, unweighted high school GPA, FIU GPA, SAT/ACT scores) was also found to be significant in predicting whether a student graduated in four years or not [-2 Log Likelihood = 27932.327, $\chi^2(9) = 10203.561$, $p < .001$]. The model prior to including the academic variables (block 0) had a -2 Log Likelihood of 38135.888 and correctly classified 66.9% of cases. However, the model which included academic variables (block 1) correctly classified 75.6% of cases with a -2 Log Likelihood of 27932.327. The decrease in the -2 Log Likelihood from Block 0 to Block 1 indicates that academic variables account for a large amount of the unexplained variance in the overall model. The ability to predict whether students graduated in four year or not was significantly higher with the academic variables included. The Negelkerke R^2 is .401, which means that 40.1% of the variance in four-year graduation rates is explained by academic variables. Wald statistics indicated that type of high school, SAT Math score, weighted high school GPA, dual enrollment, accelerated test credits, and FIU cumulative GPA were significantly predictive of four-year graduation ($p < .05$). Regression coefficients are presented in Table 13. Retention outcome and SAT ERW were not included in the table as they were not found to be statistically significant at $p < .05$.

Table 13

Regression Coefficients for Question 4

	B	*Wald*	*df*	*p*	Odds Ratio
Private HS	.051	1.261	1	.261	1.051
Other HS	.227	28.708	1	.000	1.255
SAT Math	-.001	32.470	1	.000	.769
Weighted HS GPA	.528	164.170	1	.000	1.695
Dual Enrollment	.269	36.055	1	.000	1.309
Accelerated Test Credits	.316	95.709	1	.000	1.372
FIU Cumulative GPA	2.266	3730.463	1	.000	9.642
Constant	-9.465	2073.480	1	.000	.000

Students who attended high schools classified as other (home school, GED, out-of-state schools), had increased odds ratio of 25% to graduate in four years over students who attended public school. Although the SAT ERW score was not found to be significant, SAT MAT score was significant with a one unit increase, decreasing the odds of graduating in four years by 23%. Weighted high school GPA was also found to be significant, with a one unit increase in score having an increased odds ratio of 69% of graduating in four years. In addition, students who had dual enrollment and/or accelerated test credits had increased odds ratio of graduating in four years of 30% and 37%, respectively. Lastly, FIU cumulative GPA had the largest impact with regard to odds ratio, with a one unit increase in GPA having an odds ratio of 9.642.

Q5 – Do financial factors better predict four-year graduation for first-time-in-college students than demographic and academic factors?

Results for the overall model using all independent variables (demographic, academic, and financial) as predictors was statistically significant in distinguishing between graduating and not graduating in four years [-2 Log Likelihood = 27344.193, $\chi^2(27) = 10791.696$, $p < .001$]. The model using only financial variables (federal aid,

state aid, institutional aid, financial aid, loans, and Estimated Family Contribution) was also found to be significant in predicting whether a student graduated in four years or not [-2 Log Likelihood = 36863.614, $\chi^2(9) = 1389.859$, $p < .001$]. The model prior to including the financial variables (block 0) had a -2 Log Likelihood of 38135.888 and correctly classified 66.9% of cases. However, the model which included financial variables (block 1) correctly classified 67.9% of cases with a -2 Log Likelihood of 36863.614. The decrease in the -2 Log Likelihood from Block 0 to Block 1 indicates that financial variables account for a small amount of the unexplained variance in the overall model. The ability to predict whether students graduated in four years or not slightly increased with the financial variables included. The Negelkerke R^2 is .063, which means that 6.3% of the variance in four-year graduation rates is explained by financial variables. Wald statistics indicated that Pell, institutional aid, state aid, federal aid, other aid, loans, financial aid and EFC range were significantly predictive of four-year graduation ($p < .05$). Regression coefficients are presented in Table 14. Bright Futures was not included in the table as it was not found to be statistically significant at $p < .05$.

Table 14

Regression Coefficients for Question 5

	B	*Wald*	*df*	*p*	Odds Ratio
Pell	.302	72.987	1	.000	1.353
Institutional Aid	.696	631.812	1	.000	2.005
State Aid	.159	10.049	1	.002	1.172
Federal Aid	-.163	13.357	1	.000	.849
Other Aid	.456	81.152	1	.000	1.578
Loans	-.261	76.835	1	.000	.771
Financial Aid	.354	43.329	1	.000	1.424
EFC Range	.096	112.906	1	.000	1.100
Constant	-1.779	.071	1	.000	.169

All financial variables, but one, were significant in predicting four-year graduation. Two, Federal aid and loans, had negative effects on four-year graduation. Students with federal aid had decreased odds ratio of 15% as compared to those without federal aid, and those with loans had decreased odds ratio of 23% compared to those without loans. Students with institutional aid were two times more likely to graduate in four years than students without institutional aid, while students with other types of aid (private loans or scholarships) were 1.5 times more likely to graduate than those without other types of aid. Having any type of financial aid increased the odds ratio of graduating in four years by 42 percent. In addition, having the Pell Grant increased the odds ratio of graduating in four-years by 35 percent. Finally, EFC range was also significant. When compared to students without an EFC range reported, students in the lower EFC ranges had lower odds of graduating in four-years, while those in the highest EFC range had higher odds of graduating in four years.

Q6 – Do demographic factors better predict six-year graduation for first-time-in-college students than academic and financial factors?

Results for the overall model using all independent variables (demographic, academic, and financial) as predictors was statistically significant in distinguishing between graduating and not graduating in six years [-2 Log Likelihood = 19440.375, $\chi^2(27) = 9625.101$, $p < .001$]. The model using only demographic variables (race/ethnicity, gender, residency status, international status, first-generation status, and on-campus housing status) was also found to be significant in predicting whether a student graduated in six years or not [-2 Log Likelihood = 28268.144, $\chi^2(9) = 797.332$, $p < .001$]. The model prior to including the demographic variables (block 0) had a -2 Log

Likelihood of 29065.476 and correctly classified 58.1% of cases. Similarly, the model including demographic variables (block 1) correctly classified 60.5% of cases with a -2 Log Likelihood of 28268.144. The decrease in the -2 Log Likelihood from Block 0 to Block 1 indicates that demographic variables account for a small amount of the unexplained variance in the overall model. The ability to predict whether students graduated in six years or not slightly increased with the demographic variables included. Regression coefficients are presented in Table 15. The Negelkerke R^2 is .049, which means that 4.9% of the variance in six-year graduation rates is explained by financial variables. Wald statistics indicated that all variables significantly predict six-year graduation ($p < .05$).

Table 15

Regression Coefficients for Question 6

	B	*Wald*	*df*	*p*	Odds Ratio
Asian	.172	4.246	1	.039	1.188
Black	-.646	183.991	1	.000	.524
Other	-.524	58.830	1	.000	.592
White	-.522	113.029	1	.000	.593
Gender	.586	426.362	1	.000	1.797
Residency	.454	38.860	1	.000	1.575
International	.978	60.319	1	.000	2.659
First-Generation	-.197	31.694	1	.000	.821
Housing	.287	54.387	1	.000	1.333
Constant	-.298	15.684	1	.000	.742

All demographic variables were found to be statistically significant at ($p. < .05$). With regard to race, Asian student odds ratio were 19% higher than Hispanic student odds ratio of graduating, while White and other student odds ratio were 41% lower and Black student odds ratio were 48% lower. Gender, residency, international status, and on-campus housing status all had a positive effect. Females had 1.8 times odds of graduating

in six years than odds of males. International students had 2.7 times odds of graduating than non-international students, Florida residents had 1.6 times odds of graduating than non-residents, and students who lived on-campus had 1.3 times odds of graduating in six years than students who lived off-campus. Lastly, first-generation students had 1.3 times lower odds of graduating in six years than non-first-generation students.

Q7 – Do academic factors better predict six-year graduation for first-time-in-college students than demographic and financial factors?

Results for the overall model using all independent variables (demographic, academic, and financial) as predictors was statistically significant in distinguishing between graduating and not graduating in six years [-2 Log Likelihood = 19440.375, $\chi^2(27) = 9625.101$, $p < .001$]. The model using only academic variables (type of high school attended, accelerated credits, weighted high school GPA, unweighted high school GPA, FIU GPA, SAT/ACT scores) was also found to be significant in predicting whether a student graduated in six years or not [-2 Log Likelihood = 19705.928, $\chi^2(9) = 9359.548$, $p < .001$]. The model prior to including all academic variables (block 0) had a -2 Log Likelihood of 29065.476 and correctly classified 58.1% of cases. However, the model which included academic variables (block 1) correctly classified 79.1% of cases with a -2 Log Likelihood of 19705.928. The decrease in the -2 Log Likelihood from Block 0 to Block 1 indicates that academic variables account for a large amount of the unexplained variance in the overall model. The ability to predict whether students graduated in six years or not was significantly higher with the academic variables included. The Negelkerke R^2 is .477, which means that 47.7% of the variance in six-year graduation rates is explained by financial variables. Wald statistics indicated that SAT

Math and ERW scores, weighted high school GPA, dual enrollment, accelerated test credits, and FIU cumulative GPA significantly predict four-year graduation ($p < .05$). Regression coefficients are presented in Table 16. Type of high school and retention outcome were not included in the table, as they were not found to be statistically significant at $p < .05$.

Table 16

Regression Coefficients for Question 7

	B	*Wald*	*df*	*p*	Odds Ratio
SAT Math	-.001	17.734	1	.000	.999
SAT ERW	-.002	25.366	1	.000	.998
Weighted HS GPA	.112	5.314	1	.21	1.119
Dual Enrollment	.295	22.918	1	.000	1.309
Accelerated Test Credits	.318	67.410	1	.000	1.372
FIU Cumulative GPA	2.287	4061.498	1	.000	9.849
Constant	-4.895	413.955	1	.000	.007

All but two Academic variables were found to be significant in predicting six-year graduation. Two of these variables, SAT Math and ERW scores had very small negative effect on predicting graduation, with less than .5% lower odds ratio. Weighted high school GPA and FIU cumulative GPA both had a positive effect. A one unit increase in weighted high school GPA increased odds of graduating by 12%, while a one unit increase in FIU GPA increased odds of graduating by 885 percent. Lastly, students with dual enrollment and/or accelerated test credits had 31% and 37% higher odds of graduating in six years than students who had neither.

Q8 – Do financial factors better predict six-year graduation for first-time-in-college students than demographic and academic factors?

Results for the overall model using all independent variables (demographic, academic, and financial) as predictors was statistically significant in distinguishing between graduating and not graduating in six years [-2 Log Likelihood = 19440.375, $\chi^2(37) = 9625.101$, $p < .001$]. The model using only financial variables (federal aid, state aid, institutional aid, financial aid, loans, and Estimated Family Contribution) was also found to be significant in predicting whether a student graduated in six years or not [-2 Log Likelihood = 28351.416, $\chi^2(9) = 714.060$, $p < .001$]. The model prior to including all financial variables (block 0) had a -2 Log Likelihood of 29065.476 and correctly classified 58.1% of cases. However, the model including financial variables (block 1) correctly classified 60.3% of cases with a -2 Log Likelihood of 28351.416. The decrease in the -2 Log Likelihood from Block 0 to Block 1 indicates that financial variables account for a small amount of the unexplained variance in the overall model. The ability to predict whether students graduated in six years or not slightly increased with the financial variables included. The Negelkerke R^2 is .044, which means that 4.4% of the variance in six-year graduation rates is explained by financial variables. Wald statistics indicated that Pell, Bright Futures, institutional aid, federal aid, other aid, financial aid, and EFC range significantly predict six-year graduation ($p < .05$). Regression coefficients are presented in Table 17. State aid and loans were not included in the table, as they were not found to be statistically significant at $p < .05$.

