

RETENTION AS PREDICTED BY A STUDENT PROFILE AT A HISPANIC SERVING
INSTITUTION

A Dissertation

by

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This dissertation meets the standards for scope and quality of
Texas A&M University-Corpus Christi and is hereby approved.

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ABSTRACT

Retention is high on the list of priorities for both college and university administrators, as well as policy makers. It raises the question what high school data are known before a student attends a college that are predictive of student retention? This study examined 3445 first-time-in-college students from three academic years. Predictors included, age, gender, ethnicity, admission status, high school GPA, ranking percentile, and ACT/SAT scores. The outcome variable was college retention. Data analyses involved chi-square of independence and logistic regression. Results indicated ranking percentile, ACT/SAT scores, and admission status were statistically significant for retention. However, the relationships were weak and the model did not increase predictive values for retention. Although some demographic information and pre-college variables can predict retention, the type of predictors needs to expand to provide a stronger predictive model. Admissions processes may need to consider non-traditional information to include for both admissions and retention prediction.

DEDICATION

I dedicate this dissertation to my late mother, Teresa Gutierrez, whom I miss more and more each day. I hope you are smiling down with pride. I also dedicate this dissertation to my husband, Michael Silvas, without whom, I would never have been able to reach this point in my educational journey. I know at times it was trying and I will forever be thankful for all his love, encouragement, and support. Finally, I dedicate this dissertation to my children, Mathias Anthony and Reagan Alyse, whom I hope will always know that everything I do is for them. They are the light of my life and I am proud to be their mother.

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TABLE OF CONTENTS

CONTENTS	PAGE
ABSTRACT.....	v
DEDICATION.....	vi
ACKNOWLEDGEMENTS.....	vii
TABLE OF CONTENTS.....	ix
LIST OF FIGURES	xiii
LIST OF TABLES.....	xiv
CHAPTER I: INTRODUCTION.....	1
Background and Setting.....	1
Statement of the Problem.....	4
Theoretical Framework.....	7
Purpose of the Study.....	9
Research Questions.....	10
Definition of Terms	11
Limitations	15
Delimitations.....	16
Significance of the Study.....	16
CHAPTER II: REVIEW OF THE LITERATURE	18
Introduction.....	18

Theoretical Framework.....	18
Bean’s Model of Student Attrition.....	18
Tinto’s Theory of Student Departure	19
Astin’s I-E-O Model	20
Student Characteristics	21
Millennial Student.....	22
Past Academic Performance	24
Nonacademic Factors	24
Enrollment Status	25
Ethnicity	27
Gender.....	28
Parental Background.....	29
Socioeconomic status.....	30
Age.....	32
High School Preparation.....	34
Recent Texas Higher Education Plans.....	34
Closing the Gaps	35
60x30TX	37
Conclusion	38
Chapter III: Method	39

Introduction.....	39
Research Design	39
Assumptions.....	39
Subject Selection.....	40
Instrumentation	41
Data Collection	44
Data Analysis	44
Conclusion	46
CHAPTER IV: RESULTS.....	47
Statistical Assumptions.....	47
Statistical Analysis.....	47
General Results	51
Research Questions.....	53
Summary.....	57
CHAPTER V: SUMMARY OF RESULTS AND CONCLUSIONS, DISCUSSION, IMPLICATIONS, AND RECOMMENDATIONS FOR FUTURE RESEARCH.....	59
Conclusions.....	60
Discussion.....	67
Implications	71
Recommendations for Future Research.....	76

Retention Model	79
References.....	82

LIST OF FIGURES

FIGURES	PAGE
Figure 1: Astin’s Input-Environment-Outcome (I-E-O) Model.....	8
Figure 2: Pre-College Factors Model.....	80

LIST OF TABLES

TABLES	PAGE
Table 1: Gender.....	48
Table 2: ACT/SAT Rank.....	48
Table 3: Retention Status.....	49
Table 4: Class Rank.....	49
Table 5: Age.....	49
Table 6: Ethnicity 4 Categories.....	50
Table 7: Ethnicity 2 Categories.....	51
Table 8: Admission Decision.....	51
Table 9: Classification Table.....	52
Table 10: Chi-squared of Age and Retention.....	53
Table 11: Chi-squared of Gender and Retention.....	54
Table 12: Chi-squared of Ethnicity and Retention.....	54
Table 13: High School Percentile Prediction of Retention.....	55
Table 14: ACT/SAT Rank Prediction of Retention.....	56
Table 15: Admission Status Prediction of Retention.....	56

CHAPTER I: INTRODUCTION

Background and Setting

In 2011, Texas House Bill 9, also known as the Higher Education Outcomes-Based Funding Act, was enacted to establish student success performance based on funding for colleges and universities. A portion of funding for universities will be appropriated to those institutions that support students throughout their college career and promote course and degree completion according to various performance-based student success measures, yet to be specifically determined. According to Ellis and Bowden (2015), performance-based funding became a favored tool of policy makers as they push higher education toward greater efficiency and better outcomes in terms of college retention and completion. With formula funding being dependent on retention and graduation rates, it is becoming more imperative that colleges and universities begin focusing on student retention. Currently in Texas, state formula funding rewards only college access. Texas needs to increase both student access to higher education and student success (THECB, 2016). The inclusion of the student success measures in the funding will further motivate institutions to be innovative in developing and strengthening student support services such as counseling, tutoring, and degree planning (THECB, 2016). In addition, the state of Texas is currently in the stages of entering into a new era in higher education. For 15 years the importance of higher education united around the goals of the previous statewide plan, Closing the Gaps. The new higher education strategic plan, 60x30TX, focuses on student success by striving for 60% of the 25-34 year old Texas population to hold a certificate or degree by 2030. By following a student-centered course and prioritizing higher education completion and workforce readiness, the new plan enables the state, institutions of higher education, and the private sector to set Texas on a path toward continued prosperity (THECB, 2016). In order to

compete and remain relevant in the future, students need to earn quality postsecondary credentials with skills that employers need. The 60x30TX Plan addresses students' desire for a better life, employers' desire to remain competitive, and the state's need for a healthy economy (THECB, 2016). The new strategic plan also strengthens the challenges Texas institutions to prepare students for the jobs of the future while also inspiring students to contribute to a greater Texas society (THECB, 2016).

Colleges and universities feel pressured to increase retention rates. They have been battling low retention rates of the first-time-in-college freshman (FTICF). As a result, universities are taking into consideration the backgrounds and precollege characteristics of entering college students (Cole, 2009). Students leave a university for a variety of reasons that can include academic difficulty, adjustment problems, uncertain goals, lack of commitment, inadequate finances, lack of student involvement, and poor fit to the institution (Morrow & Ackermann, 2012). In order to begin to research the reasons students leave, universities are looking at the FTICF precollege data. Students enter into universities with a variety of high school academic experiences, exposure to college information, and family socioeconomic and educational influences (Cole, 2009). The precollege information and characteristics help shape the FTICF expectations and attitudes of what it is like to be in college.

The characteristics of the students entering college have been changing over the past couple of years. A current challenge that colleges and universities are facing in the United States is the retention of the millennial FTICF (Turner & Thompson, 2014). Generational differences between students and institutions may explain the retention issue. The incoming FTICF have different characteristics and traits from past generations. The millennial FTICF have grown up in a world where technology is everywhere and educators need to understand the new generation of

learners in order to educate them effectively (Phillips & Trainor, 2014). Nevertheless, the incoming FTICF face some of the same developmental and transitional challenges as past generations. However, their learning styles, educational expectations, and socialization characteristics challenge the traditional services, programs, and instructional strategies of colleges and universities (Turner & Thompson, 2014). The incoming FTICF has certain characteristics and traits that describe the millennial generation: (a) entitled; (b) optimistic; (c) civic minded; (d) close parental involvement; (e) values work-life balance; (f) impatient; (g) multitasking; and (h) team oriented (DeVaney, 2015).

Moreover, millennials have an unrealistic confidence about their academic skills that makes them unaware of their true academic capabilities (Turner & Thompson, 2014). As a result, the FTICF develop unrealistic expectations of personal academic performance and a university's responsibilities in cultivating the college experience (Turner & Thompson, 2014). This unique generation of FTICF requires and expects a different approach to learning (Phillips & Trainor, 2014). Many FTICF expect faculty and administrators to be openly accessible and available at all times guidance is required, as they have experienced with their parents and high schools (Turner & Thompson, 2014). A technological world and social media, such as Twitter, Facebook, Snapchat, texting, iPhones and iPads have surrounded this new generation of students. The FTICF have never known a world without computers and the Internet and see these tools as essential parts of their everyday lives (Phillips & Trainor, 2014). This dependence of technological mechanisms has decreased the ability of these students to resolve conflict, critically think, and develop face to face communication techniques (Turner & Thompson, 2014).

The educational needs of the FTICF are becoming a great challenge for contemporary colleges and universities. Colleges and universities have been facing low retention rates of the FTICF. The characteristics of the students entering into college have been changing over the past couple of years. Students have many opportunities to leave an institution or change colleges even after their first semester. Student retention depends on several factors, including their involvement on campus, their connection to the campus environment, and their ability to succeed (Stewart, Doo Hun, & JoHyun, 2015). As a result, university officials have answered the student retention issue by developing effective first year programs that will enhance the retention of the FTICF, student involvement on campus life, and changing a campus environment to encourage colleges and universities to focus on first year student success (Stewart, Doo Hun, & JoHyun, 2015). Colleges and universities are developing programs and strategies because they feel pressured to increase retention rates. Stakes are high because money is lost when students drop out. Even with programs and strategies retention rates have not increased. Unfortunately, universities cannot always control why students do not continue with their education. Currently, the Texas Higher Education Coordinating Board is shifting its focus from the state's Closing the Gap strategic plan. In 2000, Closing the Gaps changed the educational emphasis from high school graduation to college access and success (THECB, 2016). The new 60x30TX Plan focuses on college completion and workforce readiness. The 60x30TX Plan is building on Closing the Gaps, and Texas must continue to re-imagine college and college-going to meet the state's workforce needs (THECB, 2016). This thrusts retention efforts to the forefront.

Statement of the Problem

With Texas state legislation mandating performance-based funding tied to retention as one criterion, university officials are under intense pressure to find ways to retain more students.

Texas House Bill 9 stated that it is in the state's highest interest to evaluate student achievement at higher education institutions and to develop higher education funding policy based on that evaluation. Furthermore, Texas House Bill 9 required the Coordinating Board to propose formula funding that allocated a portion of state funding for colleges and universities based on student success measures (THECB, 2012). According to the Texas Higher Education Coordinating Board (THECB, 2016), each of the 38 public institutions will earn points for their performance on seven student proposed metrics with the points being used to determine each institution's proportional share of outcomes-based funding. The points will then be scaled and weighted. The proposed seven student metrics proposed by House Bill 9 are as follows: (a) total number of undergraduate degrees; (b) undergraduate degrees adjusted by graduation rate; (c) undergraduate degrees per 100 undergraduate full-time student equivalents; (d) undergraduate degrees to at-risk students; (e) completion of 30 semester credit hours at that institution; (f) completion of 60 semester credit hours at that institution; (f) and completion of 90 semester credit hours at that institution. In 2014, Texas allocated \$6.6 billion to higher education, with 10% of that amount (\$660 million) to performance based funding (Ellis & Bowden, 2015). With the assumption that all 38 public four-year institutions performed equally, each would receive \$1.56 million for each weighted criteria (Ellis & Bowden, 2015). However, not all institutions will perform equally and universities are at risk to lose millions.

Two crucial question remains intact. First, why are students leaving? Second, what can university personnel do to help them to stay? The literature suggests there are characteristics a student possesses that may determine if she or he is at-risk for leaving an institution (Cochran et al., 2014; Schreiner, 2013; Tinto, 1988). A majority of students leave before starting their second year of college (Morrow & Ackermann, 2012). Because students are away from home for the

first time, they may feel that they do not belong, feel rejected, and not able to adjust to the normal academic challenges that come with college life (O’Keefe, 2013). In addition, there are stressors, such as relocation to the university, separation from family and friends, adjustment to academic life, higher expectations from faculty and staff, and the need to make new friends that can make them drop out (O’Keefe, 2013).

The United States has seen a significant demographic change over the last few decades due to the steady growth of the Hispanic population (Samuel & Scott, 2014). The number of Hispanic Serving Institutions (HSIs) continues to increase as more and more Hispanics attend institutions of higher learning (Medina & Posadas, 2012). From 2000-2010, the number of Hispanic citizens grew to 50.5 million nationally (Samuel & Scott, 2014). In Texas, Hispanic enrollments in higher education have risen considerably. Between 2000-2013, Hispanic undergraduate enrollment grew by 118% overall (Samuel & Scott, 2014). Despite this significant growth in college access, Hispanic students have not done well in college completion. Hispanic Serving Institutions face several challenges because they serve a population that has more needs with respect to academic, financial, cultural, and social capital (The role of Hispanic-serving, 2013). The students that attend HSIs are more likely to be of lower socioeconomic status, from non-native English-speaking families, first or second-generation immigrants, first-generation college attendees, and college attendance closer to home (The role of Hispanic-serving, 2013). In addition, during college these students are more likely to receive financial aid, attend college part-time, work part-time or full-time, and commute (The role of Hispanic-serving, 2013). These students also come to college with lower levels of academic preparedness than students in non-HSIs (The role of Hispanic-serving, 2013). With the growth of the Hispanic student population, it is imperative for HSIs to develop institutional practices that support these students’ retention.

A regional public Hispanic Serving Institution (HSI) in South Texas has continually seen retention rates fall below the Texas average retention rates. The university serves approximately 8,300 students that mostly come from South Texas with 82% of the population being undergraduate students. The student body is comprised of 53% men and 47% women. The university demographics reflect the South Texas area: 62% Hispanic, 27% White, 5% African American, and 6% international students. Typically, each year there are approximately 1,200 first-time-in-college incoming freshman students. The university faces challenges that are representative of challenges faced by HSIs. Most of the university's incoming population are first generation college students. In addition, most students select the university due to its location and close proximity to their home. Due to the level of academic preparedness of students attending the university, the university uses an alternate admission process. The alternate admissions process uses an all-inclusive approach that includes a student's life experiences, classroom performance, leadership skills, and community service to determine admission to the institution. However, it is not known which pre-college variables best predict retention for the first-time-in-college freshman. The anticipated outcome of the data analyses is the development of a prediction model for retention for the FTICF at a regional public Hispanic Serving Institution.

Theoretical Framework

The study is grounded in Alexander Astin's Input-Environment-Outcome (I-E-O) model. Astin's I-E-O model, depicted in Figure 1, has been used as a guide for assessment activities in higher education (Astin, 1993). The basis of this model is composed of three elements. The first element is students' inputs such as certain student qualities and characteristics, such as demographics, when they enter into college. The second element is the type of educational

environment that student has at the institution. Finally, are the outcomes which are the student's qualities and characteristics as they graduate from college.

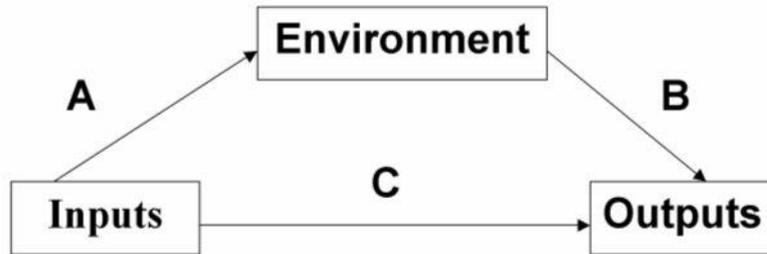


Figure 1. Astin's Input-Environment-Outcome (I-E-O) Model.

Astin (1970) defined student outputs as the aspects of the student's development that the college either does influence or attempts to influence and can refer to student's achievements, knowledge, skills, values, attitudes, aspirations, interests, and daily activities. As stated by Thurmond and Popkess-Vawer (2003), outputs in education can include outcome measures, such as grade point average, examination scores, course performance, degree completion, and overall course satisfaction. Student inputs are the talents, skills, aspirations and other potential items for growth and learning that the new student brings into college (Astin, 1970). Examples of student inputs include demographic information, educational background, degree aspiration, reason for selecting an institution, financial status, and major (Thurmond & Popkess-Vawer, 2003). The college environment refers to the aspects of the higher educational institution that is capable of affecting the student (Astin, 1970). The environment includes the actual experiences that a student goes through while they are attending a college or university. According to Astin (1993), the input-output is a reference to the state of the student at two different points in time (beginning of college and end of college) and the environment refers to the intervening experiences. The I-E-O model provides a way to identify incoming characteristics as an input and academic success as an outcome.

Purpose of the Study

The purpose of the study is to examine which pre-college variables best predict retention for the first-time-in-college freshman (FTICF). The anticipated outcome of data analyses is the development of a prediction model for retention for the FTICF.

For many institutions, retention rates are reviewed and compared over a course of a few years, however, student backgrounds and characteristics may have an impact on the retention of the incoming students. Student characteristics and background variables are important in looking at retention prediction models because past behavior is expected to predict future behavior (Bean & Metzner, 1985). Researchers have repeatedly found that a student's chances of degree completion are to a significant degree a function of their own individual backgrounds, which include high school grades, gender, ethnicity, parental income and education, standardized test scores, and age (Astin & Oseguera, 2012). Higher education officials look to a student's individual backgrounds because their backgrounds often tell us about the student's past as well as a look into their future performance. Taking into account the major variables that a student faces will give institutions a look at the probability of retention of the incoming students. For instance, when academic and environmental variables are both good, students should remain in college and when academic and environmental variables are both poor, students should leave college (Bean & Metzner, 1985). In addition, when academic variables are good but environmental variables are poor, students should leave and when environmental support is good and academic support is poor, student would be expected to remain because the environmental support makes up for low scores on the academic variable (Bean & Metzner, 1985). However, little is known about the academic and environmental variables of a FTICF's high school experience as it relates to college success.

Research Questions

The study involves a number of variables. There are two independent variables. The first independent variable is demographics: (a) age; (b) gender; and (c) ethnicity. The second independent variable is pre-college characteristics: (a) high school percentile; (b) SAT/ACT score; (c) first-generation status; (d) admission status; (e) STAAR college readiness score; (f) STAAR writing score; (g) STAAR mathematics score; (h) Texas Success Initiative reading score; (i) Texas Success Initiative writing score; and (j) Texas Success Initiative mathematics score. The dependent variable is a student's retention to the following year. The study is guided by the following research questions:

1. How are demographics related to the retention of the first-time-in-college freshman?
 - 1.1. How is age related to the retention of the first-time-in-college freshman?
 - 1.2. How is gender related to the retention of the first-time-in-college freshman?
 - 1.3. How is ethnicity related to the retention of the first-time-in-college freshman?
2. What pre-college variables are predictors of the retention of the first-time-in-college freshman?
 - 2.1. How well does high school percentile predict of the retention of the first-time-in-college freshman?
 - 2.2. How well do SAT/ACT scores predict of the retention of the first-time-in-college freshman?
 - 2.3. How well does first-generation status predict of the retention of the first-time-in-college freshman?
 - 2.4. How well does admission status predict of the retention of the first-time-in-college freshman?

- 2.5. How well does the STAAR college readiness score predict of the retention of the first-time-in-college freshman?
- 2.6. How well does the STAAR writing score predict of the retention of the first-time-in-college freshman?
- 2.7. How well does the STAAR mathematics score predict of the retention of the first-time-in-college freshman?
- 2.8. How well does the Texas Success Initiative reading score predict of the retention of the first-time-in-college freshman?
- 2.9. How well does the Texas Success Initiative writing score predict of the retention of the first-time-in-college freshman?
- 2.10. How well does the Texas Success Initiative mathematics score predict of the retention of the first-time-in-college freshman?

Definition of Terms

The study will be conducted in a regional public Hispanic Serving Institution (HSI) in South Texas. Students attending a Texas public higher education institution must be in compliance with the Texas Success Initiative (TSI) in order to enroll in a public institution of higher education (THECB, 2012). The law requires for all entering college students to be assessed for college readiness in reading, mathematics, and writing unless the student qualifies for an exemption (THECB, 2012). A student may be exempt from meeting TSI standards by meeting one of the following exemptions: (a) a composite score of 23 or higher with at least a 19 on the English test and/or mat sections of the ACT; (b) a combined verbal and math score of 1070 with a minimum of 500 on the verbal and/or math test of the SAT; (c) a STAAR EOC with minimum score of level 2 on the English III shall be exempt from the TSI assessment required

for both reading and writing; and (d) a minimum score of level 2 on the algebra II EOC shall be exempt from the TSI Assessment required for the mathematics section (THECB, 2012). For high school students, the state of Texas student assessment program is designed to measure the extent to which a student has learned and is able to apply the defined knowledge and skills by taking the State of Texas Assessments of Academic Readiness (STAAR) (TEA, 2016). The STAAR end-of-course (EOC) assessments for high school students are English I, English II, algebra I, biology and U.S. history (TEA, 2016).

The following definitions are provided to ensure a clear understanding of the terms used in the study:

State of Texas Assessment of Academic Readiness (STAAR): state testing assessment program designed to measure the extent to which students have learned and are able to apply the knowledge and skills defined in the state-mandated curriculum standards, the Texas Essential Knowledge and Skills (TEKS) (TEA, 2016).

Texas Success Initiative (TSI): program designed to help institutions of higher education determine college readiness in the general areas of reading, writing, and mathematics (THECB, 2016).

Academic Years: There are three academic years, 2012-2013, 2013-2014, and 2014-2015. The construct definition of an academic year is described by the university from August to May. The operational definition of academic year are those students designated as first-time-in-college freshmen by the university for the duration of 2014-2015 or 2015-2016 (TAMUK, 2016).

Independent Variables

There are two independent variables: demographics and precollege characteristics. Both are based on self-reporting from the student application.

Demographics: There are three demographic categories.

1. Age: The construct definition of gender is a category established by the university. The operational definition is a designation given to each student as self-reported from the student application.

2. Gender: The construct definition of gender is a category established by the university. The operational definition is a designation given to each student as self-reported from the student application as either male or female.

3. Ethnicity: The construct definition of ethnicity is a category established by the university. The operational definition is a designation given to each student as self-reported from the student application as either American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or other Pacific Islander, Hispanic, or White.

Pre-college characteristics: There are ten pre-college categories.

1. High school percentile: The construct definition of high school percentile is a category established by the university. The operational definition is a percentage of class rank out of total graduating students given to each student from official high school transcript.

2. SAT/ACT scores: The construct definition of the SAT/ACT exams is a college admissions test, measuring what was learned in high school to determine academic readiness for college. The operational definition is a score that determines college admission. A SAT total score below 830 is identified by the university as low, 831-1139 is identified by the university as moderate, and 1140 and above is identified by the university as high. An ACT composite score below 15 is identified by the university as low, 16-22 is identified by the university as moderate, and 23 and above is identified by the university as high.

3. First generation status: The construct definition of first generation status is a category established by the university. The operational definition is a designation given to each student as self-reported from the student application.

4. Admission status: The construct definition of admission status is a category established by the university. The operational definition is a designation given to students to admit them as accepted, alternate admission, or special admission.

5. STAAR college readiness score: The construct definition is the university will determine college readiness for college-level course work in the general areas of reading, writing, and mathematics (TSI, 2015). The operational definition is a passing score that determines college readiness in writing, reading, and mathematics.

6. STAAR writing score: The construct definition is the student will demonstrate the ability: (a) to understand and analyze a variety of written texts across reading genres; literary texts; and informational texts; (b) to compose a variety of written texts with a clear controlling thesis; coherent organization; sufficient development; and effective use of language and conventions; (c) to revise a variety of written texts; and (d) edit a variety of texts (STAAR, 2015). The operational definition is a score of at least 2000 on the English III-level 2 exam that determines college readiness in writing.

7. STAAR mathematics score: The construct definition is the student will demonstrate an understanding of how to: (a) use algebraic methods to manipulate numbers; expressions and equations; (b) describe and graph various functions and their inverses; (c) write and solve systems of equations and inequalities; (d) describe, write, and solve exponential logarithmic functions and equations; and (e) describe, write, and solve cubic, cube root, absolute value; and rational functions, equations, and inequalities (STAAR, 2014). The operational definition is a

score of at least 4000 on the Algebra II-Level 2 exam that determines college readiness in mathematics.

8. TSI writing score: The construct definition is the student will demonstrate college readiness in essay revision, agreement, sentence structure, and sentence logic (TSI, 2015). The operational definition is a passing score of an essay score of 5 or an essay score of 4 and multiple choice of 363 that determines college readiness in writing.

9. TSI reading score: The construct definition is the student will demonstrate college readiness in literary analysis, main idea and supporting details, inferences in a text or texts, and author's use of language (TSI, 2015). The operational definition is a passing score of 351 that determines college readiness in mathematics.

10. TSI mathematics score: The construct definition is the student will demonstrate college readiness in elementary algebra functions, intermediate algebra functions, geometry and measurement, and data analysis, statistics, and probability (TSI, 2015). The operational definition is a passing score of 350 that determines college readiness in mathematics.

Dependent Variable

Retention: The construct definition is full-time students who enroll in at least 12 hours their first fall semester and are still enrolled at the same institution the following fall semester (THECB, 2016). The operational definition is FTIC students enrolled in the Fall 2014 are enrolled in the Fall 2015 semester and the FTICF students enrolled in the Fall 2015 semester are enrolled in the Fall 2016 semester.

Limitations

The study is limited in three ways. First, the findings cannot be generalized to a larger population. The population consists of incoming freshman at one small Hispanic Serving

institution in South Texas with the average freshman class size of 1200 students. Second, the study is quantitative but not experimental in nature. Third, the main form of data collection is from self-report on admission application.

Delimitations

The study is delimited to first time in college freshman students at a South Texas university because the focus of the study was on retention of first year students. The predictor variable of the student's pre-college characteristics because past behavior can help to predict future performance. The outcome measure of retention because a portion university funding is given based on freshman retention to the following academic year. Due to the non-probability nature of sampling, external validity is limited to the study's participants. Due to the non-experimental nature of the study, no casual inferences will be drawn.

Significance of the Study

The intention of the study is to identify the pre-college student variables that will be useful in the prediction of retention and persistence of first-time in college freshman. Being able to identify the student profiles of successful versus at-risk students will enable the institution to provide academic, personal and/or social services that could assist the at-risk student and enhance the student success and retention (Laskey & Hetzel, 2011). With the new 60x30TX Plan focusing not only on college completion but also the marketable skills students gain from a higher education institution. It is imperative for colleges and universities to focus on retention because the knowledge and skills gained from higher education results in greater individual marketability, wealth, and self-reliance (THECB, 2016). As college completions increase, wages go up and state tax revenues go up, leading to a reduction in public expenditures in areas such as Medicaid and corrections (THECH, 2016). In addition, it is imperative for institutions to be able

to recognize any student characteristics that can lead to a student leaving the institution. A student profile can serve as an early warning assessment by the university. Students have plenty of personal reasons to leave an institution and it is up to the institutions to create a reason for students to stay. There are thousands of dollars at stake when a student leaves an institution. In addition, a student's future is greatly affected when s/he decides to leave the college or university.

CHAPTER II: REVIEW OF THE LITERATURE

Introduction

Student retention has been a major concern for higher education institutions. Not every student who enters into a college or university will be enrolled in that institution for the following year. Higher education institutions then begin looking into reasons why students leave before completing their baccalaureate degree. There are a variety of factors that have an influence on a student's eventual student departure and these factors include entering characteristics, goals and commitments, institutional experiences, quality of efforts, and educational outcomes. This chapter will discuss the theoretical models that are focused on student retention and the entering student demographic and characteristics that are studied when gaining insight into reasons students leave an institution.