Table 17

Regression Coefficients for Question 8

	B	*Wald*	*df*	*p*	Odds Ratio
Pell	.266	48.100	1	.000	1.304
Bright Futures	.445	63.554	1	.000	1.560
Institutional Aid	.326	110.683	1	.000	1.385
Federal Aid	-.290	33.182	1	.000	.748
Other Aid	.304	23.918	1	.000	1.355
Financial Aid	.204	11.333	1	.001	1.226
EFC Range	.039	15.265	1	.000	1.040
Constant	.375	19.968	1	.000	1.455

All but one of the financial variables that were significant had positive effects on six-year graduation. The only financial variable with a negative effect was federal aid, with students who had federal aid having 25% lower odds ratio of graduating in six years than students without federal aid. On the contrary, students with the Pell Grant, which is a type of federal aid, had increased odds ratio of graduating in six years than students without the Pell grant. Students with Bright Futures have 1.6 times odds of graduating than students without Bright Futures. Institutional aid and other aid had similar effects, with students with institutional aid having 39% increased odds of graduating than student without institutional aid and students with other aid having 36% increased odds of graduating over students without other aid. Having financial aid in general increased a student's odds ratio of graduating by 1.2 times. Lastly, with regard to EFC range, students with an EFC range of 0 had 77% lower odds of graduating in six-years than students with no EFC reported.

Logistic Regression Models for Q9 & Q10

Several additional logistic regression analyses were conducted, one per cohort for four-year graduation and one per cohort year for six-year graduation, to examine whether

the effects of the independent variables significantly changed over time for both the four- and six-year models. The independent variables included in these models consisted of the same set of independent variables included in the first two logistic regression analyses conducted, demographic (race, gender, residency status, international status, first-generation status, and housing status), academic (type of high school attended, retention outcome, SAT Math and ERW scores, weighted high school GPA, dual enrollment, accelerated credits, and FIU cumulative GPA) and financial (Pell, Bright Futures, State aid, federal aid, other aid, loans, financial aid and EFC range). Table 18 below provides a summary of each cohort's mean SAT Math and ERW scores, high school GPA and FIU GPA.

Table 18

Demographics of Sample Population by Cohort

Cohort	Frequency	Mean SAT Math	Mean SAT ERW	Mean HS GPA	Mean FIU GPA
2010	3937	558	583	3.62	2.76
2011	4475	560	579	3.60	2.79
2012	4347	562	582	3.65	2.80
2013	4523	566	588	3.72	2.86
2014	4144	562	584	3.79	2.92
2015	4187	558	583	3.83	2.93
2016	4506	561	585	3.86	3.05

Q9 – Did the independent variables that were significant in predicting four-year graduation rates change over time?

A logistic regression analysis was run for each cohort for which four-year graduation information was available. In total, seven cohorts were analyzed (2010, 2011, 2012, 2013, 2014, 2015, and 2016). Only four variables were significant ($p < .05$) in predicting whether students graduated in four years across all seven cohorts: gender,

accelerated credits, FIU cumulative GPA and institutional aid. In the past seven years of four-year graduation rates, females, students with accelerated credits and/or institutional aid had increased odds of graduating in four years. In addition, for every unit increase in FIU cumulative GPA, so too increased a student's odds of graduating. Race was significant, with only four cohorts with Hispanic students having increased odds of graduating in four years, while black students had increased odds in 2012 and 2016 and white students had decreased odds in the last three cohorts (2014-2016).

Dual enrollment, although not significant with earlier cohorts, emerged as significant in later cohorts with the odds ratio of graduating in four years increasing for students with dual enrollment. Housing status was also significant in the analysis of six of the seven cohort (2010-2015), with those students who lived in on-campus housing having increased odds of graduating in four years. Lastly, several other predictors were found to be significant with certain cohorts, although significance was sporadic throughout the cohorts. For example, Bright Futures was found to be significant with the 2013, 2014, and 2016 cohorts, while state aid and Pell were only significant with the 2015 cohort and EFC was only significant with the 2014 and 2015 cohorts. The effects of these specific predictors were found to vary significantly over time with respect to their effects on four-year graduation. Lastly, four variables, three of which are financial, were found to have no significance in any of the seven cohorts: retention outcome, Pell, federal aid, and financial aid.

Q10 – Did the independent variables that were significant in predicting six-year graduation rates change over time?

A logistic regression analysis was run for each cohort for which six-year graduation information was available. In total, five cohorts were analyzed (2010, 2011, 2012, 2013, and 2014). Only two variables were found to be significant ($p < .05$) in predicting whether students graduated in six years across all five cohorts: race and FIU cumulative GPA. In the past five years of six-year graduation data, white students had decreased odds of graduating in six years than Hispanic students. Black students also had decreased odds of graduating in six years with the 2010 and 2011 cohorts; however, in 2012, it reversed and Black students had increased odds of graduating over Hispanic students. In addition, for every unit increase in FIU cumulative GPA, the odds of graduating in six-years increased.

Residency status, accelerated credits, and loans were significant in four cohorts, although the cohorts varied for each variable. Residency status and loans were significant with the 2010, 2011, 2013, and 2014 cohorts, while accelerated credits was significant with the 2010, 2012, 2013, and 2014 cohorts. Gender was only significant in three of the five cohorts, 2011, 2013 and 2014, while international status, housing, institutional aid, and Bright Futures were significant for two of five cohorts. International status and institutional aid were significant with the 2013 and 2014 cohorts; housing was significant with the 2010 and 2011 cohorts, while Bright Futures was significant with the 2011 and 2014 cohorts. Lastly, type of high school, SAT Math score, dual enrollment, federal aid, and EFC range were only significant with one cohort each.

Summary

This study analyzed the data of 30,119 students who were part of the 2010-2016 FTIC cohorts in order predict whether they graduated in four or six years. The analysis on

four-year graduation included all 30,119 students in the seven cohorts, while the six-year graduation analysis included 21,426 students in five cohorts. Fifty-four percent of the students in the four-year analysis were female, 69.2% were Hispanic, and the sizes of each cohort were similar, ranging from 3,937 to 4,523. Similarly, 54.6% of students in the six-year graduation analysis were female, 68.8% were Hispanic, and the sizes of each cohort ranged from 3,937 to 4,523. Both analyses included three groups of variables: demographic, academic, and financial. Demographic variables included gender, race/ethnicity, residency status, international student status, first-generation status, and on-campus housing status. Academic variables included type of high school attended, retention outcome, SAT Math and ERW scores, weighted high school GPA, FIU cumulative GPA, dual enrollment, and accelerated test credits. Financial variables included Pell Grant, Bright Futures, institutional aid, federal aid, state aid, financial aid, loans, other aid, and EFC range. A correlations tables was used to determine multicollinearity amongst the independent variables, which resulted in the removal of total SAT score and unweighted high school GPA as independent variables (see Appendix A). There was no significant multicollinearity amongst the rest of the independent variables.

This chapter also provided the results of the binary logistic regression analyses conducted to answer the ten research questions in this study. Both the four- (-2 Log Likelihood = 27344.193, $\chi^2(27) = 10791.696$, $p < .001$) and six-year graduation analyses (-2 Log Likelihood = 19440.375, $\chi^2(27) = 9625.101$, $p < .001$) using all three groups of variables (demographic, academic, and financial) were found to be statistically significant ($p < .001$) in predicting whether students graduated. The four-year model correctly

classified 76.2% of cases and the Negelkerke R^2 indicated that 42% of the unexplained variance was accounted for by the three groups of independent variables. The six-year model correctly classified 79.4% of cases and the Negelkerke R^2 indicated that 48.8% of the unexplained variance was accounted for by the three groups of independent variables. In both models, academic variables accounted for the largest proportion of variance with the number of cases correctly classified. In the four-year model using academic variables alone [-2 Log Likelihood = 27932.327, $\chi^2(9) = 10203.561$, $p < .001$], 75.6% of cases were correctly classified with the Negelkerke R^2 indicating that 40.1% of the unexplained variance was accounted for by academic variables. Similarly, in the six-year model using academic variables alone [-2 Log Likelihood = 19705.928, $\chi^2(9) = 9359.548$, $p < .001$], 79.1% of cases were correctly classified, with the Negelkerke R^2 indicating that 47.7% of the unexplained variance was accounted for by academic variables. Lastly, results showed that variables predicting four- and six-graduation changed over time.

CHAPTER V

DISCUSSION

This study was designed to answer two overarching questions. The first sought to determine whether demographic (race/ethnicity, gender, residency status, international status, first-generation status, and on-campus housing status), academic (type of high school, weighted high school GPA, dual enrollment, accelerated test credits, SAT Math and ERW scores, retention outcome, and FIU cumulative GPA) and financial (federal aid, state aid, institutional aid, Bright Futures, Pell Grant, financial aid, loans, EFC range) variables significantly predicted four-year graduation. The second question was similar to the first, but questioned whether those same variables were significant in predicting six-year graduation. The results for this study supported my hypothesis for the two overarching questions: demographic, academic, and financial variables significantly predict four- and six-year graduation of FTIC students who entered FIU between 2010 and 2016.

The study utilized two dichotomous dependent variables that indicated whether or not a student graduated in four years and whether or not a student graduated in six years. Each dependent variable was used to answer five of ten questions. The analyses using the four-year dependent variable was used to respond to Q1, Q3-Q5, and Q9, while the six-year dependent variable was used to respond to Q2, Q6-Q8, and Q10. In total, 22 predictor variables, grouped into three categories (demographic, academic, and financial) were analyzed using a binary logistic regression. The first analysis, using the four-year graduation dependent variable, was first run using all three groups of independent variables and then again with each group of independent variables individually to

determine if any one group was more significant in predicting four-year graduation. The same analysis was then repeated using the six-year graduation dependent variable and the same three groups of independent variables (demographic, academic, and financial) to determine if those variables were significant in predicting six-year graduation. The following ten questions were developed to conduct and test the hypothesis that demographic, academic, and financial variables significantly predicted whether FTIC students at FIU graduated in four or six years.

Q1 - Do demographic, academic, and financial factors significantly help predict whether first-time-in-college students graduate in four years?

Q2 - Do demographic, academic, and financial factors significantly help predict whether first-time-in-college students graduate in six years?

Q3 - Do demographic factors better predict four-year graduation for first-time-in-college students than academic and financial factors?

Q4 - Do academic factors better predict four-year graduation for first-time-in-college students than demographic and financial factors?

Q5 - Do financial factors better predict four-year graduation for first-time-in-college students than demographic and academic factors?

Q6 - Do demographic factors better predict six-year graduation for first-time-in-college students than academic and financial factors?

Q7 - Do academic factors better predict six-year graduation for first-time-in-college students than demographic and financial factors?

Q8 - Do financial factors better predict six-year graduation for first-time-in-college students than demographic and academic factors?

Q9 - Did the independent variables that were significant in predicting four-year graduation rates change over time?

Q10 - Did the independent variables that were significant in predicting six-year graduation rates change over time?

In total, the data for 30,179 FTIC students who entered FIU between 2010 and 2016 were reviewed. After removing duplicates and students missing data for both weighted high school GPA and SAT/ACT scores, the total number of students remaining in the sample was 30,119, from seven different cohorts. Data from the students in all seven cohorts (2010-2016) were utilized for the analysis on four-year graduation; however, the six-year graduation analysis only included data from five of the seven cohorts (2010-2014) due to six-year graduation data not being available for the 2015 and 2016 cohorts; therefore, the sample population for the six-year graduation analysis included the data for 21,426 students. As discussed in Chapter IV, the models utilized to answer Q1 and Q2 included all independent variables, while the models to answer Q3-Q8 added each group of independent variables in blocks to determine their significance, if any, as compared to the other groups of independent variables. All overall regression models run for Q1-Q2 were found to be statistically significant ($p < .05$), indicating that demographic, academic and financial variables significantly predict four- and six-year graduation. The four-year model including all groups of independent variables increased the number of cases correctly classified by almost 10% than the model without the variables. Conversely, the six-year model increased the number of cases correctly classified by 20.3%. The models conducted with each group of independent variables were also found to be statistically significant, although academic variables had the largest

effect in predicting four- and six-year graduation, increasing the number of correct cases classified by 11 percent.