Theoretical Framework

There have been many theoretical research models that have contributed to the research of why students leave an institution after their first year of college. Research frequently begins with looking at the most influential findings from Bean (1981), Tinto (1988), and Astin (1970). Each theoretical model provides a framework of looking at student characteristics and backgrounds that might provide valuable information for higher education officials to begin looking at in order to predict student retention.

Bean's Model of Student Attrition

Bean's (1981) model of student attrition began looking at background variables that were expected to influence indicators of a students' interaction with an institution. The variables defined as academic (parents' education, high school grades) and social (close friends, helpfulness of advisor, informal contact with faculty members, university grades, and

memberships in campus organizations) were incorporated in the model as organizational variables. The organizational variables were expected to affect intervening variables. The intervening variables affected a student's institutional commitment (Bean, 1981). The more intentions a student had to stay at an institution, the less likely the student would leave. In addition, to the variables there were student personal determinants (goal commitment, major and occupational certainty, and confidence) that had a direct effect on a student's commitment and dropout (Bean, 1981). Finally, there were environmental variables (opportunity to transfer, job opportunity, family approval of the institution, family responsibilities, marriage, and finances) that had an effect on institutional commitment and dropout (Bean, 1981). The success of the model is due to the attitudinal variables and the student intentions. Currently, no data are available on high school students as pre-college variables. Bean's model is insufficient for this study.

Tinto's Theory of Student Departure

Tinto's (1988) theory of departure states that college students are moving from one community to another when they enter into college. As the students transition they must separate themselves from past associations in order to complete the transition to be able to fully incorporate into college life (Tinto, 1988). Tinto's theory of student departure begins at the first stage of separation. Separation requires students to be able to disassociate themselves from their past community which includes their previous high school and their place of residence (Tinto, 1988). The stage of separation can prove to be difficult and stressful for students because it very often requires for leaving behind old habits and patterns of affiliation. The second stage of the college career is transition to college. The transition involves a period between the old and the new and having begun the process of separating themselves from the past but not quite accepting

the new norms and patterns of college life (Tinto, 1988). At this stage of transition, students have not quite felt a bond and connection to the college but they have begun to let go of the bonds of the past. The problems associated with both the stages of separation and transition are both stressful for the student but it is the student's reaction to the stress that determines if a student stays or leaving during these stages (Tinto, 1988). After passing through the separation and transition stage a student is then faced with becoming incorporated and integrated into college life (Tinto, 1988). At this stage the student has left behind their past norms and behaviors and is faced with adjusting and adopting the norms at the college setting and establishing membership into the college community. Not all students are able to navigate the many roads of college life and cannot become integrated into the college setting or once they have navigated they find they are not a fit into the college. According to Tinto (1988) the tasks and problems associated with each stage must be encountered and overcome in order for student to become fully incorporated into college life. Tinto's theory takes into account factors involved when students are already in college. If colleges and universities are to predict success, they need to consider pre-college factors. Although Tinto's theory is valuable for tracking students in college, it does not help establish retention predictors prior to the college experience.

Astin's I-E-O Model

Astin's I-E-O models states that student outcomes (O) are a function of the environment they experience (E) and their input characteristics (I) (Purdie & Rosser, 2011). Astin's theory notes that to understand why students remain enrolled, or earn grades that place them on academic probation, or achieve any other outcome an institution must take into account the entering characteristics of the students and what they experience during college (Purdie & Rosser, 2011). Alexander Astin developed the input-environment-output (I-E-O) model while

working as a clinical and counseling psychologist. Working in a medical setting enabled Astin to evaluate human behavior in a developmental framework (Astin, 1993). Astin then moved from clinical to educational psychology where he was still able to continue his research while observing graduate programs at a higher education institution. The I-E-O model consists of outputs, which refers to the talents students are trying to develop in an educational program; inputs, which refers to the personal qualities a student brings initially to an educational program; and the environment, which refers to a student's actual experiences during an educational program (Astin, 1993). The outputs in the model can be described as the outcome or dependent variable, the environment can be described as the independent variables, and the input can be called the control or pretest variables. Pascarella and Terenzini (2005) simplify the I-E-O model by explaining the model as college outcomes are viewed as a function of three sets of elements: (a) inputs, the demographics characteristics, family backgrounds, and academic and social experiences that students bring to college; (b) environments, the full range of people, programs, policies, cultures, and experiences that students encounter in college; and (c) outcomes, students' characteristics, knowledge, skills, attitudes, values, beliefs, and behaviors of students after college. According to Astin (1993), the assessment and evaluation in education are generally concerned with the effects of the environmental variables on outcome variables. The environment and outputs relationship cannot be understood with taking into consideration the student inputs. Inputs are related to both a student's outputs and environments, meaning that inputs can affect the observed relationship between environments and outputs (Astin, 1993).

Student Characteristics

Pre-college characteristics have been considered to be a useful predictor of student retention. High school grades, admission entrance scores, sex, and race were considered to add

significantly to the prediction of retention (Astin, 1993). With standardized testing and college readiness exams, students now have other factors that can aid in the prediction of college retention and completion. Research has confirmed that freshmen retention depends on a combination of factors including academic preparation, sociocultural background, academic, support, financial assistance, and other college services (Astin, 1975; Tinto, 1975, 1993).

Millennial Student

The millennial students are individuals that were born between 1982 and 2002 (Roehl, Reddy, & Shannon, 2013). In addition, they are also referred to as digital natives and the net generation due to the fact that they have been exposed to technology from a very young age. Millennials have had greater access to technology, information, and digital media far more than any prior generation (Roehl et al., 2013). Millennial characteristics include 24/7 information connectedness, a preference for environments that support multitasking, a gravitation toward group activity, and appreciation of the social aspects of learning (Roehl et al., 2013). The millennial generation rely heavily on technology for entertainment, to interact with others, and even for emotion regulation (Lerzan & Ruth, 2013). One of the prominent characteristics of the millennial student is their access to technology, as they are considered technology savvy having always grown up with a computer.

Other millennial characteristics include being treated as special, sheltered, confident, team-oriented, conventional, pressured, entitled, optimistic, civic minded, close parental involvement, values work-life balance, impatient, multitasking, and achieving (Much, Wagener, Breikreutz, & Hellenbrand, 2014; DeVaney, 2015). Much et al. (2014) further described the traits of the millennial students by stating they are special in that they dominate America's agenda. In addition, the millennials are described as sheltered due to an increase in the helicopter

parents who constantly contact faculty and administrators to discuss student grades, moods, and feeds to the belief their child requires extra special care (Goldman & Martin, 2016). In regards to confidence, the millennial generation is viewed as extreme optimists who believe that positive attitudes may be adequate enough to solve all problems (Much et al., 2014). The millennial student's team oriented and conventional characteristics are a great contrast to the individualist style of the students of Generation X. The millennial students are a generation that feels pressured in academics because they want to avoid making a wrong career choice at a critical time in their lives (Much et al., 2014). Furthermore, millennial students feel they are very capable and look for a more hands-on role to make a bigger impact (DeVaney, 2015). Also, the millennial generation focuses on achievement by showing great concern with grades and academic performance, this leads to them constantly wanting feedback before they have completed an assignment or exam (Cardon, 2014).

According to Much et al. (2014) the millennial generation also faces several key health, academic, and social concerns. The health concerns that has shown to greatly increase for the millennial generation include, attention-deficit/hyperactivity disorder, asthma, and obesity (Much et al., 2014). Due to the millennials being described as pressured and hyper-focused on achievement, they often experience increased stress and feelings of being overwhelmed (Cardon, 2014). The millennial generation's social/relational issues are a result of overinvolved, controlling, and protective parents, which may inhibit the individualization and independence of the millennial student. The millennial generation has become the "want it all" and "want it now" generation, especially in relation to work pay and benefits, career advancement, work/life balance, interesting work, and being able to make a contribution to society (Lerzan & Ruth, 2013).

Past Academic Performance

Astin (1997) has suggested that of all the entering characteristics that are readily available, high school GPA is the most useful in predicting retention and accounts for 8.6% of the variance in student retention. According to Bean and Metzner (1985), students with poor academic performance are expected to leave an institution at higher rates and college grade point average is expected to be based primarily on high school academic performance. High school percentile rank is used as an indicator of past academic achievement and has an influence on retention decisions by affecting college grade point average (Bean & Metzner, 1985).

Standardized test scores and high school grades have consistently been shown to be among the strongest predictors of retention and degree attainment among undergraduates (Astin & Oseguera, 2012). Standardized tests, such as SAT and ACT, scores as well as high school grade point average are used as a predictor of student retention based on the notion that students who have performed well in high school or on a standardized test are likely to find the academic demands of college less overwhelming and should be able to adjust quickly to college life (Crede & Niehorster, 2012). In addition, scores on entrance exams are reflective on student's general cognitive ability and should be predictive of a student's adjustment because cognitive ability reflects a student's ability to process information and rapidly acquire new skills while high school grades are reflective of a student's sound academic skills (Crede & Niehorster, 2012).

Nonacademic Factors

Students may still leave an institution despite high academic factors, if they perceive low levels of utility, satisfaction, goal commitment or have high levels of stress (Bean & Metzner, 1985). A student's experiences, both in and out of college, can influence the attitudes students have about their education and ultimately their decision to continue with their degree (Bean &

Metzner, 1985). According to Tinto's (1975) Student Integration Model, the more a student interacts with an institution, the more likely the student will be committed to staying.

Institutional commitment and educational goals have an impact of a student being retained by a university by taking into account a student's educational goals of completing a degree. A student's adjustment to college is likely to have an impact on a student's college experience and a student's decision to stay. College and universities tailor programs to influence a student's adjustment by helping students form relationships, learn about support resources, and teach students of the academic demands that they are likely to face (Crede & Niehorster, 2012).

What a student experiences while in college also plays a role in their retention status to the next semester (Purdie & Rosser, 2011). The experiences that have been found to have the most powerful influence on first-year retention include: first semester academic performance; interaction with faculty and peers; initial major; financial aid; time commitments; satisfaction; campus climate; first-year experience courses; and living learning communities (Purdie & Rosser, 2011). A student's academic performance (i.e., grade point average) in the first semester of college appears to be the best predictor of student persistence (Purdie & Rosser, 2011). Students who are not performing well in college are generally the ones who will drop out. The freshmen year of college is generally difficult for students as they are adjusting to the new expectations of college, balancing a variety of responsibilities with desired extracurricular activities, figuring out how to manage their time effectively, feeling academically underprepared and low in academic self-efficacy, and worrying about financial matters (D'Lima, Winsler, & Kitsantas, 2014).

Enrollment Status

Students are considered part-time at an institution, if they are enrolled in less than 12 credit hours in a semester. Evidence suggests that students who were enrolled on a part-time versus full-time basis were more than likely to leave an institution (Bean & Metzner, 1985). Part-time students may respond to financial and time constraints significantly different than students who are enrolled full-time because it may have a greater effect to them personally (MacCann, Fogarty, & Roberts, 2012). Demographically, part-time students are more likely to be older, married, and financially independent, but with relatively disadvantaged academic and economic backgrounds (Darolia, 2014). In addition, part-time students may enjoy lower per-term costs of attendance and greater flexibility to undertake nonacademic activities such as working due to being enrolled in less semester hours (Chen & Carrol, 2007). Part-time students are associated with lower levels of perseverance and may face different barriers to access financial aid and ways to pay for tuition (Darolia, 2014). As well as age, part-time students differ from full-time students in several other important ways. Demographically, part-time students are more likely to be female and to be employed full-time and because of this part-time students are more likely than full-time students to have competing demands from work and children that may overtake study and school time (MacCann et al., , 2015). Part-time students frequently claim that lack of time is the primary barrier to success, including retention (MacCann et al., 2015). Part-time students also attend many different colleges (Jacoby, 2014). Course selections are based off of ease, time, and convenience. Institution selections are based off of what works best at the time of need. The educational goals of part-time students are similar to those of traditional students. However, the lives of the part-time students consist of balancing many competing commitments, including work, family, and other responsibilities (Jacoby, 2014). Therefore, part-time students cannot be as involved in college life as traditional students. It becomes the responsibility of

colleges and universities to design curricular and co-curricular tools to involve part-time students into the institution (Jacoby, 2014). Part-time students face the same challenges of traditional students that include balancing competing demands, dealing with multiple stressors, feeling small, mastering skills, maintaining self-esteem, and handling the academic life and life transitions (Jacoby, 2014). Work and family issues will arise, ranging from job loss to promotion, from new babies to elder care needs, from unanticipated academic challenges to unexpected opportunities (Jacoby, 2014). The extent to which a student feels connected to an institution both academically and socially will make a difference in whether a part-time student can overcome any challenges and return to the university (Jacoby, 2014).

Ethnicity

The efforts for college access and creating college enrollments that are more diverse have been successful over the past years (Keels, 2013). However, merely access to college is not enough and more attention needs to be paid to what happens after college enrollment. According to Keels (2013), a vast majority of Black and Latino students attend predominately white institutions (PWIs) with 83% of Black students attending PWIs and there are only a limited enrollment number of Latino high-enrollment institutions. Bean and Metzner (1985) stated that Black students are often retained at a lower rate than White students but Black students may show a higher rate of retention than white students when high school academic ability levels were controlled. Cochran et al. (2014) suggested that when only race is considered in retention of students, African American, Hispanics, and American Indians were more at risk than White students for leaving an institution, however, when multiple variables such as age and GPA are included, the risk of leaving is reduced. Witkow, Gillen-O'Neel, and Fuligni (2012) found that Latino students are less likely than European-American students to persist towards four-year

degrees, whereas Asian-American youth are more likely to enroll and persist at higher levels than European-American and Latino students.

There are several demographic and social factors that contribute to the challenges that minority students face. Minority students are often transitioning from racially segregated neighborhoods and high schools (Keels, 2013). Minority students often report heightened feelings of social isolation, personal dissatisfaction, and stress and often view their college environment more negatively (Keels, 2013). Because minority students are often first-generation college students, the college-related support received from home is often minimal (Keels, 2013). European-American college students are known to have more informal social groups on campus than Latino and Asian students who often have more off-campus ties (Witkow et al., 2012). Latino college students have also been found to more than likely live at home than students from other ethnic backgrounds, both for financial reasons and because of their closer family ties and obligations (Witkow et al., 2012). Studies have suggested that in general, ethnic minority students report lower levels of belongingness at their university and are therefore more likely to leave an institution (Witkow et al., 2012; Johnson et al., 2007; Nagasawa & Long, 1999; Ostrove & Long 2007).

Gender

Beginning in 1981, there was a huge change in gender equality in education when women reached and surpassed men in terms of graduation rates and since this time colleges and universities have awarded more degrees to women (Ewert, 2012). However, because men and women still have distinctive roles in the environment outside of college, this may have an effect on enrollment and retention decisions (Bean & Metzner, 1985). Research has suggested that women receive a higher investment return on education than men and therefore are less likely to

drop out of school (Cochran et al., 2014). Also, research suggests that persistence rates for female students tend to be higher than for male students (Purdie & Rosser, 2011). Males have been found to report higher levels of loneliness and social alienation at college than females and there is evidence that female students tend to identify with school more strongly than male students (Witkow, Gillen-O'Neel, & Fuligni, 2012). Kimmel, Gaylor, and Hayes (2014) suggested that women and men share similar aspirations in obtaining a degree, but may have different roadblocks to degree completion, which could partially explain the differences in persistence and retention for males and females. Life events and relationships, such as caretaking and family responsibilities, also can have an effect on female persistence and retention in higher education (Kimmel et al., 2014). Research suggests that individual goals determine persistence and retention decisions, and that the decisions of females are based on different values than the decisions of men (Kimmel et al., 2014). Currently, women are more likely than men to earn bachelor's degrees among most racial and ethnic groups and across all levels of the socioeconomic distribution (Ewert, 2012). Research has suggested that women caught up to men in college graduation rates as a result of declining discrimination, occupational restructuring, changing norms, patterns of family formation, and increasing returns to college degrees for women, all of which encouraged increased educational attainment for women relative to men (Ewert, 2012).

Parental Background

Parent's level of formal education has been deemed a powerful predictor of student persistence and retention among the various indicators of parental socioeconomic status that includes parent income, occupation, and education (Bean & Metzner, 1985). One characteristic that defines a first-generation student is a student whose parents have a high school degree or

less and never started college. First generation students face disadvantages compared to peers whose parent(s) attended college (Westbrook & Scott, 2012). First-generation status has been shown to be a predictor of retention before the start of the second year. These students tend to come from families with lower family income and a minority background, most likely African American or Hispanic (Westbrook & Scott, 2012). They also tend to have more dependents and lower incomes. These hurdles faced by first generation students must be overcome and addressed before these students will persist to the second year of college. Walsh and Robinson Kurpis (2016) suggested that parents' educational attainment, their attitude about education, and their support for education impact how a student identifies the value of degree completion and inform their retention decisions.

Socioeconomic status

Socioeconomic status, that includes parent educational attainment and family income, also aids institutions to determine whether a student needs to work in addition to receiving financial aid (Lotkowski, Robbins, & Noeth, 2004). Students from low socioeconomic status show lower achievement due to the barriers that they face such as lack of economic resources, low parental involvement, and limited access to high quality educational opportunities (Huang, 2015). This type of social capital—privileged knowledge, resources and information attained through social networks—is important in higher education because it can be used to make educational decisions (Soria & Stebleton, 2012). First-generation students lack social capital related to being successful in a university because they are unable to obtain it from their parents (Soria & Stebleton, 2012). Students who lack social capital may not be aware of the many benefits that academic and social engagement can bring to their development and success (Soria & Stebleton, 2012).

First-generation students make up approximately 34% of college or university's freshmen population and only about 73% return in their second year (Lightweis, 2014). The different challenges that first-generation college students face include financial and emotional difficulties, and academic and social experiences (Lightweis, 2014). According to Petty (2014), first-generation students were four times more likely to leave a university without a degree. One major challenge first-generations students come across is the ability to function and thrive in two different worlds: (a) the culture of home; and (b) the culture of higher education (Petty, 2014). The obstacles first-generation students face begin before they leave for college and their parents are not equipped to provide information required for college (Petty, 2014). Other educational barriers of first-generation students include: (a) dissimilar expectations of college; (b) poorer academic skills; (c) lack of social preparation; (d) lack of self-esteem; and (e) more financial constraints (Petty, 2014). First-generation students are less confident in their academic ability and readiness for college work and are more likely to avoid asking questions or seeking faculty help (Soria & Stebleton, 2012). First-generation students tended to have greater confusion over faculty expectations for assignments and discipline-specific academic expectations, in addition to challenges understanding and fulfilling the college student role (Soria & Stebleton, 2012).

The financial constraints some students experience puts them in a position to commute back and forth to school instead of living on campus and this may lead them to little time to socialize with other students before or after class and not be involved in learning communities and study groups (Lightweis, 2014). Low-income and first-generation students are less likely to be engaged in the academic and social experiences that foster success in college, such as: (a) studying in groups; (b) interacting with faculty and other students; (c) participating in extracurricular activities; and (d) using support services (Soria & Stebleton, 2012). Students who

have financial problems and need to work may be at a greater risk of dropping out of college than those students who are more financially secure (Lotkowski, Robbins, & Noeth, 2004). This need to work and reluctance to participate in campus life may be due to the lack of knowledge and experience about college from their working-class parents (Lightweis, 2014). Many first-generation students work more hours than their non-first-generation peers and are more likely to drop out of college by the second year (Petty, 2014). Students from low income families may have to divide their time between attending college and working. First-generation/low income students work because of their obligations to support other responsibilities they may have outside of college (Petty, 2014). As a result, they spend more time working and less time studying.

Age

One third of American undergraduate students enrolled in 2011 were considered nontraditional students (students 25 years and older) and this population of nontraditional students is projected to continue to increase significantly (Markle, 2015). Traditional students have been characterized as undergraduates typically under 24 years of age who continue on toward obtaining a college education following high school graduation (Johnson & Kestler, 2013). Nontraditional students typically have taken time away from school and will often find themselves returning to college with life experiences that traditional students are less likely to have had themselves. More specifically, nontraditional students' experiences include having work and career related experiences, many will have been married, and many with children (Johnson & Kestler, 2013).

Though these life circumstances can be seen as barriers in returning to higher education, they may also be the very reasons why nontraditional students achieve at higher levels than traditional students. Because the decision to return to school comes with numerous other

obligations, such as a full time job, financial concerns, children, and a spouse, for those who choose to return to school, their commitment to their education may be stronger due to their sacrifices with these other responsibilities (Jenkins, 2012). This commitment and focus on learning may be the key that contributes to nontraditional students' higher achievement.

Nontraditional students' often have lower levels of campus involvement, dated academic skills, and conflicting roles, but they approach their college experiences with clearer purposes, take the advice of instructors more seriously, connect course content with existing knowledge and personal experiences, and overall are more intent on learning (Johnson & Kestler, 2013).

Younger traditional students tend to value the social aspects of college more than adults, are less serious and less academically motivated than nontraditional students, and focused more on being recognized for earning high grades (Johnson, Taasoobshirazi, Clark, Howell, & Breen, 2016).

Johnson and Kestler (2013) argued that nontraditional students are more self-motivated, perceived by their instructors as being more active learners, and are more focused on gaining knowledge than earning higher grades. Traditional aged college students may still be in a life stage of trying to figure out who they are and how they fit into their environments so their involvement with social outlets on their college campus is far greater than that of nontraditional students (Jenkins, 2012). Older nontraditional students are further removed from campus life due to life responsibilities (i.e. parenting and work) and therefore are less engaged in the social aspects of college which may actually be beneficial to nontraditional students' learning because they would be less distracted while on-campus to focus more of their energy toward learning (Johnson & Kestler, 2013).

High School Preparation

The transition from high school to college can be tough for some students. College under-preparedness can be one reason why the transition can be difficult. One reason for students not being prepared for college is there is a difference and disconnect between what high school teaches and what universities expect (Venezia & Jaeger, 2013). Colleges and universities expect students to enter into postsecondary with college readiness skills that will help them succeed. Leonard (2013) offered four categories of college readiness skills: (a) content knowledge; (b) cognitive strategies such as analysis and problem-solving; (c) academic behaviors such as time management; and (d) contextual skills and knowledge that would familiarize the student with a campus environment. High schools can address these skills by engaging in a variety of strategies. These strategies include: (a) improving the alignment of middle/high school and college curricula; (b) building in extra programs such as college success courses to teach academic behaviors; and (c) melting the boundaries between high school and colleges so students participate in authentic early college course work (Leonard, 2013). In addition to this academic factor of student under preparedness, there are non-academic factors that affect college readiness. A student's family plays an important role in the transition from high school to college by setting expectations and creating conditions. These expectations range from overseeing completion of homework to encouraging extracurricular activities that may or may not affect college readiness (Venezia & Jaeger, 2013). In addition, students who have parents who attended are more than likely to attend a postsecondary institution themselves (Venezia & Jaeger, 2013).

Recent Texas Higher Education Plans

The state of Texas is changing its focus when it comes to higher education. From 2000-2015, many of the higher education initiatives taken on by the Texas Higher Education

Coordinating Board (THECB) and colleges and universities were intended to achieve one or more of the four goals of Closing the Gaps: (a) dramatically increasing participation and success of students in higher education; (b) improving institutional excellence; and (c) increasing the amount of federal research dollars awarded to Texas (THECB, 2016). The THECB believed Closing the Gaps' goals to have been reached by most standards. Texas has now launched 60x30TX, the new higher education strategic plan which aims to position Texas among the highest achieving state in the country and maintain its global competitiveness (THECB, 2016). The 60x30TX strategic plan is entirely student-centered. The plan's primary goal is that 60% of young adults (age 25-34) in Texas will hold some type of postsecondary credential by 2030. The plan also proposes that these graduates will have marketable skills regardless of major and that students will not graduate with debt exceeding 60% of their first-year wages (THECB, 2016).

Closing the Gaps

The Texas Higher Education Plan was adopted in October 2000 by the Texas Higher Education Coordinating Board as the state's 15-year higher education plan. The plan's goals were to close the gaps that existed then in four major areas: participation, success, excellence, and research (THECB, 2016). The Closing the Gaps four goals stated: (a) by 2015, close the gaps in participation rates to add 630,000 more students; (b) by 2015, award undergraduate degrees, certificates, and other identifiable student success from high-quality programs; (c) by 2015, substantially increase the number of nationally recognized programs or services at colleges and universities; and (d) by 2015, increase the level of federal science and engineering research and development obligations to Texas institutions to 6.5% of obligations to higher education institutions across the nation (THECB, 2016).

For the first goal in the plan, participation, statewide enrollment increased by 605,114 from fall 2000 to fall 2015, 96% of the targeted increase of about 630,000 students (THECB, 2016). Hispanic student enrollment increased in fall 2015 by nearly 29,000 students from the previous year (THECB, 2016). However, the increase since 2000 was still about 109,000 short of the increase required to reach the final target (THECB, 2016). In 2015, females participated in higher education at a much greater rate (6.8% of their population) than males (5.3%), a gender gap of 1.5 percentage points that grew from a 1.0 percentage point gap in fall 2000 (THECB, 2016). For the second goal in the plan, success, the state of Texas met the goal of 201,000 undergraduate awards in the 2011 fiscal year, with more than 221,000 bachelor degrees awarded that year for the first goal in the plan, participation, statewide enrollment increased by 605,114 from fall 2000 to fall 2015, 96% of the targeted increase of about 630,000 students (THECB, 2016). Hispanic student enrollment increased in fall 2015 by nearly 29,000 students from the previous year (THECB, 2016). Degree awards by public, independent, and career institutions continued to grow since 2011 reaching 258,795 in 2015, almost 143,000 more than in 2000 (THECB, 2016). Hispanic students earned nearly 30% of all bachelor's degrees awarded by public institutions in 2015, up from 18.5% in 2000 (THECB, 2016). Texas institutions reached six of the nine final targets related to the success goal in 2011, 2012, and 2013. For the third goal, excellence, The University of Texas at Austin tied for the number 1 among American public research, universities, based on nine measures of research performance compiled by the Center for Measuring University Performance (THECB, 2016). For the fourth goal, research, the state has made no net progress in reaching this goal (THECB, 2016). In 2000, Texas had 5.5% of national science and engineering research and development obligations and the share was stuck at 5.0% in 2013 and 2014 (THECB, 2016).

60x30TX

The new higher education plan, 60x30TX focuses on helping students succeed by striving for 60% of the 25-34 year old Texas population to hold a certificate of degree by 2030 and with less debt (THECB, 2016). The strategic plan focuses on four goals: (a) by 2030, at least 60% of Texas ages 25-34 will have a certificate or degree; (b) by 2030, at least 550,000 students in that year will complete a certificate, associate, bachelor's, or master's from an institution of higher education in Texas; (c) by 2030, all graduates from Texas public institutions of higher education will have completed programs with identified marketable skills; and (d) by 2030, undergraduate student loan debt will not exceed 60% of first-year wages for graduates of Texas public institutions (THECB, 2016).