In addition to the models conducted for Q1-Q8, one model per cohort year per dependent variable using all groups of independent variables were conducted to answer Q9-Q10 and determine if significant variables changed over time. In the four-year models, only four variables were found to be significant across all cohorts (race/ethnicity, gender, accelerated credits and institutional aid), while other independent variables were statistically significant in some cohorts and not others. The models using six-year graduation only found two independent variables (race and FIU cumulative GPA) that were consistently significant with all five cohorts analyzed. Like in the four-year models, the remaining independent variables were statistically significant in some cohorts and not others.

Interpretations of Findings

Ten research hypotheses were developed for this study to determine if three groups of independent variables (demographic, academic, and financial) had any relationship to predicting whether a student graduated in four- or six-years. A series of binary logistic regression analyses were conducted to answer the ten research questions. The data for the results of these analyses were presented in detail in Chapter IV; however, a summary of the results for each research hypothesis will also be presented in this section, as well as an interpretation of what the results signify.

RH1: Demographic, academic, and financial factors significantly predict if first-time-in-college students graduate in four years.

The results of the overall binary logistic regression analysis using four-year graduation as the dependent variable and all three groups of independent variables (demographic, academic, and financial) was statistically significant in predicting whether students graduated in four years or not (-2 Log Likelihood = 27344.193, $\chi^2(27) = 10791.696, p<.001$); therefore, the results support the first research hypothesis of this study. The model that included the three groups of independent variables resulted in an increase of the percent of cases correctly classified from 66.9% to 76.2%, an increase of 9.3 percent. In addition, the -2 Log Likelihood decreased by a value of 10791.696 after including the demographic, academic and financial predictor variables, which indicates that the three groups of predictor variables accounted for a significant amount of unexplained variance in the overall model. Furthermore, the Negelkerke R^2 indicated that 42% of the variance in four-year graduation is explained by demographic, academic, and financial variables.

These results support the use of the three groups of variables in predicting whether a student graduates in four years. They also support the literature related to the importance of academic preparation (Astin, 1993; Geiser and Santelices, 2004; Klopfenstein, 2010; Hofmann, 2012; Cook, 2013; and Karp, 2015), as well as the importance of financial aid on college access and completion (Wilcox, 1991; Astin, 1993; Perna and Titus, 2004; Heller, 2004; St. John, et al., 2005; Hoffman, et al., 2008).

RH2: Demographic, academic, and financial factors significantly predict if first-time-in-college students graduate in six years.

The results of the overall binary logistic regression analysis using six-year graduation as the dependent variable and all three groups of independent variables

(demographic, academic, and financial) was statistically significant in predicting whether students graduated in six years or not (-2 Log Likelihood = 19440.375, $\chi^2(27)$ = 9625.101, $p < .001$); therefore, the results support the second research hypothesis of this study. The model that included the three groups of independent variables resulted in an increase of the percent of cases correctly classified from 58.1% to 79.4%, an increase of 21.3 percent. In addition, the -2 Log Likelihood decreased by a value of 9625.101 after including the demographic, academic and financial predictor variables, which indicates that the three groups of predictor variables accounted for a significant amount of unexplained variance in the overall model. Furthermore, the Negelkerke R^2 indicated that 48.8% of the variance in six-year graduation is explained by demographic, academic, and financial variables.

In line with the results for the first research question, these results also support the use of the three groups of variables in predicting whether a student graduates in six years. Furthermore, they also support the literature related to the importance of academic preparation (Astin, 1993; Geiser and Santelices, 2004; Klopfenstein, 2010; Hofmann, 2012; Cook, 2013; and Karp, 2015), as well as the importance of financial aid on college access and completion (Wilcox, 1991; Astin, 1993; Perna and Titus, 2004; Heller, 2004; St. John, et al., 2005; Hoffman, et al., 2008).

RH3: Demographic factors (race/ethnicity, gender, residency status, international status, first-generation status, and on-campus housing status) better predict four-year graduation for first-time-in-college students than academic and financial factors.

The results of the binary logistic regression analysis using four-year graduation as the dependent variable and only demographic independent variables (race/ethnicity,

gender, residency status, international status, first-generation status, and on-campus housing status) was statistically significant in predicting whether students graduated in four years or not (-2 Log Likelihood = 36861.084, $\chi^2(9) = 1274.805$, $p < .001$); however, when comparing the percentage of cases correctly classified by the model without any variables to the model with demographic variables, they both correctly classified 66.9% of cases, indicating that demographic variables do not add a lot of value to the model. Furthermore, the Negelkerke R^2 indicated that only 5.8% of the variance in four-year graduation is explained by demographic variables.

When comparing the results of the model using demographic variables to the models using academic and financial variables, each which were statistically significant ($p < .001$) and correctly classified 75.9% and 67.9% of cases, respectively, demographic variables were less reliable in predicting whether a student graduated in four years than academic and financial variables. These results do not support the research hypothesis that demographic variables better predict four-year graduation for first-time-in-college students over academic and financial variables. However, due to their statistical significance, these results support the use of demographic variables in models predicting whether a student will graduate in four years, but not the use of solely demographic variables.

These results support some aspects of the literature related to racial inequalities in college completion rates, but not others (Astin, 1993; O'Brien and Zudak, 1998; Ward, 2006; and Bergerson, 2009). All of these studies discuss the lower completion rates of underrepresented students when compared to Whites and Asians. Although the results of this study support those findings as it relates to the graduation rates of Blacks and Asians,

it does not support that of Whites graduating at a higher rate than Hispanics. These results also support studies conducted by Hallinan (1998) and Goldsmith (2011) that found that underrepresented students attending universities with more diverse students, faculty, and staff, perform better than their peers attending less diverse universities.

RH4: Academic factors (cohort year, type of high school attended, accelerated credits, weighted high school GPA, unweighted high school GPA, FIU GPA, SAT/ACT scores), better predict four-year graduation for first-time-in-college students over demographic and financial factors.

The results of the binary logistic regression analysis using four-year graduation as the dependent variable and only academic independent variables (cohort year, type of high school attended, accelerated credits, weighted high school GPA, unweighted high school GPA, FIU GPA, SAT/ACT scores) was statistically significant in predicting whether students graduated in four years or not (-2 Log Likelihood = 27932.327, $\chi^2(9) = 10203.561$, $p < .001$). When comparing the percentage of cases correctly classified by the model without any variables, 66.9%, to the model with academic variables, 75.6%, the model which included the academic variables performed better and correctly classified 8.7% more cases than the model without any variables. Furthermore, the Negelkerke R^2 indicated that 40.1% of the variance in four-year graduation is explained by academic variables, which is higher than the 5.8% that were explained by demographic variables.

When comparing the results of the model using academic variables to the models using demographic and financial variables, each which were also statistically significant ($p < .001$) and correctly classified 66.9% and 67.9% of cases, respectively, academic variables were more reliable in predicting whether a student graduated in four years than

were demographic and financial variables. In fact, the overall model that included all three groups of variables only increased the percentage of cases correctly classified by .6% when compared to the model using only academic variables, indicating that academic variables alone are a good predictor of four-year graduation. Moreover, when looking at the significance of each individual academic variable, all were statistically significant in predicting four-year graduation, with the exception of retention outcome, weighted high school GPA, and SAT ERW score. These results support the research hypothesis that academic variables better predict four-year graduation for first-time-in-college students over demographic and financial variables.

The results found in the analysis to test this hypothesis supports the literature regarding college preparedness and dual enrollment, but not all of the literature related to college preparedness, college admissions exams (SAT/ACT), and accelerated test programs such as AP (Astin, 1993; Schuh, 1999; Geiser and Santelices, 2004; Bowen, et al., 2009; Bok, 2013; Cook, 2013; Klopfenstein, 2010; Hoffman, 2012; Karp, 2015, Allensworth and Clark, 2020; Buckley, et al., 2020). Although some the literature states that high school GPA and SAT/ACT test scores are good predictors of college success (Astin, 1993; Allensworth and Clark, 2020), the results for this study found that weighted high school GPA was significant and SAT Math scores were significant in predicting four-year graduation; however, SAT ERW scores were not significant, which support studies by Schuh (1999) and Bowen, et al. (2009). Also, both dual enrollment and accelerated test credits were found to be significant in predicting four-year graduation, which supports the literature from Geiser and Santelices (2004), Hoffman (2012), Buckley, et al. (2020), and Cook (2013), but not Klopfenstein (2010), which found no

relation between AP courses and college completion, although she found a positive correlation between dual enrollment and college completion.

RH5: Financial factors (federal aid, state aid, institutional aid, financial aid, loans, and Estimated Family Contribution), better predict four-year graduation for first-time-in-college students than demographic and academic factors.

The results of the binary logistic regression analysis using four-year graduation as the dependent variable and only financial independent variables (federal aid, state aid, institutional aid, financial aid, loans, and Estimated Family Contribution) was statistically significant in predicting whether students graduated in four years or not (-2 Log Likelihood = 36863.614, $\chi^2(9) = 1440.24$, $p < .001$); however, when comparing the percentage of cases correctly classified by the model without any variables to the model with financial variables, the number of cases correctly classified only increased by 1% from 66.9% to 67.9%, indicating that financial variables do not add a lot of value to the model. Furthermore, the Negelkerke R^2 indicated that only 6.3% of the variance in four-year graduation is explained by financial variables.

When comparing the results of the model using financial variables to the models using demographic and academic variables, each of which were statistically significant ($p < .001$) and correctly classified 66.9% and 75.9% of cases, respectively, financial variables were more reliable in predicting whether a student graduated in four years than demographic variables, but less reliable than academic variables. These results do not support the research hypothesis that financial variables better predict four-year graduation for first-time-in-college students over demographic and academic variables. However, due to their statistical significance, these results support the use of financial variables in

models predicting whether a student will graduate in four years, but not the use of only financial variables. When looking at the statistical significance of the financial variables independently, all were significant, with the exception of Bright Futures, Florida's merit-based scholarship. When looking at the effects of the variables that were statistically significant, federal aid and loans had a negative effect on four-year graduation, while the rest had positive effects.

Most of the literature on the effects of financial aid on college completion use six-year graduation as the benchmark; however, these results support the study conducted by Goldrick-Rab, et al. (2016) who found that students who received a private, need-based grant in Wisconsin had higher four-year graduation rates than non-recipients. In addition, one could argue that it also supports studies conducted by Heller (1999), Kane (2003), and Linsenmeier, et al. (2006), which found that financial aid has a positive effect on college enrollment and persistence, which is ultimately needed for completion. As mentioned in Chapter III, the research regarding financial aid and college completion is limited; and those that look at four-year graduation is even more limited.

RH6: Demographic factors (race/ethnicity, gender, residency status, international student status, first-generation status, and on-campus housing status) better predict six-year graduation for first-time-in-college students than academic and financial factors.

The results of the binary logistic regression analysis using six-year graduation as the dependent variable and only demographic independent variables (race/ethnicity, gender, residency status, international status, first-generation status, and on-campus housing status) was statistically significant in predicting whether students graduated in six years or not (-2 Log Likelihood = 28.268.144, $\chi^2(9) = 797.332$, $p < .001$). When

comparing the percentage of cases correctly classified by the model without any variables, 58.1%, to the model with demographic variables, 60.5%, the model which included the demographic variables performed slightly better and correctly classified 2.4% more cases. Furthermore, the Negelkerke R^2 indicated that only 4.9% of the variance in six-year graduation is explained by demographic variables.

When comparing the results of the model using demographic variables to the models using academic and financial variables, each which were statistically significant ($p < .001$) and correctly classified 79.1% and 60.3% of cases, respectively, demographic variables were slightly more reliable in predicting whether a student graduated in six years than financial variables, but less reliable than academic variables. These results do not support the research hypothesis that demographic variables better predict six-year graduation for first-time-in-college students over academic and financial variables. However, due to their statistical significance, these results support the use of demographic variables in models predicting whether a student will graduate in six years, but not the use of only demographic variables.

Again, these results support some aspects of the literature related to racial inequalities in college completion rates, but not others (Astin, 1993; O'Brien and Zudak, 1998; Ward, 2006; and Bergerson, 2009). All of these studies discuss the lower completion rates of underrepresented students when compared to Whites and Asians. Although the results of this study support those findings as it relates to the graduation rates of Blacks and Asians, with Blacks graduating at a lower rate and Asians graduating at a higher rate than Whites, it does not support that of Whites graduating at a higher rate than Hispanics. These results also support studies conducted by Hallinan (1998) and

Goldsmith (2011) that found that underrepresented students attending universities with more diverse students, faculty, and staff, perform better than their peers attending less diverse universities.

RH7: Academic factors (cohort year, type of high school attended, accelerated credits, weighted high school GPA, unweighted high school GPA, FIU GPA, SAT/ACT scores), better predict six-year graduation for first-time-in-college students than demographic and financial factors.

The results of the binary logistic regression analysis using six-year graduation as the dependent variable and only academic independent variables (cohort year, type of high school attended, accelerated credits, weighted high school GPA, unweighted high school GPA, FIU GPA, SAT/ACT scores) was statistically significant in predicting whether students graduated in six years or not (-2 Log Likelihood = 19705.928, $\chi^2(9) = 9359.548$, $p < .001$). When comparing the percentage of cases correctly classified by the model without any variables, 58.1%, to the model with academic variables, 79.1%, the model which included the academic variables performed better and correctly classified 21% more cases than the model without any variables. Furthermore, the Negelkerke R^2 indicated that 47.7% of the variance in six-year graduation is explained by academic variables, which is higher than the 4.9% that was explained by demographic variables.

When comparing the results of the model using academic variables to the models using demographic and financial variables, each of which were also statistically significant ($p < .001$) and correctly classified 60.5% and 60.3% of cases, respectively, academic variables were more reliable in predicting whether a student graduated in six years than were demographic and financial variables. In fact, the overall model that

included all three groups of variables only increased the percentage of cases correctly classified by .4 % when compared to the model using only academic variables. These results support the research hypothesis that academic variables better predict six-year graduation for first-time-in-college students over demographic and financial variables.

The results found in the analysis to test this hypothesis supports the literature regarding college preparedness and dual enrollment, but not all of the literature related to college preparedness, college admissions exams (SAT/ACT), and accelerated test programs such as AP (Astin, 1993; Schuh, 1999; Geiser and Santelices, 2004; Bowen, et al., 2009; Bok, 2013; Cook, 2013; Klopfenstein, 2010; Hoffman, 2012; Karp, 2015; Allensworth and Clark, 2020; Buckley, et al., 2020). Although some the literature states that high school GPA and SAT/ACT test scores are the best predictors of college success (Astin, 1993; Allensworth and Clark, 2020), the results of this study found that weighted high school GPA was not significant in predicting six-year graduation, although SAT scores, both Math and ERW, were significant, contradicting studies by Schuh (1999) and Bowen, et al. (2009). Also, both dual enrollment and accelerated test credits were also found to be significant in predicting six-year graduation, which supports the literature from Geiser and Santelices (2004), Hoffman (2012), Buckley, et al. (2020), and Cook (2013), but not Klopfenstein (2010), which found no relation between AP courses and college completion, although she did find a positive correlation between dual enrollment and college completion.

RH8: Financial factors (federal aid, state aid, institutional aid, and Estimated Family Contribution), better predict six-year graduation for first-time-in-college students than demographic and academic factors.

The results of the binary logistic regression analysis using six-year graduation as the dependent variable and only financial independent variables (federal aid, state aid, institutional aid, financial aid, loans, and Estimated Family Contribution) was statistically significant in predicting whether students graduated in four years or not (-2 Log Likelihood = 28351.416, $\chi^2(9) = 714.060$, $p < .001$); however, when comparing the percentage of cases correctly classified by the model without any variables to the model with financial variables, the number of cases correctly classified only increased by 2.2% from 58.1% to 60.3%, indicating that financial variables do not add a lot of value to the model. Furthermore, the Negelkerke R^2 indicated that only 4.4% of the variance in six-year graduation is explained by financial variables.

When comparing the results of the model using financial variables to the models using demographic and academic variables, each which were statistically significant ($p < .001$) and correctly classified 60.5% and 79.1% of cases, respectively, financial variables were less reliable in predicting whether a student graduated in six years than demographic and academic variables. These results do not support the research hypothesis that financial variables better predict six-year graduation for first-time-in-college students over demographic and academic variables. However, due to their statistical significance, these results support the use of financial variables in models predicting whether a student will graduate in six years, but not the use of only demographic variables. When looking at the statistical significance of the financial variables independently, all were significant, with the exception of state aid and loans. When looking at the effects of the variables that were statistically significant, only federal aid had a negative effect on six-year graduation, while the rest had positive effects.

These results support the literature regarding financial aid and its effect on college completion. Studies conducted by Castleman and Long (2016) and Denning (2019), looking at the impact a specific type of aid had on college completion, both found positive effects between receiving the aid and graduating in six years. These results, however, do not support a study by Ishitani (2020) that concluded that Pell grant recipients had lower graduation rates than non-Pell recipients; however, they support the study by Eng and Matsudaira (2021) who found a small positive effect on college completion for Pell grant recipients, but also suspected that the effect of the Pell grant on completion rates could vary by state and institution. In addition, one could argue that it also supports studies conducted by Heller (1999), Kane (2003), and Linsenmeier, et al. (2006), which found the financial aid has a positive effect on college enrollment and persistence, which is ultimately needed for completion. As mentioned in Chapter III, the research regarding financial aid and college completion is limited – and those that look at four-year graduation is even more limited.

RH9: Demographic, academic and financial variables that were significant in predicting four-year graduation rates changed over time.

A binary logistic regression was conducted on each of the seven cohorts using four-year graduation as the dependent variable and all three groups of independent variables (demographic, academic, and financial). Each model yielded the significance value of all independent variables for each cohort year (see Appendix B). Using $p < .05$ for significance, the significance value for all independent variables was compared from cohort to cohort. Results showed that one demographic variable, two academic variables, and one financial variable were significant in predicting four-year graduation across all

seven cohorts: gender, accelerated credits, FIU cumulative GPA, and institutional aid. Four additional variables, three of which are financial and one academic variable, were not significant in any of the seven cohorts: retention outcome, Pell, federal aid, and financial aid. The remaining variables were significant in some years, but not others. These results support the research hypothesis that demographic, academic, and financial variables that predict four-year graduation change over time.

These results support the literature that highlight the importance of demographic, academic and financial variables in predicting college completion (Astin, 1993; Geiser and Santelices, 2004; Klopfenstein, 2010; Hofmann, 2012; Cook, 2013; and Karp, 2015), as well as the importance of financial aid on college access and completion (Wilcox, 1991; Astin, 1993; Perna and Titus, 2004; Heller, 2004; St. John, et al., 2005; Hoffman, et al., 2008), although none of these address how the impact of these variable may change over time.

RH10: Demographic, academic, and financial variables that were significant in predicting six-year graduation rates changed over time.

A binary logistic regression was conducted on the five cohorts for which six-year graduation was available. Using six-year graduation as the dependent variable and all three groups of independent variables (demographic, academic, and financial), the significance value of all independent variables for each cohort year was compared (see Appendix C). Using $p < .05$ for significance, results showed that one demographic variable and one academic variable were significant in predicting six-year graduation across all five cohorts: race and FIU cumulative GPA. In addition, one demographic variable (retention outcome), one academic variable (weighted high school GPA), and

four financial variables (Pell, state aid, other aid, and financial aid) were not significant in predicting six-year graduation in any of the five cohorts. However, the remaining variables were significant in some years, and not others. For example, one demographic (residency status), one academic (accelerated credits), and one financial (loans), were significant in predicting six-year graduation in four of the five cohorts, while EFC range was only significant in one cohort. These results support the research hypothesis that demographic, academic, and financial variables that predict six-year graduation change over time.

Like with the previous research question, these results support the literature that highlight the importance of demographic, academic, and financial variables in predicting college completion (Astin, 1993; Geiser and Santelices, 2004; Klopfenstein, 2010; Hofmann, 2012; Cook, 2013; and Karp, 2015), as well as the importance of financial aid on college access and completion (Wilcox, 1991; Astin, 1993; Perna and Titus, 2004; Heller, 2004; St. John, et al., 2005; Hoffman, et al., 2008), although none of these address how the impact of these variables may change over time.

Limitations

Assumptions and choices were made in conducting this research that may limit the ability for this study to generalize its results; therefore, this section reviews the limitations of this study. First, this study only analyzed students at one specific large, urban, public, four-year, Hispanic-serving institution in South Florida that enrolls the largest number of Hispanic students in the U.S. As such, findings in this study should not be generalized toward students attending other institutions, including other HSIs, since their characteristics may vary. That said, educators and researchers may be able to apply

the results of this study at institutions with similar demographics. Secondly, this study only analyzed the data of students admitted as first-time-in-college (FTIC) students during the summer and fall semesters, which are the two semesters with the largest number of FTIC applicants and admits. The results of this study; therefore, should not be generalized toward other FTIC students admitted in other semesters. In addition, these results should not be generalized to non-FTIC, such as transfer students, regardless of semester admitted. It is also important to note that this study only included graduation data from the institution where the sample population was drawn; therefore, it is possible that some students who were coded as not graduating did in fact graduate from another institution.

The sample used in this study included students admitted between 2010 and 2016, for which the latest graduation data was available. Although the results of this study can be generalized toward FTIC students at the same institution for cohorts beyond 2016, it is important to keep in mind that policies and procedures are constantly changing and may impact the effects of some of the variables used in this study. For example, the requirements of the Bright Futures scholarship in Florida has had its requirements changed several times over the last decade, and will once again have new requirements in the 2021-2022 academic year. The institution has also changed policies and implemented initiatives that can impact a student's time to graduation. For example, limiting the number of times a student can change their major or number of minors a student is able to declare.

Lastly, there are several factors, both qualitative (peer and family influence, etc.) and quantitative (demographic, academic, financial, etc.), that can impact a student's

ability to graduate. This study only considered specific demographic, academic, and financial quantitative variables. Furthermore, with regard to most demographic, academic, and financial variables analyzed, this study only looked at whether the student pertained to a group or not and did not look at details. For example, for housing status, it only identified if the student lived in housing their first year, not how long; therefore, generalizations should not be made with regard to any individual variable.

Implications for Research

There is a wealth of research available on college completion and, similar to this study, they all seek to find the magic formula that results in a student earning a college degree. However, unlike the college completion research analyzed in this paper, this study also considered how the significance of variables used to predict graduation can change over time, even within the same cohort. As mentioned previously in this chapter, several studies point to high school GPA and SAT/ACT scores as the biggest predictors of college completion. However, those studies primarily used the composite (total) score of those exams (Astin, 1993; Allensworth and Clark, 2020). Instead of utilizing total SAT and ACT composite scores, this study utilized the scores for the two sections that make up the composite score, Math and ERW. This provided an additional lens to understanding the effects and significance of each section on graduation rates and found that although SAT/ACT scores were significant in predicting six-year graduation, they were not significant in predicting four-year graduation.

As noted in Chapter II, the research studies available on the effects of financial aid on college completion are limited (Castleman & Long, 2016; Goldrick-Rab, S., Kelchen, Harris, & Benson, 2016; Denning, 2019). Although this study did not focus on

just financial aid, it did provide some insight into the significance of different types of aid on four- and six-year completion. These insights can provide some guidance for researchers who are interested in studying financial aid and completion.