The first goal in the plan, 60x30TX, aims to increase the percentage of 25-34 year olds in Texas who hold a certificate or degree. The goal focuses on 25-34 year olds as an indicator of the economic future of the state and its ability to remain globally competitive (THECB, 2016). The state of Texas has seen a relative decline in educational attainment among this younger population. The second goal in the plan, completion, complements the 60x30TX goal by supplying graduates of all ages from all two- and four-year higher education institution in Texas. The state will need to continue the degree production increases of recent years to reach the completion goal. Continued growth in certificates and degrees among postsecondary institutions is critical for reaching the 60% in the 60x30TX goal and educating a skilled workforce (THECB, 2016). The third goal in the plan, marketable skills, highlights the value of higher education in the workforce. Students need to be made aware of the marketable skills embedded in their academic programs, and higher education institutions must make certain that students graduate with marketable skills (THECB, 2016). The fourth goal, student debt, aims to helps students who

graduate with debt complete their degrees with manageable debt. The goal seeks to balance the level of student loan debt with earning potential the first year after college (THECB, 2016).

Conclusion

Retention can be viewed as a roadblock for many colleges and universities. Incoming student backgrounds, academic progress, financial resources, on campus experiences and motivation can all have an impact on reasons why a student leaves an institution. Astin (1970) emphasized the need to have an understanding of student qualities and characteristics as they enter into college, the type of educational environments with which they have while at a university, and their qualities and characteristics as they exit the institution in order to be able to fully evaluate an institution's effectiveness. The goal of this study is to develop a prediction model that will take into account the many different variables that can affect a student's decision to persist at an institution.

CHAPTER III: METHOD

Introduction

The purpose of the study was to examine which pre-college variables best predict retention for the first-time-in-college freshman (FTICF) in a public Hispanic Serving Institution in South Texas. This chapter describes the research method, including the design, assumptions, subject selection, instrumentation, data collection, and data analysis.

Research Design

The study is *ex post facto* as a quasi-experimental design. The data currently exists and will be examined as to their relationship to outcomes. Descriptive statistics will be used to provide a summary of results. Descriptive statistics help data in meaningful and convenient ways (Coladarci, Cobb, Minium & Clarke, 2008). Logistic regression will be used for analyses. Each independent variable (predictor) is evaluated with regard to its predictive power in light of all other independent variable. The study's predictive variables (independent variables) are 13 pre-college variables, which include: (a) age; (b) gender; (c) ethnicity; (d) high school percentile; (e) SAT/ACT score; (f) first generation status; (g) admission status; (h) STAAR college readiness score; (i) STAAR writing score; (j) STAAR math score; (k) TSI reading score; (l) TSI math score; and (m) TSI writing score. Additionally, logistic regression is used when the dependent variable has categorical data with two or more categories (Pallant, 2013). The outcome variable (dependent variable) is the student's retention to the following year based on full-time status.

Assumptions

Regression statistics must meet particular assumptions before data can be considered appropriate for further analyses. First, normality refers to variables being normally distributed. This allows for accuracy in explanation and prediction in both the relationship and significance

tests. Second, linearity should show a straight-line relationship between independent and dependent variables. Predicted values are equal at all levels of the dependent variable. The variance of error should not be greater for some predictors than for others, otherwise standard deviation may be overestimated or understated. Third, homoscedasticity should show that errors are the same across all levels of predictors. A lack of homoscedasticity can show a distortion of findings and lead to an increase of accepting results are true. Fourth, multicollinearity occurs when predictors are not independent of each other. They, in essence, are similar to their measurements of a construct (Leech, Barret, & Morgan, 2008; McClendon, 1994; Osborne & Waters, 2002). All assumptions will be examined during statistical analyses.

Subject Selection

The study takes place in a public university in South Texas, which serves approximately 8,300 students. The university is a designated Hispanic-Serving Institution with student demographics that represent the area with 62% of the students as Hispanic and 27% as White. The university has between 1,000 and 1,300 first-time-in-college incoming freshmen annually. In the fall 2012 semester, there were 1,272 FTICF students, 1, 214 FTICF students in the fall 2013 semester, and 1,097 FTICF students in fall 2014 semester. The sample size is sufficient for statistical analyses (Van Voorhis & Morgan, 2007) related that the minimum number of subjects for regression is 50. However, when the number of predictors exceed six, there should be 10 subjects per predictor beyond 50. Therefore, the number of subjects should exceed 180 for this study. Due to the non-probability nature of sampling, external validity is limited to the study's first-time-in-college freshmen. Permission to conduct the study will be obtained from the Institutional Review Board at Texas A&M University-Corpus Christi.

Instrumentation

The availability and accessibility of the data at the University are from the 2017 data base. The data will consist of information that is self-reported on the student's admissions application and information that is from the university student information systems database.

Age

A student's age is reported on the admissions application and is determined by the student's birth date. A student's age will show which age group best predict academic success.

Gender

A students' gender is reported on the admissions application. Women are perceived to more than likely return to an institution.

Ethnicity

A student's ethnicity is self-reported on the admissions application. Studies have shown that Hispanic and African American students have had lower graduation rates than Asian and Caucasian students (Raju & Schumacker, 2014).

High School Percentile

High school percentile is information obtained from the student's final high school transcript. Studies have shown that students who have lacked academic ability are more likely to leave an institution (Raju & Schumacker, 2014).

SAT/ACT Score

A Scholastic Aptitude Test (SAT) score or an American College Test (ACT) score is required by the office of admissions in order to be accepted into the university. Official SAT and ACT scores are submitted to the admissions office. ACT scores will be converted into SAT

scores using the College Board SAT-ACT concordance tables. The SAT and ACT are common assessments that are used to determine college readiness (Venezia & Jaeger, 2013).

First-Generation Status

A student is asked in the admissions application if s/he is a first-generation college student by asking if their parents had attended college. A first generation student who does begin college has difficulty remaining enrolled and is twice as likely as peers to leave college without a degree (Westbrook & Scott, 2012).

Admission Status

Students are admitted into the university and coded with an admission status. Students can be either fully admitted or admitted under alternate admissions. Students admitted as alternate admissions did not meet the regular admission requirements.

STAAR College Readiness Score

A final high school transcript with State of Texas Assessments of Academic Readiness scores is required by the office of admissions in order to be accepted into the university. Official STAAR scores are submitted to the admissions office. The STAAR measures the understanding of academic skills specific content knowledge necessary for college and career readiness (TEA, 2015).

STAAR Writing Score

A State of Texas Assessments of Academic Readiness (STAAR) writing score is required by the office of admissions before enrolling in college level courses. Official STAAR scores are submitted to the admissions office. The STAAR measures the understanding of academic skills specific writing content knowledge necessary for college and career readiness (TEA, 2015).

STAAR Math Score

A State of Texas Assessments of Academic Readiness (STAAR) math score is required by the office of admissions before enrolling in college level courses. Official STAAR scores are submitted to the admissions office. The STAAR measures the understanding of academic skills specific math content knowledge necessary for college and career readiness (TEA, 2015).

TSI Reading Score

A Texas Success Initiative (TSI) reading score is required by the office of admissions before enrolling in reading intensive college level courses. Official TSI scores are submitted to the admissions office. The TSI Assessment measures your strengths and weaknesses in reading and is an indicator of how ready you are to handle college-level courses (TSI, 2015).

TSI Math Score

A Texas Success Initiative (TSI) math score is required by the office of admissions before enrolling in math intensive college level courses. Official TSI scores are submitted to the admissions office. The TSI Assessment measures your strengths and weaknesses in mathematics and statistics and is an indicator of how ready you are to handle college-level courses (TSI, 2015).

TSI Writing Score

A Texas Success Initiative (TSI) writing score is required by the office of admissions before enrolling in writing intensive college level courses. Official TSI scores are submitted to the admissions office. The TSI Assessment measures your strengths and weaknesses in writing, and is an indicator of how ready you are to handle college-level courses (TSI, 2015).

Retention

A student who has been retained is one who has continued enrollment within the same higher education institution from the fall to fall semester of a student's first to second year or college.

Data Collection

The data for the abovementioned variables were obtained from the University's office of institutional research. Permission to use the data for the purpose of the study will be obtained from the University. The university data base is Banner by Ellucian, an integrated software system with applications in student information and financial aid services. The university collects data when students submit an application through the ApplyTexas online application. The process for requesting data is to submit an institutional review board (IRB) application for approval at the university.

Data Analysis

The raw data was exported into the Statistical Package for the Social Sciences (SPSS), which was used for the purpose of analysis and data manipulation. The data was analyzed and summarized, using descriptive statistics. Descriptive statistics are used to organize and describe the characteristics of a collection of data in the study (Salkind, 2014). Descriptive statistics describes what the data shows and patterns that might arrive from the data. Data will then be analyzed according to assumptions and logistic regression. Assumptions will be examined accordingly:

- Normality: Independent and dependent variables can be assessed according to kurtosis and skewness scores. Additionally, a scatterplot with a normal distribution line will show results (Osborne & Waters, 2002).

- **Linearity:** Standardized residuals (error) are plotted with predicted values (dependent variable) to show linear or curvilinear relationship. It should be linear in order to estimate a true relationship. A non-linear relationship under-estimates the relationship. A scatter plot will indicate the results (Osborne & Waters, 2002).
- **Homoscedasticity:** Residual (error) values can be observed on a histogram as fitted around a horizontal line. Errors should be randomly scattered around the line. Non-homoscedasticity can lead to decisions based on faulty data (Osborne & Waters, 2002).
- **Multicollinearity:** Multicollinearity occurs when independent variables are highly correlated, for example, .9 and above (Osborne & Waters, 2002; Pallant, 2013).

Checking multicollinearity can be accomplished by a number of tests:

- **Correlation matrix:** Pearson's bivariate correlation can be examined for high correlations with statistical significance.
- **Tolerance:** It is the measure of the influence of one independent variable on the others. It is calculated as $T = 1 - R^2$. Higher scores show lower tolerance: $T < .1$ shows the possibility of multicollinearity, whereas $T < .01$ shows high multicollinearity.
- **Variance Inflation Factor (VIF):** VIF is calculated as $VIF = 1/T$. Large scores show multicollinearity scores larger than 10 tend to indicate multicollinearity. Higher scores indicate greater multicollinearity.

Logistic regression was used to describe the data and predict the relationship between one dependent dichotomous variable and one or more independent variables (Creswell, 2013).

Logistic regressions have several statistical benefits. First, it allows an assessment of how well independent variables explains or predicts a dichotomous dependent variable. Second, it assesses

the adequacy of the independent variables for the model by examining goodness of fit. Third, it summarizes the accuracy of the classification of cases in the model while providing positive and negative predictive values (Pallant, 2013).

Conclusion

This study utilized a quantitative research design. The ex post facto quasi-experimental design is used to examine how an independent variable, that is present prior to the study, affects a dependent variable (Creswell, 2013). A quasi-experimental study means that participants are not randomly assigned (Creswell, 2013). A quantitative study is used to explore, understand, and identify patterns why students leave a higher education institution after their first-year of study. The patterns identified in conducting a quantitative research design can aid in the development of a retention prediction model. A prediction model can be a powerful tool that identifies which FTICF are more at risk for leaving an institution.

CHAPTER IV: RESULTS

The purpose of the study was to examine which pre-college variables best predict retention for the first-time-in-college freshman (FTIC) in a public university in South Texas. The study depended on the age, gender, ethnicity, high school percentile, ACT/SAT scores, and admission status of the FTIC freshmen from the university information system database.

Statistical Assumptions

Data were checked according to statistical assumptions. Assumptions were met with the exception of outliers in one of the statistical analysis. The outliers were deleted and analyses were completed.

Statistical Analysis

The initial statistical analyses for the research questions were to be descriptive statistics and logistic regression. Additionally, chi-square analyses were conducted for research question one, which examined how demographics related to retention of the first-time-in-college freshman. The chi-square statistic examined whether groups differed (were independent) from each other.

Descriptive statistics were calculated for all variables. The SPSS software was used to produce frequency distributions, means, and standard errors when appropriate. The SPSS had analytical capabilities to examine the effectiveness of the independent variables in relation to student characteristics. The researcher used logistic regression and Pearson's chi-square test. Table 1-13 provided descriptive statistics.

Pre-college data were gathered on the fall 2012, fall 2013, fall 2014 FTIC from a South Texas Hispanic Serving Institution and characterized with gender being identified. The results were presented in Table 1.

Table 1

Gender, (N=3445)

<u>Gender</u>	<u>Academic Year 2012</u>		<u>Academic Year 2013</u>		<u>Academic Year 2014</u>	
	<u>Frequency</u>	<u>Percentage</u>	<u>Frequency</u>	<u>Percentage</u>	<u>Frequency</u>	<u>Percentage</u>
Male	678	56.9	684	57.5	592	55.6
Female	513	43.1	505	42.5	473	44.4
Total	1191		1189		1065	

Pre-college data were gathered on the fall 2012, fall 2013, fall 2014 FTIC from a South Texas Hispanic Serving Institution and characterized with ACT/SAT Rank being identified. The top 10% of students in the class rank category was not included due to too few cases. ACT/SAT score was placed into five categories from the original 100-point scale. The results are presented in Table 2.

Table 2

ACT/SAT Rank, (N=3445)

<u>ACT/SAT</u> <u>Score</u>	<u>Academic Year 2012</u>		<u>Academic Year 2013</u>		<u>Academic Year 2014</u>	
	<u>Frequency</u>	<u>Percentage</u>	<u>Frequency</u>	<u>Percentage</u>	<u>Frequency</u>	<u>Percentage</u>
Top 10%	128	10.7	90	7.6	25	2.3
11-25%	209	17.5	223	18.8	200	18.8
26-50%	412	34.6	385	32.4	420	39.4
51-75%	268	22.5	274	23.0	246	23.1
75-100%	165	13.9	205	17.2	167	15.7
Unknown	9	.8	12	1.0	7	.7
Total	1191		1189		1065	

Pre-college data were gathered on the fall 2012, fall 2013, fall 2014 FTIC from a South Texas Hispanic Serving Institution and characterized with retention status being identified. The results are presented in Table 3.