Lastly, this study contributes to the literature on the completion rates of Hispanic students. Two studies conducted by Goldsmith (2011) and Hallinan (1998) found that underrepresented students who attend universities that have a more diverse student body, faculty, and staff, perform better than their peers attending less diverse institutions. Although this study did not examine the diversity of faculty and staff, the diversity of the student body is highlighted. The institution from which the sample population was pulled is the public, four-year institution that currently enrolls and awards the most bachelor's degrees to Hispanic students. As such, results indicated that White students have lower odds of graduating in four or six years than Hispanic students. Given this institution's success in awarding degrees to Hispanic students, these results may provide some understanding to other institutions with similar demographics who are looking to identify predictors to graduation.

Implications for Practice

The overall results for this study have several implications for practice that should be considered by higher education administrators who are focused on improving student success, specifically retention and graduation, as well as policy makers focused on a college completion agenda. First, much of the literature regarding financial aid suggests that the availability of need-based grants have a positive impact on the college enrollment and completion of underrepresented students (Wilcox, 1991; Astin, 1993; Perna and Titus, 2004; Heller, 2004; St. John, et al., 2005; Hoffman, et al., 2008). The results of this

study, also confirm that. Given the large number of Hispanics in the state and it housing the two institutions in the U.S. with the largest number of Hispanics enrolled, Miami-Dade College and Florida International University, state policy makers should explore ways to expand the Florida Student Access Grant, the state's need-based program, which according to research from Castleman and Long (2016) increased the probability of the students in their study earning a bachelor's degree by almost 4 percentage points. The results of the study by Castleman and Long are promising and if similar results are found with later cohorts than those analyzed by their study, then expanding the FSAG program has a high potential of yielding significant increase in degrees awarded to underrepresented and low-income students.

Second, the results comparing statistically significant predictors of four- and six-year graduation found that significant predictors changed with every cohort. In fact, only four predictors were significant with every cohort for the four-year graduation rate, while only two predictors were significant in every cohort for six-year graduation. Furthermore, not only were predictors that were significant differ cohort to cohort within the four- and six-year analysis, but they also differed within the same cohort when comparing four- and six-year graduation. In other words, variables that were significant in predicting four-year graduation for one cohort, were not the same variables that were significant in predicting six-year graduation for that same cohort. As universities work toward building models that help predict graduation rates, as well as identify students "at-risk" of not graduating on time, these results suggest that relying on one predictive model to assess four- and six-year graduation may limit the model's efficacy.

Lastly, this study found that demographic, academic, and financial data are statistically significant in predicting four- and six-year graduation, but it was the academic variables groups that increased the efficacy of the overall models significantly. In contrast, this study also found some evidence to contradict the research that coin high school GPA and SAT/ACT scores as the best predictors of college success. That said, it is evident that academic preparation, in general, is strongly linked to success in college. More specifically, this study found that accelerated programs that offer students the rigor and experience of taking a college level course, seem to have a positive impact on the college completion rates of students who completed them, especially with dual enrollment programs. Understanding that some schools, specifically those located in less affluent areas, may have fewer resources, it would be prudent for universities to form partnerships with local school districts in an effort to expand dual enrollment programs to schools with high percentages of low-income students.

Recommendations for Future Research

This study focused three groups of quantitative variables, demographic, academic, and financial. All variables, with the exception of high school GPA, FIU cumulative GPA, and SAT scores, were converted to dichotomous variables indicating the presence or absence of that variable. Although for this study it provided useful information across the three categories, there are two recommendations to consider for future research. First, regarding accelerated credits this study only analyzed whether the student had them or not. It is my recommendation that future research in this area include the number of credits that students earned via AP/IB programs, as well as dual enrollments. Second, regarding financial aid this study only analyzed whether the student had aid or not. This

was the case with all types of aid considered in the study. Including the amount of aid received by the student by type of aid may also provide another layer of information to help improve the predictive models for four- and six-year graduation. Given the limited research in the area of financial aid and completion, this may provide a more in-depth insight into how different types of aid and the amount of aid can affect four- and six-year graduation. Furthermore, I recommend adding socioeconomic status as a variable. Much of the research available with regard to students from underrepresented groups and low-income students suggests that a student's socioeconomic status can impact preparation for college, access, persistence and completion; therefore, including it in the study can prove to be useful and strengthen the predictive model.

This study also used weighted high school GPA instead of unweighted GPA, due to its use in admission eligibility at FIU; however, much of the research evaluated for this study used unweighted GPA in predicting college completion. Future analysis should consider the use of unweighted GPA to determine if it better predicts graduation. With regard to the FIU cumulative GPA, the GPA used in the study was the student's last available GPA, regardless of number of credits. It is my recommendation that in future studies either the first-year GPA or total number of earned credits be used to better analyze the effects of GPA and completion. In addition, the results of this study found that variables that were significant in predicting four- and six-year graduation changed with every cohort. More research would need to be done to determine the differences between the cohorts, including changes in policies and practice that may impact one cohort, but not another, because of when they were implemented. Also, it would be fruitful to further analyze and compare the data of students who graduate in 4 years,

students who graduate in 6 years, and those who do not graduate to see if there are commonalities and differences in the characteristics of those groups.

Also, this study focused solely on quantitative factors to measure their significance in predicting four- and six-year graduation; however, many other influences and variables can impact a student's ability to graduate in four- or six years. A mixed methods study that incorporates the quantitative measures used in this study, along with a qualitative analysis, may uncover additional barriers and challenges not evident through quantitative data. Educators and researchers may want to explore additional quantitative factors, as well as qualitative factors that impact degree completion. Lastly, this study only coded students as "graduated" if they completed their degree from the institution from where the data was drawn. In persistence and retention studies there may be an underlying assumption that evidence of not having graduated from a particular institution is also evidence of not having graduated at all. But there may be students who do not graduate from FIU but transferred to another institution and completed their degree somewhere else. It is my recommendation for future studies that, if accessible, persistence data for students who may have transferred and completed their degree elsewhere be included in studies of four- and six-year graduation.

Summary and Conclusions

This study sought out to answer ten research questions related to four- and six-year graduation. In reviewing the results of the analyses conducted to answer those questions, there are a few conclusions to address. First, the use of demographic, academic, and financial variables resulted in statistically significant models in predicting graduation for both four-year and six-year graduation. Binary logistic regression models

were conducted and the -2 Log Likelihood, Chi-Square model, and Negelkerke's R^2 were utilized to test whether demographic, academic, and financial variables were significant in predicting whether a sample of 30,119 students graduated in four-years and a sample of 21,426 graduated in six-years. All students utilized in the samples were FTIC students admitted in the summer or fall between 2010 through 2016.

In addition to the significance of the overall model using demographic, academic, and, financial variables, analyses were run to measure the significance of each groups of independent variables on four- and six-year graduation rates. When tested individually, all three groups, demographic, academic and financial, were found to be statistically significant in predicting four- and six-year graduation. That said, academic variables accounted for the highest amount of variance in both the four- and six-year analysis. The ability of the model to predict whether a student graduated in four- or six-years was improved by 8.7% and 22%, respectively, when academic variables were included. Moreover, although demographic and financial variables were also statistically significant, the improvement they added to the model in predicting graduation were none to less than 2.5% for both the four- and six-year models.

The results of this study supported existing literature related to the importance of academic preparation (Astin, 1993; Geiser and Santelices, 2004; Klopfenstein, 2010; Hofmann, 2012; Cook, 2013; and Karp, 2015) and added to the limited literature available on financial aid and its impact on completion (Wilcox, 1991; Astin, 1993; Perna and Titus, 2004; Heller, 2004; St. John, et al., 2005; Hoffman, et al., 2008). That said, there were several limitations noted regarding this study and the generalization of the results. Those included limitations related to the sample in that they all attended the same

HSI and all were FTIC students between 2010 and 2016. Furthermore, this study only considered quantitative variables to predict four- and six-year graduation and did not take into account other factors that can influence college completion.

Lastly, this study noted several implications for research and practice. First, although the focus of this analysis was not financial aid, its finding contributes to literature on the effect of financial aid on completion. Also, since the study analyzed the data of students at an HSI, other institutions with similar demographics can gain an understanding of demographic, academic, and financial predictors of four- and six year graduation. Furthermore, regarding implications for practice, this study supports the literature on financial aid's impact on college completion and policy makers should consider expanding its need-based focus, which has shown to have positive effects on graduation rates. In addition, dual enrollment programs have proven to be very beneficial in helping ease a student's transition to college, as well as completion. Expanding dual enrollment partnerships into schools with less access to them, may result in more underrepresented, low-income students opting to pursue a college degree and completing.

As previously mentioned in this chapter, there is significant research available on college completion and, like this study, they all seek to find the magic formula that results in a student earning a college degree. Although this study does not provide that formula, it is my hope that it provides a deeper understanding of the variables that can impede or facilitate a student's ability to graduate so that barriers that impede graduation can continue to be addressed.

APPENDICES

Appendix A: Correlations Table

Appendix B: Table comparing change in significance of variables (four-year graduation)

Appendix C: Table comparing change in significance of variables (six-year graduation)

Appendix A: Correlations Table

		Asian	Black	Hispanic	Other Race	White	Gender	Residency	International	First Gen	Housing	Public HS	Private HS	Other HS	Retention	SAT Total	SAT Math	SAT ERW	Unweighted HS GPA	Weighted HS GPA	Dual Enrollment	Test Credits	Pell	FIU CUM GPA	Bright Futures	Institutional Aid	State Aid	Federal Aid	Other Aid	Loans	Financial Aid
Asian	Pearson Correlation	1	-.063**	-.267**	-.050**	-.057**	0.000	.020**	-.032**	-0.010	0.010	.043**	-.041**	-.016**	.017**	.039**	.066**	0.006	-.012*	.057**	-.023**	.030**	0.007	.032**	.034**	0.009	.026**	-.019**	0.002	-.043**	-0.001
	Sig. (2-tailed)		0.000	0.000	0.000	0.000	0.953	0.000	0.000	0.084	0.099	0.000	0.000	0.005	0.003	0.000	0.000	0.333	0.042	0.000	0.000	0.000	0.243	0.000	0.000	0.125	0.000	0.001	0.765	0.000	0.920
	N	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30113	30113	30113	30119	30040	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119
Black	Pearson Correlation	-.063**	1	-.530**	-.100**	-.112**	.025**	0.004	-.063**	.034**	.294**	.077**	-.091**	-.012*	0.003	-.149**	-.123**	-.124**	-0.007	-.115**	-.050**	-.083**	0.006	-.137**	-.074**	.047**	-.017**	.161**	.103**	.202**	.083**
	Sig. (2-tailed)	0.000		0.000	0.000	0.000	0.000	0.539	0.000	0.000	0.000	0.000	0.000	0.039	0.602	0.000	0.000	0.000	0.248	0.000	0.000	0.000	0.318	0.000	0.000	0.000	0.004	0.000	0.000	0.000	0.000
	N	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30113	30113	30113	30119	30040	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119
Hispanic	Pearson Correlation	-.267**	-.530**	1	-.424**	-.478**	-0.008	.242**	-.267**	.040**	-.371**	-0.006	.102**	-.083**	-.014*	.061**	.018**	.077**	.013*	.097**	.139**	.102**	.091**	.085**	.120**	-.013*	.105**	.031**	-.100**	-.056**	.066**
	Sig. (2-tailed)	0.000	0.000		0.000	0.000	0.155	0.000	0.000	0.000	0.000	0.288	0.000	0.000	0.015	0.000	0.002	0.000	0.022	0.000	0.000	0.000	0.000	0.000	0.000	0.026	0.000	0.000	0.000	0.000	0.000
	N	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30113	30113	30113	30119	30040	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119
Other	Pearson Correlation	-.050**	-.100**	-.424**	1	-.090**	0.005	-.378**	.629**	-.060**	.138**	-.082**	-.034**	.129**	0.008	-.039**	0.005	-.057**	-0.005	-.032**	-.079**	-.057**	-.101**	0.005	-.124**	-.024**	-.136**	-.135**	.017**	-.080**	-.155**
	Sig. (2-tailed)	0.000	0.000	0.000		0.000	0.417	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.177	0.000	0.404	0.000	0.415	0.000	0.000	0.000	0.000	0.374	0.000	0.000	0.000	0.000	0.003	0.000	0.000
	N	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30113	30113	30113	30119	30040	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119
White	Pearson Correlation	-.057**	-.112**	-.478**	-.090**	1	-.018**	-.059**	-.057**	-.042**	.142**	-.025**	-0.009	.038**	0.002	.077**	.060**	.060**	-0.003	-.035**	-.082**	-.039**	-.064**	-0.011	-.019**	-.014*	-.042**	-.089**	.032**	-.032**	-.055**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000		0.002	0.000	0.000	0.000	0.000	0.000	0.112	0.000	0.744	0.000	0.000	0.000	0.659	0.000	0.000	0.000	0.000	0.053	0.001	0.017	0.000	0.000	0.000	0.000	0.000
	N	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30113	30113	30113	30119	30040	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119
Gender	Pearson Correlation	0.000	.025**	-0.008	0.005	-.018**	1	-.018**	-0.006	.033**	.041**	.015*	-.029**	0.008	-0.004	-.067**	-.210**	.023**	-0.009	.210**	-0.002	.084**	.023**	.177**	.029**	.066**	.048**	.052**	.055**	.042**	.064**
	Sig. (2-tailed)	0.953	0.000	0.155	0.417	0.002		0.002	0.306	0.000	0.000	0.012	0.000	0.168	0.469	0.000	0.000	0.000	0.119	0.000	0.790	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	N	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30113	30113	30113	30119	30040	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119
Residency	Pearson Correlation	.020**	0.004	.242**	-.378**	-.059**	-.018**	1	-.568**	.128**	-.223**	.297**	.073**	-.422**	-.014*	0.008	-.037**	.017**	-0.004	.055**	.086**	.087**	.099**	-.034**	.252**	-.027**	.299**	.142**	-.013*	.055**	.171**
	Sig. (2-tailed)	0.000	0.539	0.000	0.000	0.000	0.002		0.000	0.000	0.000	0.000	0.000	0.000	0.017	0.151	0.000	0.003	0.530	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.029	0.000	0.000
	N	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30113	30113	30113	30119	30040	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119
International	Pearson Correlation	-.032**	-.063**	-.267**	.629**	-.057**	-0.006	-.568**	1	-.084**	.095**	-.154**	-.023**	.206**	.012*	-.031**	.042**	-.053**	0.004	-0.010	-.054**	-.064**	-.131**	.055**	-.157**	-.038**	-.191**	-.232**	-.017**	-.159**	-.244**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.306	0.000		0.000	0.000	0.000	0.000	0.000	0.034	0.000	0.000	0.000	0.454	0.071	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000
	N	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30113	30113	30113	30119	30040	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119
First Generation	Pearson Correlation	-0.010	.034**	.040**	-.060**	-.042**	.033**	.128**	-.084**	1	-0.006	.126**	-.115**	-.050**	0.000	-.053**	-.043**	-.042**	-.015*	0.010	.053**	.040**	.152**	-.059**	.050**	.073**	.110**	.241**	.023**	.128**	.149**
	Sig. (2-tailed)	0.084	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.285	0.000	0.000	0.000	0.997	0.000	0.000	0.000	0.011	0.076	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	N	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30113	30113	30113	30119	30040	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119
Housing	Pearson Correlation	0.010	.294**	-.371**	.138**	.142**	.041**	-.223**	.095**	-0.006	1	-.041**	-.087**	.126**	0.007	-.038**	-.030**	-.042**	0.007	-.062**	-.121**	-.064**	-.050**	-.037**	-.139**	.095**	-.089**	.060**	.122**	.168**	0.011
	Sig. (2-tailed)	0.099	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.285		0.000	0.000	0.000	0.213	0.000	0.000	0.000	0.232	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.058
	N	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30113	30113	30113	30119	30040	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119

		Asian	Black	Hispanic	Other Race	White	Gender	Residency	International	First Gen	Housing	Public HS	Private HS	Other HS	Retention	SAT Total	SAT Math	SAT ERW	Unweighted HS GPA	Weighted HS GPA	Dual Enrollment	Test Credits	Pell	FIU CUM GPA	Bright Futures	Institutional Aid	State Aid	Federal Aid	Other Aid	Loans	Financial Aid
Public HS	Pearson Correlation	.043**	.077**	-0.006	-.082**	-.025**	.015*	.297**	-.154**	.126**	-.041**	1	-.578**	-.693**	-0.010	-.031**	-0.008	-.027**	0.001	.094**	-.262**	.178**	.116**	-.081**	.129**	.054**	.165**	.215**	.037**	.123**	.188**
	Sig. (2-tailed)	0.000	0.000	0.288	0.000	0.000	0.012	0.000	0.000	0.000	0.000		0.000	0.000	0.073	0.000	0.175	0.000	0.899	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	N	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30113	30113	30113	30119	30040	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119
Private HS	Pearson Correlation	-.041**	-.091**	.102**	-.034**	-0.009	-.029**	.073**	-.023**	-.115**	-.087**	-.578**	1	-.187**	-0.001	-0.008	-.047**	-0.010	-0.001	-.170**	-.124**	-.170**	-.145**	.038**	-0.001	-.119**	-.043**	-.244**	-.064**	-.144**	-.181**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.112	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.912	0.150	0.000	0.083	0.863	0.000	0.000	0.000	0.000	0.000	0.920	0.000	0.000	0.000	0.000	0.000	0.000
	N	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30113	30113	30113	30119	30040	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119
Other HS	Pearson Correlation	-.016**	-.012*	-.083**	.129**	.038**	0.008	-.422**	.206**	-.050**	.126**	-.693**	-.187**	1	.013*	.045**	.051**	.041**	0.000	.038**	.425**	-.064**	-.012*	.064**	-.154**	.040**	-.160**	-.043**	.011*	-.021**	-.066**
	Sig. (2-tailed)	0.005	0.039	0.000	0.000	0.000	0.168	0.000	0.000	0.000	0.000	0.000	0.000		0.024	0.000	0.000	0.000	0.999	0.000	0.000	0.000	0.037	0.000	0.000	0.000	0.000	0.000	0.048	0.000	0.000
	N	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30113	30113	30113	30119	30040	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119
Retention	Pearson Correlation	.017**	0.003	-.014*	0.008	0.002	-0.004	-.014*	.012*	0.000	0.007	-0.010	-0.001	.013*	1	0.000	-0.003	0.000	0.004	0.007	0.001	-0.010	0.002	.013*	-.023**	-0.001	-.020**	-0.003	0.003	-0.009	-.013*
	Sig. (2-tailed)	0.003	0.602	0.015	0.177	0.744	0.469	0.017	0.034	0.997	0.213	0.073	0.912	0.024		0.956	0.544	0.947	0.470	0.251	0.894	0.096	0.743	0.020	0.000	0.921	0.001	0.594	0.569	0.126	0.023
	N	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30113	30113	30113	30119	30040	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119
SAT Total	Pearson Correlation	.039**	-.149**	.061**	-.039**	.077**	-.067**	0.008	-.031**	-.053**	-.038**	-.031**	-0.008	.045**	0.000	1	.704**	.865**	-0.004	.344**	.035**	.289**	.176**	.141**	.354**	.263**	.277**	-.122**	.016**	-.072**	.130**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.151	0.000	0.000	0.000	0.000	0.150	0.000	0.956		0.000	0.000	0.473	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.000	0.000
	N	30113	30113	30113	30113	30113	30113	30113	30113	30113	30113	30113	30113	30113	30113	30113	30113	30113	30113	30034	30113	30113	30113	30113	30113	30113	30113	30113	30113	30113	30113
SAT Math	Pearson Correlation	.066**	-.123**	.018**	0.005	.060**	-.210**	-.037**	.042**	-.043**	-.030**	-0.008	-.047**	.051**	-0.003	.704**	1	.438**	-0.011	.283**	0.011	.187**	.115**	.099**	.278**	.189**	.207**	-.102**	0.004	-.075**	.088**
	Sig. (2-tailed)	0.000	0.000	0.002	0.404	0.000	0.000	0.000	0.000	0.000	0.000	0.175	0.000	0.000	0.544	0.000		0.000	0.063	0.000	0.058	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.527	0.000	0.000
	N	30113	30113	30113	30113	30113	30113	30113	30113	30113	30113	30113	30113	30113	30113	30113	30113	30113	30113	30034	30113	30113	30113	30113	30113	30113	30113	30113	30113	30113	30113
SAT ERW	Pearson Correlation	0.006	-.124**	.077**	-.057**	.060**	.023**	.017**	-.053**	-.042**	-.042**	-.027**	-0.010	.041**	0.000	.865**	.438**	1	-0.001	.275**	.042**	.266**	.173**	.115**	.288**	.220**	.228**	-.089**	0.009	-.046**	.114**
	Sig. (2-tailed)	0.333	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.083	0.000	0.947	0.000	0.000		0.845	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.138	0.000	0.000
	N	30113	30113	30113	30113	30113	30113	30113	30113	30113	30113	30113	30113	30113	30113	30113	30113	30113	30113	30034	30113	30113	30113	30113	30113	30113	30113	30113	30113	30113	30113
Unweighted HS GPA	Pearson Correlation	-.012*	-0.007	.013*	-0.005	-0.003	-0.009	-0.004	0.004	-.015*	0.007	0.001	-0.001	0.000	0.004	-0.004	-0.011	-0.001	1	0.011	0.000	-0.004	0.008	0.011	-.037**	0.004	-.031**	0.000	0.008	-0.009	-.015**
	Sig. (2-tailed)	0.042	0.248	0.022	0.415	0.659	0.119	0.530	0.454	0.011	0.232	0.899	0.863	0.999	0.470	0.473	0.063	0.845		0.053	0.963	0.534	0.187	0.055	0.000	0.472	0.000	0.953	0.167	0.136	0.009
	N	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30113	30113	30113	30119	30040	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119
Weighted HS GPA	Pearson Correlation	.057**	-.115**	.097**	-.032**	-.035**	.210**	.055**	-0.010	0.010	-.062**	.094**	-.170**	.038**	0.007	.344**	.283**	.275**	0.011	1	.168**	.339**	.141**	.449**	.307**	.296**	.289**	.014*	.111**	-.058**	.220**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.071	0.076	0.000	0.000	0.000	0.000	0.251	0.000	0.000	0.000	0.053		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.014	0.000	0.000	0.000
	N	30040	30040	30040	30040	30040	30040	30040	30040	30040	30040	30040	30040	30040	30040	30034	30034	30034	30040	30040	30040	30040	30040	30040	30040	30040	30040	30040	30040	30040	30040
Dual Enrollment	Pearson Correlation	-.023**	-.050**	.139**	-.079**	-.082**	-0.002	.086**	-.054**	.053**	-.121**	-.262**	-.124**	.425**	0.001	.035**	0.011	.042**	0.000	.168**	1	.059**	.080**	.080**	.019**	.050**	.045**	.054**	0.004	-.030**	.063**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.790	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.894	0.000	0.058	0.000	0.963	0.000		0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.471	0.000	0.000
	N	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30113	30113	30113	30119	30040	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119
Test Credits	Pearson Correlation	.030**	-.083**	.102**	-.057**	-.039**	.084**	.087**	-.064**	.040**	-.064**	.178**	-.170**	-.064**	-0.010	.289**	.187**	.266**	-0.004	.339**	.059**	1	.124**	.174**	.224**	.158**	.210**	.050**	.041**	.017**	.157**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.096	0.000	0.000	0.000	0.534	0.000	0.000		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000
	N	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30113	30113	30113	30119	30040	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119