Table 3

Retention Status, (N=3445)

<u>Retention</u>	<u>Academic Year 2012</u>		<u>Academic Year 2013</u>		<u>Academic Year 2014</u>	
	<u>Frequency</u>	<u>Percentage</u>	<u>Frequency</u>	<u>Percentage</u>	<u>Frequency</u>	<u>Percentage</u>
Retained	755	63.4	760	63.9	736	69.1
Not Retained	436	36.6	429	36.1	329	30.9
Total	1191		1189		1065	

Pre-college data were gathered on the fall 2012, fall 2013, fall 2014 FTIC from a South Texas Hispanic Serving Institution and characterized with class rank being identified. The results are presented in Table 4.

Table 4

Class Rank, (N=3445)

<u>Class Rank</u>	<u>Academic Year 2012</u>		<u>Academic Year 2013</u>		<u>Academic Year 2014</u>	
	<u>Frequency</u>	<u>Percentage</u>	<u>Frequency</u>	<u>Percentage</u>	<u>Frequency</u>	<u>Percentage</u>
Top 10%	14	1.2	3	.3	4	.4
11-25%	42	3.5	35	2.9	40	3.8
26-50%	252	21.2	233	19.6	211	19.8
51-75%	419	35.2	446	37.5	374	35.1
75-100%	402	33.8	412	34.7	389	36.5
Unknown	62	5.2	60	5.0	47	4.4
Total	1191		1189		1065	

Pre-college data were gathered on the fall 2012, fall 2013, fall 2014 FTIC from a South Texas Hispanic Serving Institution and characterized with age being identified. Age was recoded to place the 19-24 year old students into one category. Age 25 and over was not included due too few cases in that category. The results are presented in Table 5.

Table 5

Age, (N=3445)

<u>Age</u>	<u>Academic Year 2012</u>		<u>Academic Year 2013</u>		<u>Academic Year 2014</u>	
	<u>Frequency</u>	<u>Percentage</u>	<u>Frequency</u>	<u>Percentage</u>	<u>Frequency</u>	<u>Percentage</u>
18 yrs	897	75.3	892	75.0	798	74.9
19-24 yrs	294	24.7	181	24.6	258	24.2
25+			5	.4	9	.8
Total	1191		1189		1065	

Pre-college data were gathered on the fall 2012, fall 2013, fall 2014 FTIC from a South Texas Hispanic Serving Institution and characterized with ethnicity being identified. Ethnicity was compared into two categories with the first comparison of ethnicity in four categories. The ethnicity data gathered from the institution came in nine categories that included: (a) Hispanic; (b) White; (c) Asian; (d) Black; (e) International; (f) Multi-Racial; (g) American-Indian; (h) Native-American; and (i) unknown. Ethnicity was recoded into four categories for comparison of other ethnicities to Hispanic. The results of Ethnicity in four categories are presented in Table 6.

Table 6

Ethnicity 4 Categories, (N=3445)

<u>Class Rank</u>	<u>Academic Year 2012</u>		<u>Academic Year 2013</u>		<u>Academic Year 2014</u>	
	<u>Frequency</u>	<u>Percentage</u>	<u>Frequency</u>	<u>Percentage</u>	<u>Frequency</u>	<u>Percentage</u>
Hispanic	823	69.1	819	68.9	770	72.3
White	224	18.8	230	19.3	168	15.8
Black	95	8.0	106	8.9	96	9.0
Other	49	4.1	34	2.9	31	2.9
Total	1191		1189		1065	

Pre-college data were gathered on the fall 2012, fall 2013, fall 2014 FTIC from a South Texas Hispanic Serving Institution and characterized with ethnicity being identified. Ethnicity was compared into two categories with the second comparison of ethnicity in two categories. The ethnicity data gathered from the institution came in nine categories that included: (a) Hispanic; (b) White; (c) Asian; (d) Black; (e) International; (f) Multi-Racial; (g) American-Indian; (h) Native-American; and (i) unknown. Ethnicity was recoded into two categories for comparison of other ethnicities to Hispanic. The results of Ethnicity in two categories are presented in Table 7.

Table 7

Ethnicity 2 Categories, (N=3445)

<u>Ethnicity</u>	<u>Academic Year 2012</u>		<u>Academic Year 2013</u>		<u>Academic Year 2014</u>	
	<u>Frequency</u>	<u>Percentage</u>	<u>Frequency</u>	<u>Percentage</u>	<u>Frequency</u>	<u>Percentage</u>
Hispanic	823	69.1	819	68.9	770	72.3
Other	368	30.9	370	31.1	295	27.7
Total	1191		1189		1065	

Pre-college data were gathered on the fall 2012, fall 2013, fall 2014 FTIC from a South Texas Hispanic Serving Institution and characterized with admission decision being identified. The admission data gathered from the institution came in six categories that included: (a) alternate admission; (b) accepted; (c) final admission; (d) admit (registration exists); (e) special admission; and (f) cancelled acceptance. Only three categories were used for admission decision due to few cases in the other categories. The results of were presented in Table 8.

Table 8

Admission Decision, (N=3445)

<u>Decision</u>	<u>Academic Year 2012</u>		<u>Academic Year 2013</u>		<u>Academic Year 2014</u>	
	<u>Frequency</u>	<u>Percentage</u>	<u>Frequency</u>	<u>Percentage</u>	<u>Frequency</u>	<u>Percentage</u>
Alternate	252	21.2	190	16.0	317	29.8
Accepted	144	12.1	124	10.4	46	4.3
Final	795	66.8	875	73.6	702	65.9
Total	1191		1189		1065	

General Results

The purpose of the research was to examine which pre-college variables predict retention for the first-time-in-college freshman. Although the prediction model was statistically significant and the model adequacy was confirmed, the variables only minimally explained retention. The omnibus tests of model coefficients showed the overall model was statistically significant, $\chi^2(17, N=3385) = 242.76, p < .001$. The Hosmer and Lemeshow Test confirms the adequacy of the model: $\chi^2(17, N=3385) = 10.31, p = .244$. However, the model only explained 6.9% to 9.6% of the variance (dependent variable): $-2 \log \text{likelihood} = 4110.31$, Cox & Snell R-square = .069 and

Nagelkerke R square = .096. Moreover, the current retention rate is 65.7% and the predicted value only changed + .5% to 66.2%.

The results also showed how well the students were classified within the retention variable. The positive predictive value was 68.03%, indicating students predicted to be retained. This means the model correctly classified 68.03% of those students to be retained. Additionally, the negative predictive value was 52.17%, indicating that of the students predicted not to be retained, the model accurately classified 52.17% of them. The results are presented in Table 9.

Table 9

Classification Table, (N=3385)

<u>Retention Status</u>	<u>Retained</u>	<u>Not Retained</u>	<u>Percentage Correct</u>
Retained	2037	187	91.6
Not Retained	957	204	17.6
Total	2994	391	
Overall Percentage			66.2
	Positive Predictive Value 2037/2994=.6803	Negative Predictive Value 204/391=.5217	

Overall, the results showed statistical significance. They were predictive of retention for the first-time-in-college freshman. However, the predictors only explained less than 10% of the outcome. In addition, the results only predicted an increase of ½ of 1% for the predictors to increase retention. Although the model was statistically significant, its utility for actual retention is questioned. Conclusions will be drawn in chapter five. In the meantime, specific results from statistical analyses are provided below.

Research Questions

RQ 1: Demographics

How are demographics (age, gender, and ethnicity) related to the retention of the first-time-in-college freshman? Results for the statistical analysis for each individual question were presented.

Research Question 1.1: How is age related to the retention of the first-time-in-college freshman? Table 10 shows a summary of the results.

Table 10

Chi-Square of Age and Retention

<u>Retention</u>	<u>18 years</u>	<u>19-24 years</u>	χ^2	p	<u>Effect Size</u>
<u>Academic Year</u>					
2012			.773	.379	.026
Retained	572	176			
Not Retained	322	112			
2013			5.584	.018	.069
Retained	582	166			
Not Retained	303	120			
2014			2.062	.151	.044
Retained	563	168			
Not Retained	234	87			

For academic years 2012, 2013, and 2014 students who were 25 years and older were not included because there were too few cases. For academic years 2012 and 2014 there was no statistically significant differences in age for retention. For academic year 2013 age was statistically significant. Students 18 years old differ from students 19-24 years old for retention: $\chi^2 = (1, N=1171) = 5.584, p < .05$. Students who are 18 years old are more likely to be retained: Residuals (18 years = .7, 19-24 years = -1.2: not retained 18 years = -.9, 19-24 years = 1.6). Although there is statistical significance, the effect size is minimal, .06.

Research Question 1.2: How is gender related to the retention of the first-time-in-college freshman? Table 11 shows a summary of the results.

Table 11

Chi-Square of Gender and Retention

<u>Retention</u>	<u>Females</u>	<u>Males</u>	χ^2	<i>p</i>	<u>Effect Size</u>
<u>Academic Year</u>					
2012			1.199	.273	-.032
Retained	333	412			
Not Retained	179	255			
2013			1.797	.180	-.039
Retained	329	419			
Not Retained	169	254			
2014			.367	.544	-.019
Retained	329	402			
Not Retained	138	183			

For academic year 2012, 2013, and 2014 there were no statistically significant differences in gender for retention. Males and females do not differ for retention.

Research Question 1.3: How is ethnicity related to the retention of the first-time-in-college freshman? Table 12 shows a summary of the results.

Table 12

Chi-Square of Ethnicity and Retention

<u>Retention</u>	<u>Hispanic</u>	<u>White</u>	<u>Black</u>	<u>Other</u>	χ^2	<i>p</i>	<u>Effect Size</u>
<u>Academic Year</u>							
2012					2.710	.439	.048
Retained	508	151	59	30			
Not Retained	311	73	36	14			
2013					6.077	.108	.072
Retained	526	144	58	20			
Not Retained	286	83	48	6			
2014					5.182	.159	.070
Retained	535	115	57	24			
Not Retained	228	50	37	6			

For academic year 2012, 2013, and 2014 there were no statistically significant differences in ethnicity for retention. Hispanic, White, Black, or Other do not differ for retention.

RQ 2: Pre-college Variables

What pre-college variables are predictors of the retention of the first-time-in-college freshman? Results for the statistical analysis for each individual question were presented.

Research Question 2.1: How well does high school percentile (high school rank) predict of the retention of the first-time-in-college freshman? Table 13 shows a summary of the results.

Table 13

High School Percentile Prediction of Retention

<u>Class Rank</u>	<u>B</u>	<u>df</u>	<u>Wald χ^2</u>	<u>p</u>	<u>SE</u>	<u>Exp(B)</u>
11-25%	-.009	1	.002	.964	.205	.991
26-50%	-.504	1	6.182	.013*	.203	.604
51-75%	-1.13	1	27.962	.000**	.210	.329
75-100%	-.131	1	.259	.000**	.258	.877

*statistically significant at $< .05$

** statistically significant at $< .001$

Overall high school percentile predicted whether students were retained or not: Wald $\chi^2(4) = 95.62, p < .001$. However, not all class rank categories were predictive. Additionally, the B values for statistically significant predictors show the direction and likelihood of retention. The higher the number and the negative direction indicate the greater the proportion of students in those categories the more likely they are not to be retained. Moreover, the Exp(B) values indicate the odds of being retained. Those students in the categories 26-100% high school percentile are less likely to be retained than those in the 11-25% category. The lower the value (less than 1) the more likely they are not to be retained when compared to the 11-25% category. The top 10% category was not included in the results because there were too few cases for analysis.

Research Question 2.2: How well do SAT/ACT scores predict of the retention of the first-time-in-college freshman? Table 14 shows a summary of the results.

Table 14

ACT/SAT Rank Prediction of Retention

<u>ACT/SAT</u>	<u>B</u>	<u>df</u>	<u>Wald χ^2</u>	<u>p</u>	<u>SE</u>	<u>Exp(B)</u>
Top 10%	-.224	1	2.001	.157	.159	.799
11-25%	-.372	1	5.572	.018*	.158	.689
26-50%	-.590	1	11.755	.001**	.172	.554
51-75%	-.830	1	18.647	.000**	.192	.436
75-100%						

*statistically significant at $< .05$

** statistically significant at $< .001$

Overall ACT/SAT rank predicted whether students were retained or not: Wald $\chi^2(4) = 24.86, p < .001$. However, not all ACT/SAT rank categories were predictive. Additionally, the B values for statistically significant predictors show the direction and likelihood of retention. The higher the number and the negative direction indicate the greater the proportion of students in those categories, the more likely they are not to be retained. Moreover, the Exp(B) values indicate the odds of being retained. Those in the 11-100%, ACT/SAT rank are less likely to be retained than those in the top 10% category. The lower the value (less than 1) the more likely they are not to be retained when compared to the top 10% category.

Research Question 2.4: How well does admission status predict of the retention of the first-time-in-college freshman? Table 15 shows a summary of the results.

Table 15

Admission Status Prediction of Retention

<u>Admission Status</u>	<u>B</u>	<u>df</u>	<u>Wald χ^2</u>	<u>p</u>	<u>SE</u>	<u>Exp(B)</u>
Alternate	.522	1	10.558	.001*	.161	1.686
Accepted	-.035	1	.094	.759	.115	.965
Final	.346	1	2.133	.144	.237	1.414

* statistically significant at $< .001$

Overall, a student's admission status predicted whether students were retained or not: Wald $\chi^2(4) = 18.19, p < .001$. However, not all admission status categories were predictive. Only those students whose admission status was classified as alternative was statistically significant.

Research question 2.3 dealt with a student's first generation status. However, the university data did not include first generation status due to students not reporting that information to the institution. Research questions 2.5 through 2.10 dealt with students' high school STAAR exam results and Texas Success Initiative test scores and their predictive values toward retention. However, the university's data were incomplete and results and scores were too sparsely recorded to be analyzed. Therefore, no results from data were reported for research question 2.5 through 2.10.