		Asian	Black	Hispanic	Other Race	White	Gender	Residency	International	First Gen	Housing	Public HS	Private HS	Other HS	Retention	SAT Total	SAT Math	SAT ERW	Unweighted HS GPA	Weighted HS GPA	Dual Enrollment	Test Credits	Pell	FIU CUM GPA	Bright Futures	Institutional Aid	State Aid	Federal Aid	Other Aid	Loans	Financial Aid
Pell	Pearson Correlation	0.007	0.006	.091**	-.101**	-.064**	.023**	.099**	-.131**	.152**	-.050**	.116**	-.145**	-.012*	0.002	.176**	.115**	.173**	0.008	.141**	.080**	.124**	1	.017**	.108**	.134**	.207**	.563**	.027**	.172**	.283**
	Sig. (2-tailed)	0.243	0.318	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.037	0.743	0.000	0.000	0.000	0.187	0.000	0.000	0.000		0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	N	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30113	30113	30113	30119	30040	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119
FIU CUM GPA	Pearson Correlation	.032**	-.137**	.085**	0.005	-0.011	.177**	-.034**	.055**	-.059**	-.037**	-.081**	.038**	.064**	.013*	.141**	.099**	.115**	0.011	.449**	.080**	.174**	.017**	1	.155**	.138**	.126**	-.081**	.054**	-.091**	.064**
	Sig. (2-tailed)	0.000	0.000	0.000	0.374	0.053	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.020	0.000	0.000	0.000	0.055	0.000	0.000	0.000	0.003		0.000	0.000	0.000	0.000	0.000	0.000	0.000
	N	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30113	30113	30113	30119	30040	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119
Bright Futures	Pearson Correlation	.034**	-.074**	.120**	-.124**	-.019**	.029**	.252**	-.157**	.050**	-.139**	.129**	-0.001	-.154**	-.023**	.354**	.278**	.288**	-.037**	.307**	.019**	.224**	.108**	.155**	1	.141**	.833**	.018**	.028**	0.002	.372**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.920	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000		0.000	0.000	0.002	0.000	0.765	0.000
	N	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30113	30113	30113	30119	30040	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119
Institutional Aid	Pearson Correlation	0.009	.047**	-.013*	-.024**	-.014*	.066**	-.027**	-.038**	.073**	.095**	.054**	-.119**	.040**	-0.001	.263**	.189**	.220**	0.004	.296**	.050**	.158**	.134**	.138**	.141**	1	.150**	.161**	.073**	.050**	.367**
	Sig. (2-tailed)	0.125	0.000	0.026	0.000	0.017	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.921	0.000	0.000	0.000	0.472	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.000	0.000	0.000	0.000
	N	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30113	30113	30113	30119	30040	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119
State Aid	Pearson Correlation	.026**	-.017**	.105**	-.136**	-.042**	.048**	.299**	-.191**	.110**	-.089**	.165**	-.043**	-.160**	-.020**	.277**	.207**	.228**	-.031**	.289**	.045**	.210**	.207**	.126**	.833**	.150**	1	.156**	.050**	.062**	.446**
	Sig. (2-tailed)	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.000	0.000	0.000
	N	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30113	30113	30113	30119	30040	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119
Federal Aid	Pearson Correlation	-.019**	.161**	.031**	-.135**	-.089**	.052**	.142**	-.232**	.241**	.060**	.215**	-.244**	-.043**	-0.003	-.122**	-.102**	-.089**	0.000	.014*	.054**	.050**	.563**	-.081**	.018**	.161**	.156**	1	.058**	.479**	.503**
	Sig. (2-tailed)	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.594	0.000	0.000	0.000	0.953	0.014	0.000	0.000	0.000	0.000	0.002	0.000	0.000		0.000	0.000	0.000
	N	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30113	30113	30113	30119	30040	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119
Other Aid	Pearson Correlation	0.002	.103**	-.100**	.017**	.032**	.055**	-.013*	-.017**	.023**	.122**	.037**	-.064**	.011*	0.003	.016**	0.004	0.009	0.008	.111**	0.004	.041**	.027**	.054**	.028**	.073**	.050**	.058**	1	.044**	.096**
	Sig. (2-tailed)	0.765	0.000	0.000	0.003	0.000	0.000	0.029	0.003	0.000	0.000	0.000	0.000	0.048	0.569	0.005	0.527	0.138	0.167	0.000	0.471	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.000
	N	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30113	30113	30113	30119	30040	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119
Loans	Pearson Correlation	-.043**	.202**	-.056**	-.080**	-.032**	.042**	.055**	-.159**	.128**	.168**	.123**	-.144**	-.021**	-0.009	-.072**	-.075**	-.046**	-0.009	-.058**	-.030**	.017**	.172**	-.091**	0.002	.050**	.062**	.479**	.044**	1	.348**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.126	0.000	0.000	0.000	0.136	0.000	0.000	0.004	0.000	0.000	0.765	0.000	0.000	0.000	0.000		0.000
	N	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30113	30113	30113	30119	30040	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119
Financial Aid	Pearson Correlation	-0.001	.083**	.066**	-.155**	-.055**	.064**	.171**	-.244**	.149**	0.011	.188**	-.181**	-.066**	-.013*	.130**	.088**	.114**	-.015**	.220**	.063**	.157**	.283**	.064**	.372**	.367**	.446**	.503**	.096**	.348**	1
	Sig. (2-tailed)	0.920	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.058	0.000	0.000	0.000	0.023	0.000	0.000	0.000	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
	N	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30113	30113	30113	30119	30040	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119	30119

Appendix B: Table comparing change in significance of variables (four-year graduation)

	2010 Cohort 4-Year				2011 Cohort 4-Year				2012 Cohort 4-Year				2013 Cohort 4-Year				2014 Cohort 4-Year				2015 Cohort 4-Year				2016 Cohort 4-Year			
	B	Wald	Sig.	Exp(B)	B	Wald	Sig.	Exp(B)	B	Wald	Sig.	Exp(B)	B	Wald	Sig.	Exp(B)	B	Wald	Sig.	Exp(B)	B	Wald	Sig.	Exp(B)	B	Wald	Sig.	Exp(B)
Asian	-0.180	0.668	0.414	0.836	0.254	1.117	0.291	1.289	-0.094	0.180	0.671	0.910	-0.174	0.642	0.423	0.840	-0.133	0.315	0.575	0.876	-0.023	0.008	0.928	0.977	0.169	0.643	0.423	1.184
Black	0.017	0.010	0.920	1.017	-0.127	0.577	0.447	0.881	-0.386	6.946	0.008	0.680	-0.186	1.541	0.214	0.830	-0.236	2.340	0.126	0.789	0.144	0.965	0.326	1.155	-0.261	3.437	0.064	0.770
Other	0.007	0.001	0.979	1.007	0.312	3.696	0.055	1.366	-0.308	1.810	0.178	0.735	-0.189	0.660	0.416	0.828	-0.398	4.272	0.039	0.672	0.263	1.206	0.272	1.301	-0.073	0.149	0.699	0.930
White	0.162	1.225	0.268	1.176	0.183	1.296	0.255	1.201	-0.011	0.006	0.941	0.989	0.248	2.834	0.092	1.282	0.370	5.446	0.020	1.448	0.397	6.702	0.010	1.487	0.300	4.183	0.041	1.350
Gender	-0.482	23.992	0.000	0.618	-0.531	35.465	0.000	0.588	-0.608	44.165	0.000	0.544	-0.419	23.176	0.000	0.658	-0.527	36.759	0.000	0.591	-0.470	29.937	0.000	0.625	-0.402	25.433	0.000	0.669
Residency	-0.281	0.717	0.397	0.755	-0.802	8.448	0.004	0.449	0.078	0.088	0.766	1.081	-0.251	1.249	0.264	0.778	-0.345	2.584	0.108	0.708	-0.236	1.261	0.261	0.790	0.292	1.905	0.167	1.339
International	-0.127	0.068	0.795	0.880	-0.892	5.630	0.018	0.410	-0.238	0.287	0.592	0.788	-0.187	0.289	0.591	0.830	-0.205	0.406	0.524	0.815	-0.047	0.019	0.890	0.954	0.173	0.302	0.583	1.189
First Generation	-0.015	0.017	0.897	0.985	0.141	1.767	0.184	1.151	-0.060	0.304	0.581	0.942	0.182	2.897	0.089	1.199	-0.158	2.016	0.156	0.854	0.069	0.405	0.525	1.071	0.213	4.184	0.041	1.237
Housing	-0.826	29.008	0.000	0.438	-0.717	31.016	0.000	0.488	-0.532	21.272	0.000	0.588	-0.363	11.988	0.001	0.695	-0.434	15.157	0.000	0.648	-0.275	6.216	0.013	0.760	0.064	0.400	0.527	1.066
Private High School	-0.264	3.667	0.055	0.768	-0.236	3.565	0.059	0.790	0.075	0.335	0.563	1.078	-0.095	0.527	0.468	0.910	0.015	0.013	0.909	1.015	-0.191	2.014	0.156	0.826	0.162	1.695	0.193	1.175
Other High School	-0.545	8.388	0.004	0.580	-0.201	1.601	0.206	0.818	-0.256	2.944	0.086	0.774	-0.282	4.769	0.029	0.754	-0.072	0.335	0.563	0.930	-0.169	1.851	0.174	0.844	-0.079	0.456	0.499	0.924
Retention Outcome	0.061	0.277	0.599	1.063	0.121	1.324	0.250	1.129	0.089	0.690	0.406	1.093	0.044	0.176	0.675	1.045	0.056	0.272	0.602	1.058	-0.036	0.102	0.750	0.964	-0.066	0.354	0.552	0.936
SAT Total	0.000	0.014	0.907	1.000	0.000	0.000	0.983	1.000	0.001	0.383	0.536	1.001	-0.001	0.183	0.669	0.999	-0.001	0.919	0.338	0.999	0.004	9.059	0.003	1.004	0.001	0.527	0.468	1.001
SAT Math	-0.003	5.394	0.020	0.997	0.000	0.051	0.821	1.000	-0.001	0.232	0.630	0.999	0.001	0.404	0.525	1.001	-0.002	2.024	0.155	0.998	-0.001	1.605	0.205	0.999	-0.001	0.501	0.479	0.999
SAT ERW	-0.001	0.442	0.506	0.999	0.000	0.091	0.763	1.000	-0.002	1.802	0.179	0.998	0.000	0.000	0.992	1.000	0.000	0.001	0.969	1.000	-0.005	9.221	0.002	0.995	-0.003	4.437	0.035	0.997
Weighted HS GPA	0.263	3.858	0.050	1.301	0.000	0.000	0.999	1.000	0.091	0.514	0.473	1.095	0.098	0.672	0.412	1.103	0.252	4.077	0.043	1.287	-0.094	0.553	0.457	0.910	0.075	0.439	0.508	1.078
Dual Enrollment	0.056	0.067	0.796	1.057	0.011	0.005	0.945	1.011	-0.321	4.493	0.034	0.726	-0.173	1.807	0.179	0.841	-0.524	17.220	0.000	0.592	-0.493	15.263	0.000	0.611	-0.310	8.625	0.003	0.733
Accelerated Test	-0.335	12.190	0.000	0.716	-0.242	7.134	0.008	0.785	-0.292	9.878	0.002	0.747	-0.322	12.975	0.000	0.725	-0.248	7.783	0.005	0.780	-0.307	12.208	0.000	0.736	-0.453	31.415	0.000	0.636
Pell Grant	-0.158	1.052	0.305	0.854	-0.047	0.132	0.717	0.954	0.030	0.053	0.819	1.030	-0.005	0.002	0.968	0.995	-0.242	2.870	0.090	0.785	0.431	12.213	0.000	1.539	0.019	0.026	0.871	1.019
FIU CUM GPA	2.230	379.280	0.000	9.298	2.280	451.313	0.000	9.776	2.454	476.630	0.000	11.630	2.554	562.405	0.000	12.861	2.324	520.742	0.000	10.212	2.317	575.911	0.000	10.141	2.349	626.187	0.000	10.473
Bright Futures	-0.209	0.506	0.477	0.811	-0.084	0.116	0.733	0.919	-0.516	2.738	0.098	0.597	-0.498	6.355	0.012	0.608	-0.652	17.140	0.000	0.521	-0.071	0.218	0.640	0.931	-0.442	7.091	0.008	0.643
Institutional Aid	-0.315	7.387	0.007	0.729	-0.216	4.465	0.035	0.805	-0.384	13.517	0.000	0.681	-0.423	17.454	0.000	0.655	-0.567	31.566	0.000	0.567	-0.352	13.364	0.000	0.703	-0.370	8.558	0.003	0.691
State Aid	-0.098	0.086	0.769	0.907	0.009	0.001	0.973	1.009	0.258	0.628	0.428	1.294	0.249	1.452	0.228	1.282	0.178	1.875	0.171	1.195	-0.352	7.883	0.005	0.703	-0.037	0.074	0.786	0.963
Federal Aid	0.149	0.761	0.383	1.161	0.162	1.129	0.288	1.176	0.222	2.049	0.152	1.248	-0.081	0.320	0.572	0.922	-0.017	0.012	0.913	0.983	-0.054	0.125	0.724	0.947	-0.135	0.918	0.338	0.874
Other Aid	0.089	0.227	0.634	1.093	-0.048	0.067	0.796	0.953	0.190	1.161	0.281	1.209	-0.243	2.509	0.113	0.784	-0.129	0.751	0.386	0.879	-0.098	0.356	0.551	0.906	-0.462	8.230	0.004	0.630
Loans	0.154	2.259	0.133	1.166	0.062	0.443	0.506	1.064	-0.052	0.265	0.607	0.950	-0.188	3.830	0.050	0.829	-0.020	0.039	0.844	0.980	0.124	1.558	0.212	1.132	-0.013	0.019	0.890	0.987
Financial Aid	0.238	0.754	0.385	1.269	-0.460	2.866	0.090	0.631	-0.158	0.364	0.546	0.853	-0.274	1.732	0.188	0.760	-0.057	0.121	0.727	0.944	-0.130	0.610	0.435	0.878	0.074	0.172	0.678	1.076
EFC Range		9.080	0.169			3.827	0.700			8.104	0.231			4.173	0.653			20.859	0.002			13.320	0.038			9.717	0.137	
EFC Range	-0.161	0.441	0.506	0.851	0.072	0.052	0.820	1.074	-0.100	0.104	0.747	0.905	-0.080	0.146	0.702	0.923	-0.192	0.744	0.388	0.825	0.229	1.177	0.278	1.258	-0.013	0.004	0.947	0.987
EFC Range	0.062	0.049	0.825	1.064	0.011	0.001	0.974	1.011	-0.251	0.599	0.439	0.778	-0.026	0.012	0.913	0.975	-0.493	3.754	0.053	0.611	-0.083	0.121	0.728	0.920	0.033	0.022	0.883	1.033
EFC Range	-0.274	1.030	0.310	0.761	-0.175	0.277	0.599	0.840	0.089	0.074	0.785	1.093	-0.126	0.287	0.592	0.882	-0.285	1.353	0.245	0.752	0.260	1.200	0.273	1.297	-0.028	0.016	0.899	0.972
EFC Range	0.093	0.117	0.732	1.097	0.161	0.235	0.628	1.175	0.127	0.156	0.693	1.136	-0.100	0.178	0.673	0.905	-0.131	0.282	0.596	0.877	-0.178	0.514	0.473	0.837	-0.050	0.051	0.821	0.951
EFC Range	0.203	0.723	0.395	1.225	0.055	0.029	0.864	1.057	-0.409	1.700	0.192	0.664	0.096	0.165	0.685	1.101	-0.473	3.940	0.047	0.623	-0.140	0.342	0.559	0.870	0.429	3.671	0.055	1.536
EFC Range	0.225	2.140	0.143	1.252	0.106	0.147	0.701	1.112	-0.107	0.157	0.692	0.899	0.180	1.096	0.295	1.197	0.229	2.360	0.124	1.257	0.207	1.751	0.186	1.230	0.280	3.988	0.046	1.323

Appendix C: Table comparing change in significance of variables (six-year graduation)

	2010 Cohort 6-Year				2011 Cohort 6-Year				2012 Cohort 6-Year				2013 Cohort 6-Year				2014 Cohort 6-Year			
	B	Wald	Sig.	Exp(B)	B	Wald	Sig.	Exp(B	B	Wald	Sig.	Exp(B)	B	Wald	Sig.	Exp(B)	B	Wald	Sig.	Exp(B)
Asian	0.014	0.004	0.950	1.014	-0.194	0.728	0.394	0.824	-0.138	0.350	0.554	0.871	-0.002	0.000	0.991	0.998	-0.304	1.320	0.251	0.738
Black	0.355	5.707	0.017	1.426	0.443	8.882	0.003	1.557	-0.301	5.143	0.023	0.740	-0.254	3.318	0.069	0.775	0.027	0.031	0.860	1.028
Other	0.158	0.409	0.523	1.171	0.539	13.731	0.000	1.714	0.206	0.912	0.340	1.228	0.075	0.114	0.736	1.078	0.293	2.206	0.137	1.341
White	0.500	13.613	0.000	1.649	0.693	22.711	0.000	2.001	0.434	10.146	0.001	1.544	0.431	9.125	0.003	1.539	0.553	12.427	0.000	1.738
Gender	-0.080	0.780	0.377	0.923	-0.174	4.345	0.037	0.840	-0.189	5.048	0.025	0.828	-0.075	0.759	0.384	0.928	-0.188	4.176	0.041	0.829
Residency Status	-0.711	5.790	0.016	0.491	-0.656	7.328	0.007	0.519	-0.188	0.566	0.452	0.829	-0.782	12.904	0.000	0.458	-0.789	12.363	0.000	0.454
InternationalStatus	-0.258	0.316	0.574	0.773	-0.597	2.984	0.084	0.550	-0.233	0.288	0.592	0.792	-0.747	4.647	0.031	0.474	-0.908	6.624	0.010	0.403
First Generation Status	-0.055	0.257	0.612	0.947	0.060	0.363	0.547	1.062	-0.035	0.110	0.740	0.966	0.207	3.863	0.049	1.229	0.065	0.311	0.577	1.067
Housing Status	-1.426	65.827	0.000	0.240	-0.738	33.525	0.000	0.478	-0.121	1.273	0.259	0.886	-0.084	0.665	0.415	0.919	0.113	0.952	0.329	1.119
Private HS	-0.183	1.937	0.164	0.833	-0.159	1.684	0.194	0.853	-0.030	0.059	0.807	0.971	0.129	0.998	0.318	1.138	0.149	1.191	0.275	1.161
Other HS	-0.417	5.198	0.023	0.659	-0.074	0.239	0.625	0.929	-0.096	0.405	0.525	0.908	-0.062	0.219	0.639	0.940	-0.240	2.980	0.084	0.787
Retention Outcome	-0.073	0.447	0.504	0.929	0.114	1.233	0.267	1.120	0.024	0.054	0.816	1.024	0.147	1.837	0.175	1.159	0.185	2.571	0.109	1.203
SAT Math	-0.001	1.513	0.219	0.999	0.000	0.113	0.737	1.000	-0.001	1.841	0.175	0.999	0.000	0.003	0.956	1.000	0.000	0.076	0.782	1.000
SAT ERW	-0.001	0.361	0.548	0.999	0.000	0.067	0.796	1.000	-0.002	1.568	0.210	0.998	-0.003	2.530	0.112	0.997	-0.003	3.087	0.079	0.997
Weighted HS GPA	0.067	0.268	0.605	1.070	-0.216	2.766	0.096	0.805	-0.144	1.398	0.237	0.865	-0.182	2.318	0.128	0.834	-0.155	1.382	0.240	0.856
Dual Enrollment	0.037	0.030	0.863	1.037	-0.124	0.636	0.425	0.884	-0.315	4.185	0.041	0.730	-0.041	0.092	0.761	0.960	-0.065	0.215	0.643	0.937
Accelerated Test Credits	-0.329	13.398	0.000	0.719	-0.136	2.484	0.115	0.873	-0.315	13.113	0.000	0.730	-0.360	16.620	0.000	0.698	-0.311	11.056	0.001	0.732
Pell Grant	-0.036	0.062	0.803	0.965	0.087	0.516	0.473	1.091	-0.101	0.672	0.413	0.904	-0.118	0.850	0.357	0.889	-0.181	1.687	0.194	0.834
FIU CUM GPA	2.275	688.874	0.000	9.729	2.269	793.840	0.000	9.669	2.306	788.957	0.000	10.039	2.514	865.962	0.000	12.357	2.420	769.055	0.000	11.242
Bright Futures	-0.342	2.244	0.134	0.710	-0.481	5.646	0.017	0.618	-0.395	2.502	0.114	0.674	-0.201	1.337	0.248	0.818	-0.507	8.733	0.003	0.602
Institutional Aid	-0.196	3.237	0.072	0.822	-0.162	2.753	0.097	0.850	-0.156	2.557	0.110	0.856	-0.232	5.190	0.023	0.793	-0.316	8.267	0.004	0.729
State Aid	-0.131	0.264	0.607	0.877	0.149	0.460	0.498	1.160	0.179	0.487	0.485	1.196	0.015	0.008	0.931	1.015	0.196	2.204	0.138	1.216
Federal Aid	0.447	7.674	0.006	1.564	0.078	0.286	0.593	1.081	0.272	3.506	0.061	1.312	0.148	1.040	0.308	1.160	0.122	0.490	0.484	1.129
Other Aid	-0.100	0.276	0.599	0.905	0.209	1.261	0.262	1.232	0.298	2.864	0.091	1.347	-0.259	2.269	0.132	0.771	-0.237	1.778	0.182	0.789
Loans	-0.391	15.517	0.000	0.676	-0.278	9.105	0.003	0.757	-0.143	2.191	0.139	0.867	-0.437	19.349	0.000	0.646	-0.220	3.918	0.048	0.803
Financial Aid	0.316	1.867	0.172	1.371	-0.062	0.076	0.782	0.940	0.009	0.002	0.968	1.009	0.034	0.032	0.858	1.034	0.034	0.036	0.850	1.034
EFC Range		5.381	0.496			8.422	0.209			4.456	0.615			3.723	0.714			9.673	0.139	
EFC Range(1)	0.049	0.048	0.826	1.050	0.004	0.000	0.989	1.004	0.159	0.357	0.550	1.172	0.015	0.005	0.942	1.015	0.281	1.531	0.216	1.325
EFC Range(2)	0.376	2.046	0.153	1.457	0.305	1.028	0.311	1.356	-0.032	0.013	0.909	0.969	0.002	0.000	0.994	1.002	0.159	0.377	0.539	1.172
EFC Range(3)	0.116	0.215	0.643	1.124	-0.040	0.020	0.887	0.961	0.050	0.031	0.860	1.051	0.068	0.085	0.771	1.070	0.391	2.397	0.122	1.478
EFC Range(4)	0.071	0.078	0.779	1.074	-0.047	0.026	0.871	0.954	0.199	0.504	0.478	1.220	-0.175	0.538	0.463	0.840	0.112	0.198	0.656	1.119
EFC Range(5)	-0.028	0.014	0.905	0.972	-0.400	2.103	0.147	0.670	-0.127	0.216	0.642	0.881	-0.266	1.246	0.264	0.767	0.162	0.403	0.525	1.176
EFC Range(6)	-0.120	0.644	0.422	0.887	-0.155	0.467	0.494	0.857	-0.064	0.082	0.774	0.938	0.001	0.000	0.997	1.001	0.411	6.802	0.009	1.508

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