Summary

Chapter Four presented a description of data analyses examining how pre-college variables can predict retention of the first-time-in-college freshman. The purpose of the study is to examine which pre-college variables best predict retention for the first-time-in-college freshman (FTIC) in a public university in South Texas. The first independent variable was demographics; (a) age, (b) gender, and (c) ethnicity. The second independent variable is pre-college characteristics; (a) high school percentile, (b) SAT/ACT score, (c) first-generation status, (d) admission status, (e) STAAR college readiness score, (f) STAAR writing score, (g) STAAR mathematics score, (h) Texas Success Initiative reading score, (i) Texas Success Initiative writing score, and (j) Texas Success Initiative mathematics score. The dependent variable is a student's retention to the following year. The study relied on multiple analyses. A description of the findings in tables and statistical form resulted from each of the research questions.

There were multiple analyses for each research question based on the measures for each of the dependent variables. The study used SPSS software to conduct all analyses. The researcher selected to use chi-square tests and logistic regression to examine the effectiveness of the procedure.

The first questions explored the relationship between the demographics of the first-time-in-college freshman with an analysis on retention. Data were analyzed by performing chi-square tests. The second questions explored the relationship between pre-college data with an analysis on retention. Data were analyzed by performing logistic regression analyses.

CHAPTER V: SUMMARY OF RESULTS AND CONCLUSIONS, DISCUSSION, IMPLICATIONS, AND RECOMMENDATIONS FOR FUTURE RESEARCH

The purpose of the study was to examine which pre-college variables best predict retention for the first-time-in-college freshman. The study used pre-existing data from a regional public Hispanic Serving Institution in South Texas institution student information database. The news surrounding retention is both good and bad. The good news is that retention is high on the list of priorities for both college and university administrators, as well as policy makers. There is tremendous concern for implementing better ways to improve student success. The bad news is retention rates, including graduation are not improving (Swail, 2014). The news is more dire when researchers look at first-time-in-college freshmen. Approximately 23% of first-time-in-college students entering a four-year institution will not be retained for their next year (Stewart, Lim, & Kim, 2015). However, before students even arrive on a college campus and in order to implement ways to improve student success, administrators factor various high school performance indicators, such as high school GPA (Astin, 1977), high school percentile rank (Bean & Metzner, 1985), and ACT and SAT scores (Crede & Niehorster, 2012) to get a sense of retention possibilities.

For this study, though, those factors are not the best predictors for first-time-in-college student retention. Although logistic regression results were statistically significant, the predictor variables of GPA, high school rank, and ACT/SAT scores explained less than 10% toward retention. Moreover, the model indicates a 65% retention rate that only predicts a .5% increase using the current predictors. For chi-square calculations, those students who are between 18-24 years of age are more likely to be retained than those 25 years of age or older, but this was for only one year out of three. And, the effect size was very small. This indicates that although the

younger age group is more likely to be retained than the older one, the strength of being retained is minimal. The specific results are presented below, but overall, the results of the study suggest that some high school factors do not predict college retention very well.

Conclusions

This study examined which pre-college variables best predict retention for the first-time-in-college freshman. The following research questions guided this study.

RQ1: How is age related to the retention of the first-time-in-college freshman?

Traditionally, a student continues his or her education by entering into college right after high school graduation. Nontraditional students are considered to be above 25 years of age and returning to school along with other life and family obligations. Astin's (1993) I-E-O model states that a student's outcome (retention) is a function of their input characteristics (age).

The study found that there were no statistically significant differences in age for retention for academic year 2012 and 2014. For academic year 2013 age was statistically significant. In academic year 2013 students who were 18 years old were more likely to be retained, but with statistical significance the effect size is minimal. As students age increases upon entering college, their decision to enter school affects their success at an institution of higher education. Students who are older entering school may have other obligations such as a job, family, or financial concerns. These obligations can lead to a student's commitment to their studies be stronger or may hinder their commitment leading to not being able to complete their studies.

Astin (1993) stated that in order to understand the relationship between processes and outcomes, researchers must also include input variables, which could include a student's age upon entering college. Although students at the age of 24 are considered more mature, they are behaving the same as 18 year old students in terms of retention. The reasons for leaving or

staying in a higher education institution may be for different responsibilities and obligations, but they are making those decisions at the same rate as a student who is 18 years of age.

RQ2: How is gender related to the retention of the first-time-in-college freshman? The workforce in the United States has been increasingly changing in gender ratios in comparison to education and employment. Females are now attending colleges at a higher rate than in the past, making up over half the undergraduate population since 1981 (Haemmerlie & Montgomery, 2012). The opportunities for females to combine family life with a professional life have increased. Females expect high returns from a college degree and the possibility of combining work and family responsibilities (Severiens & ten Dam, 2012). Astin's (1993) I-E-O model suggests evaluating students' inputs, such as gender, may be important to seek for students' outcomes of retention in college.

The study found that there were no statistically significant differences in gender for retention for academic years 2012, 2013, and 2014. Retention of males and females do not differ and in a way suggests that males and females are treated the same at the institution. There are numerous other factors that may affect the retention of males and females. Previous research has found the academic performance of males and females to be similar, except for fields that women are found to be a minority (Severiens & ten Dam, 2012). However, on average, more females are attending higher education institutions and are more successful than males. Males more often have more discipline problems while females are more likely to pay attention in class, work with others, ask for help when needed, and be better organized (Severiens & ten Dam, 2012). In addition, females may outperform males in coursework, but males tend to perform better in exams. Females perform better in social fields while males perform better in technical fields. The interaction of students with peers at the institutional level and in close personal

relationships were linked to retention to a similar extent for both males and females (Severiens & ten Dam, 2012). Academically females may be more successful than males, but the economic benefit of a baccalaureate degree are greater for males (Severiens & ten Dam, 2012). The learner characteristics, family responsibility, institution environment, and structure of the job market seem to impact the percentage of males and females entering into college, though, retention of males and females still remains the same. Although gender may be an important factor for retention, for this study, it does not stand alone as statistically significant. Other factors must also be considered.

RQ3: How is ethnicity related to the retention of the first-time-in-college freshman? The number of postsecondary institutions serving minority students has grown to an unprecedented amount, from 414 in the 1980s to 1,200 by 2004 (Flores & Park, 2013). Universities have stumbled upon a great dilemma in the retention of underrepresented minority students (Payne, Slate, & Barnes, 2013). As a result, universities have dedicated resources toward the recruitment and retention of minority students. Minority students face a vulnerability at an institution due to experiencing feelings that they do not fit in, feelings of rejection, and they may not adjust to normal academic challenges of college life (O’Keefe, 2013). Historically, the achievement gap between minority students and nonminority students is one of the most worrying problems of colleges and universities. African American, Latino, and Native American students have substantially lower test scores, grades, high school completion rates, college attendance rates, and college graduation rates than nonminority students (Fairlie, Hoffmann, & Oreopoulos, 2014).

However, this study found that there were no statistically significant differences in ethnicities for retention for academic years 2012, 2013, and 2014. Students were retained equally

regardless of ethnicity. Although the institution has a higher enrollment of Hispanic students, they are retaining and losing the students at the same proportion regardless of ethnicity. Astin's (1993) I-E-O model indicated that inputs represented as demographics, family background, and academic history play a large role in academic success. Whereas previous research has shown statistically significant differences in ethnicity, the results of this study may be interpreted more in light of Astin's "E" dimension of the theory, as related to people, programs, policies, cultures and experiences. The university is a Hispanic Serving Institution (HSI) with 62% of the student population as Hispanics. As an HSI, the intuition could be attending to issues relevant to minorities more than other types of campuses. Thus, the results of the study as seen through Outcomes of Astin's model show characteristics of similar behavior among ethnic groups.

RQ4: How well does high school percentile/rank predict the retention of the first-time-in-college freshman? Past behavior often predicts future behaviors. Class rank is often used as a tool for retention based on the notion that if a student was successful in high school he or she has the ability to be successful in postsecondary education. Texas House Bill 588, also known as the Top 10% rule, is a Texas law passed in 1977. The law guarantees Texas students who graduate in the top 10% of their high school class receive automatic admission to all state funded universities (Texas Top 10% Act, 1997). This study looked at class rank as a predictor.

Overall, high school percentile/rank predicted whether students were retained or not. However, not all class rank categories were predictive. Astin's (1993) I-E-O model stated the personal, background, and the educational characteristics students bring with them to postsecondary education can influence educational outcomes. Astin identified characteristics to show that high school academic achievement is related to academic performance while in college. Students in the highest rank of their class are automatically accepted into a university

and it is expected they will succeed academically in college. Students in the lower high school rank are assumed to need additional help once in college and are targeted for other programming such as tutoring, supplemental instruction, and even limiting the number of hours they are allowed to take. However, students in the middle rank are not targeted for success or failure and there are no resources aimed toward that population. In addition, once a student is accepted and attending the institution there is no distinction or indication of the student's class rank past admissions. Data are collected on class rank but students are not identified accordingly once accepted and began coursework. There are no resources or services dedicated to students who are in the middle ranking of their class and these students are at risk for not returning for a second year at an institution. Institutions need to take into consideration what background students are bringing to college. Each student is different and a variety of programs is needed to meet the different needs the students may have.

RQ5: How well do SAT/ACT scores predict the retention of the first-time-in-college freshman? Attention has gravitated to identifying college readiness from assessments that measure core content area skills during high school, defining scores that signify college readiness (Maruyama, 2013). Astin (1993) suggested that the pre-college data a student brings to college establishes the inputs that predicts the end outcomes of retention.

Overall, SAT/ACT scores predicted whether students were retained or not. However, not all class rank categories were predictive. Astin's (1993) I-E-O model referred to the student's input variables as the high school characteristics that a student has prior to attending college and how it affects his or her college success. Previous research has indicated that SAT/ACT scores are used as predictors of college success and retention. Standardized test scores are used for college readiness and college placement. If a student scores above the college readiness score he

or she is reported as ready for college and has the ability to be successful. However, other factors may lead to a student's achievement on the ACT/SAT assessment. Where a student is from, whether he or she attended a school that emphasized the importance of the ACT/SAT exam, parental and family involvement on a student's education, can all have an impact on a student's ACT/SAT score. In addition, data are collected on ACT/SAT scores but students are not identified once accepted and attending. There are no resources or services dedicated to students who may not have performed well on the ACT/SAT exam. Although ACT/SAT scores are a measure of college acceptance, no resources are devoted to students whose scores tend to be lower and suggest college retention is marginalized. Standardized tests as an input may be valuable for assisting with admissions decisions, the results of the study indicate more could be done to assist with retention efforts as well.

RQ6: How well does admission status predict the retention of the first-time-in-college freshman? Freshmen applicants may obtain automatic admission to the institution by meeting the regular admission requirements. The students who meet regular admission requirements are students graduating in the top 10% of their high school and completing a college preparatory high school program. Students completing the Texas Distinguished level of Achievement Program, the International Baccalaureate Diploma Program, the Texas Recommended High School Program, the Texas Foundation High School Program with endorsement(s), or a high school program of equivalent rigor must meet criteria that is set by class rank and required ACT/SAT test scores based on class rank. Students who do not meet the regular admission requirements will automatically be reviewed using a holistic view that includes the applicant's rank in class, standardized entrance test scores, performance in specific high school courses, extracurricular activities, community service, talents and awards, leadership skills, employment,

and other factors that support a student's ability to succeed at the university. Students also accepted under the alternate admission are required to follow conditions such as: (a) required to attend a new student orientation program for new students; (b) required to meet with a professional academic advisor to complete a learning contract which will include course requirements for both fall and spring semesters; (c) register for no more than 14 semester credit hours of course work during both the fall and spring semesters earning a GPA of 2.0 or above; (d) required to enroll and pass the freshman success seminar course during both fall and spring semesters; and (3) required to meet with an assigned professional academic advisor a minimum of twice during the fall and spring semesters.

Overall, admission status predicted whether students were retained or not. However, not all class rank categories were predictive. Student retention is consistent across the three-year period based on how students were admitted to the university. However, students admitted under alternate admission have more resources and have requirements that are dedicated to them in order for them to succeed their freshman year. Astin's I-E-O model highlighted the need to understand a student's pre-college characteristics upon entry into a university and the nature of the educational environment with which a student comes into contact, to fully evaluate its effectiveness (Astin, 1993). When a student is accepted in the alternate admission program, his or her college environment is altered by the requirements set forth by the program. There is more attention directed toward these students which could affect their retention. These students receive more attention from the environment based on their input. The results indicate a need for a close interaction between the type of inputs used for admissions and the programs available for retention.

Discussion

Freshman retention continues to be an unrelenting concern of higher education institutions. There is an ongoing need to determine how institutions can utilize the data that are presented to them to determine the success of an incoming student. The findings in this study highlight the importance of analyzing the pre-college characteristics of first-time-in-college freshman. Administrators have limited data to use to gauge the success of incoming freshmen. Pre-college information is all that is available. Although this study showed that the type of data utilized is standard information, such as ACT/SAT scores, ethnicity, and admission criteria are sufficient predictors for success, they may not be enough. For example, the three-year trend showed retention rates remained the same, around 66% and the model did not predict a change to a higher rate. With pressures from state legislators implementing performance based funding according to Texas H.B. 9 and the Texas Higher Education Governing Board mandating higher graduation rates according to its higher education master plan, 60x30TX, it raised the question: Is 66% retention rate good enough? University standards aim at a retention rate above 70%. Although pre-college information is all the university administrators have in order to predict student success, the study showed the need to collect and use additional pre-college data points.

Previous research focused on theoretical models to study freshmen retention, while others have attempted to use statistical techniques to try and identify potential variables related to retention (Mertes & Hoover, 2014). The research on student retention often is centered on theoretical models and significant findings from Bean (1981), Tinto (1988) and Astin (1970). Bean's model of student attrition focused on a student's psychological factors that interact with a student's characteristics to influence how the student ultimately interacts with the institution (Bean, 1981; Mertes & Hoover, 2014). Tinto's model of student persistence stated that students

enter a university with a variety of characteristics, which include gender, race, academic achievements, and family backgrounds, that have an impact on their initial commitment to a college or university and their eventual goal of graduation (Tinto, 1988; Mertes & Hoover, 2014). Astin's theory of involvement focused on a student's success in relation to how students change and develop as a result of being involved on campus (Astin, 1999). The core concepts of his model include a student's inputs, environment, and outputs as a student enters college through graduation. Astin (1993) focused on the input variables, which could be pre-college characteristics that first-time-in-college freshmen bring with them to college to be able to understand the relationship between processes and outcomes. His I-E-O model emphasizes the importance of all aspects of student information. The "I" in the model are a student's inputs such as their demographics, background, previous experiences, and pre-college data. The "O" in the model is the student's environment which is the student experience while attending college. The "E" in the model is the student's outcomes which include student characteristics, knowledge, attitudes, principles, and beliefs a student leaves college with upon graduation.

The findings in this study are a result of analyzing student inputs. With a three-year trend and a 66% retention rate, it is up to administrators to decide what needs to be done further to improve the retention rates. University standards aim at a retention rate above 70%. While institutions cannot change the inputs and characteristics students bring into the university, they can alter and adjust the types of input data collected and the student environment. The findings show that not all levels of ACT/SAT rank, high school percentile rank, and admission status were predictive but some levels were significant. The findings can lead to defining what the at-risk factors and levels are at the institution. Administrators can begin to alter and create

programming aimed at the students who are considered to be more at risk for leaving the institution.

Since the results showed predictive values at different levels in different areas, it leads to discussions about both admission criteria and support. As mentioned above, traditional admissions criteria were used as predictors of retention. Since the predictors remained the same over a three-year time frame, it is no surprise that retention remained the same. Admission criteria may need to move beyond Astin's (1993) framework of inputs and include criteria related to Bean's (1981) concept of psychological factors as well as a measure of persistence based on Tinto's (1988) model. Institutions could collect admissions information beyond the traditional data sets to assist with retention predictions. Additionally, once students are admitted, the results of the study revealed support structures were different based on different admission criteria. This indicates support structures should be relevant to all admissions but tailored to the categories where students are placed.

Student success is at the forefront of every college and university. Attending college and earning a degree has never been more important. One student success strategy is the increased use of tools to help college administrators make accurate and quick decisions about student interventions (Davis & Burgher, 2013). Pre-college data is all that is available for college administrators to make decisions on strategies targeted to specific groups of students. If top performing high school students are successful in college, that leaves an institution with the opportunity to focus on students who historically may struggle academically. The findings in the study indicate that students who are in the middle rank are more at risk for leaving the institution. The statistical analysis gives institutions the ability to direct student success measures such as mentoring, tutoring, and academic coaching based on student probabilities of success (Davis &

Burgher, 2013). The institution currently has a first-year experience program that includes a first-year seminar course, mentoring, and advising. All first-time-in-college freshman are required to take a first-year seminar course for two semesters, attend weekly peer mentoring sessions, and visit with their academic advisor for registration. Students are assigned to their first-year seminar course, mentor, and advisor based on major. No other variables are used in the design of the first-year experience programming. The findings in the study indicate that the students who are in the middle rank of high school percentile and ACT/SAT and admitted under alternate admissions are more at risk for leaving the institution. Utilizing this data will enable the institution to use its current programming to redesign and refocus on those students who are statistically more at risk. In addition, the study showed the need to collect and use additional pre-college data points that will also further help the institution to design an effective student retention program.

Designing an effective student retention program is of critical importance from a completion and monetary standpoint (Mertes & Jankoviak, 2016). Retention planning should include all stakeholders, programs, and offices across a university (Kiser & Hammer, 2015). In addition, expectations should be brought to the forefront and the university should focus on the student experiences that most directly influence student success (Kiser & Hammer, 2015). Knowing the statistical analysis of the student characteristics would help institutions design effective programs that are tailored to the students that are accepted and enrolling at their institution. Resources can be shifted to focus on students who have the highest probability of struggling academically. The economic benefit of shifting focus can greatly impact the future of the student and the institution. Even though institutions are working to increase retention, in order to be success more work will need to be completed (Kiser & Hammer, 2015).

The study confirmed one major aspect of using standard pre-college factors to predict retention. Using standard data sets for the current institution does not change an increase in predicted outcomes. Raising college entrance criteria, such as ACT/SAT and/or more top high school graduates may increase retention rates at the same time reduce the number of students the institution serves. There may be higher retention rates but lower participation rates. If the institutional officials want to increase both retention rates and admissions rates, utilizing standard data sets for decision making only points to the problem but does not solve it. Other data sets are going to be needed.

Implications

The results of the study have implications that affect different departments at the university level. They include admissions and recruitment, student success, mentoring, tutoring, and advising. Perhaps one of the more obvious implications of the study is that the data gathered on the incoming students may not be enough to predict student success and additional data are needed. Astin's (1993) I-E-O model indicated that a student's outcome is a function of his or her inputs. A student is deemed college ready by passing the minimum requirements set forth by the state and are eligible for college admission if he or she has: (a) graduated from high school; (b) completed courses that universities require for the attainment of academic skills; and (c) demonstrated basic literacy skills (Horton, 2015). While most institutions gather data that can be collected from transcripts, which include standardized test scores, high school grade point average, and rank in class, a student's background also includes his or her parent's schooling, economic status, involvement in high school, home environment, learning style, and even social behavior. A student's work ethic, values, and morals are a function of this or her background

characteristics. Learning about the entire foundation of a student will help universities better serve all incoming freshman.

Vincent Tinto's Theory of Student Departure (1988) identifies three major foundations of a student departure: (a) academic difficulties; (b) the inability of individuals to resolve their educational goals; and (c) their failure to become or remain incorporated in the academic and social life of the institution. Tinto's theory focuses on the environment aspects of the higher educational institution that affects student success. The theory tends to be framed from a deficit perspective to where students lack certain skills and abilities to succeed. The implication from the study indicates a deficit model to where students must meet particular standards in order to persist, such as needing alternative admissions, high school class rank, and ACT/SAT scores. However, students may not always have opportunities in high school to be able to meet standard college requirements. Retention at the institution may need to be examined from an asset standpoint, that is, what do students already possess to where they will be successful. The university can build an admissions and support structure around those points, such as cultural beliefs, ties to the community and region, family structure, and small cohorts with common interests.

In this study, there were no statistically significant differences in the retention of students based on their incoming age. The majority of first-time-in-college students enter a university immediately after graduating high school at the age of 18. However, some students choose to delay the start of college for a variety of reasons which include, work, family, time-off and others. Even though the number of 18 year old students entering college is generally more than 19 years old, no matter the age the retention rate remained the same. As a regional institution, the university draws students from similar backgrounds. Although age may show statistically

significant difference in other studies, the type of institution and where its students reside before college becomes an important issue. With regard to Astin's (1993) input model, one's sense of community may be a valuable indicator for retention.

Nevertheless, the reasons for a student not returning to college subsequent years may be different for students above the traditional matriculation age of 18. According to Cochran et al. (2014), older students have more responsibilities outside of school such as work and family, and as a result have circumstances that hinder their flexibility as a student. Thus, admission criteria may be sufficient for retention but not persistence, where persistence is the continued progress to completion. This is a difficult measure of pre-college indicators. As students' progress through their college careers, their situations change. They may get jobs or change jobs, get married, expand their families, face health issues, or have to address any number of life circumstances that shape their trajectory. No pre-college data sets can account for those. Thus, the environment becomes more important for both retention and persistence.

The next implication takes into consideration current advising practices. Current advising practices do not take the age of an incoming student into consideration while developing a schedule for the first-time-in-college freshmen. Advising currently looks at the college readiness of a student and if any college course work has been previously taken. A student's age and whether he or she has any outside responsibilities is not taken into consideration when devising a schedule. Generally, an advisor does not learn of other factors to consider until the first advising appointment. A student's first time meeting an advisor is at freshman orientation where advisors are in the process of meeting all 250 incoming freshmen at that specific orientation date. At this stage, all freshmen are treated the same even though the data show there are differences in their

pre-college status. It may be that the university has limited resources. Whatever the issue, current advising strategies do not account for differences in new student status.

There were no statistically significant differences in the retention of males and females. The implication is that the freshman experience appeals to both males and females similarly. Whether it is the influence of advising, the courses they take, their background in the community, or a combination of issues is uncertain. The results, though, suggest a common experience to where retention remains static with regard to gender, most likely due to environmental influences (Astin, 1993). The environment is identified because retention remains low and has not changed in three years. Regardless of whether students are male or female, environmental conditions are such that they are not being retained at higher rates.

There were no statistically significant differences in the retention of the first-time-in-college freshmen based on ethnicity. The institution is a Hispanic Serving Institution that serves a higher risk population of students, the similarities they have as high-risk students appear to outweigh the ethnic differences they have as a heritage. O'Keefe (2013) wrote that higher risk students need a connection to other students in similar situations with whom to identify. Connections, even if it with one key person, can make a difference toward retention. The single most important factor is to make sure high-risk students feel cared for. If this occurs, a feeling of a sense of belonging emerges. It appears that the campus environment, by design or happenstance, promotes student engagement to where ethnicity is not a critical factor.

Standardized tests, such as ACT/SAT are frequently used for admission criteria to attract top students to an institution. The current institution, however, uses it as admission criteria but only to identify a ranking order. The results show it can be used for more than that. Since different levels of ACT/SAT rankings showed different predictive values for retention, the

implication pertains to initial advising. Advisors could use the information to tailor course schedules to fit student profiles better. This may be difficult as core requirements should be met with students' first two years in college. Nevertheless, there are a number of different courses within subject matters to where advisors could tailor course scheduling.

The study found that students admitted in the alternate admission program were more likely to be retained than those admitted under other criteria. Students admitted under the alternate admission program are provided with a specific set of guidelines to follow in order to attend the institution. These guidelines provide advice for the students to register for a specific amount of hours and to meet with their advisor two times during the semester. This implies that students are getting more input about their college career than other students. They are given a specific roadmap about how to navigate the system. As first-time-in-college students, they often do not have the advantage of parents or relatives who can help them navigate the complexities of college life. Unfortunately, the guidelines for an alternate admit is only in effect for student's first semester and there are no procedures if a student is not successful after the first semester.

Another implication of the findings may affect current advising practices and mentoring program. Other than college readiness and previous college course work, no other factors are considered in advising first-time-in-college freshman. The institution currently has a centralized/decentralized professional advising model. The advisors are centralized in the sense that they all report to the same department of Student Success. The advisors are decentralized in the manner that they are all housed in offices located in the college department that they advise. Advisors are currently assigned to students based on majors and there is one advisor who specializes in at-risk students. These students are not assigned to the at-risk advisor until they are on enforced withdrawal. Students are placed on enforced withdrawal when they experience two

consecutive semesters with a GPA below 2.0. Advisors do currently have an academic recovery plan with specific requirements, however, that plan is used on students who are on academic probation only. With the results of the study programs such as advising, mentoring, and tutoring can be developed to serve targeted student populations. Advisors could be cross trained to manage students who are deemed at-risk.

Students who are admitted under the alternate admission program have a specific set of requirements they should follow. Unfortunately, there are no consequences or follow through set in place to indicate whether the requirements were met. The alternate admission program is solely used for admission requirements and at-risk factors are not necessarily considered. The study found that students where who were in the mid-rank of high school percentile and ACT/SAT rank were more at risk for leaving the institution. These students may or may not be in the alternate admission program and therefore may not have any requirements during their first semester of college. At this time, the institution has not designated specific early alert indicators of students entering the institution. The Center for Student Success and the First-Year experience program was developed in 2011 to aid in freshmen retention. However, the further creation of programs and specific at-risk conditions have not been specified at the institution. While the data are gathered, they are not utilized to further aid in the retention of the first-time-in-college freshmen.

Recommendations for Future Research

The study raises a number of issues for future research. Although there are some differences among pre-college characteristics and the model is predictive, as a whole, it opens areas for further examination. First, it is recommended that the study be replicated to include a larger set of more recent student data, particularly because Texas Success Initiative scores and

STAAR scores were not included in this study due to not enough samples. The study used pre-college variables available from the institutional reporting office; a future study could include other data that are known prior to a student registering and attending the first day of class. This could further the student profile to include student major, number of hours enrolled, dual enrollment coursework and athletic status to see if these variables have an impact on student retention.

Second, students' backgrounds need to be reevaluated. The study showed no differences in gender and ethnicity, whereas past research indicated there are differences and they are crucial variables (Bean & Metzner, 1985; Cochran et al., 2014; & Purdie & Rosser, 2011). Included in future research should be a measure for assessing students' community connectedness aside from traditional variables, including socio-economic background. Community connectedness refers to a person's connectedness to others, as well as their interdependence because of their similarities. As such, an individual's thoughts, emotions, and behaviors can be influenced by an array of entities, such as other individuals, governments, societies, and cultures (Jason, Stevens, & Ram, 2015). Thus, community may have a strong influence and be a predictor of retention more than traditional factors of the past. If colleges and universities draw students largely from a close proximity to the institution, traditional admission models may not be sufficient for retention decisions.

Third, the study showed the alternative admission process as more predictive of retention than other admission processes. Since the institution provides more resources to those students, future research should examine how the types of resources institutions use for students to navigate their education relate to retention. Campus personnel cannot expect students to be entirely comfortable in a new environment. This could be akin to culture shock. Even though the

majority of students do not come from foreign countries, culture shock may be experienced. The level of culture shock can prolong or minimize a person's adaptation to the new environment. Culture shock is simply the process of adjusting to an unfamiliar environment (Presbitero, 2016). It appears that the alternative admissions process provides more materials than other admission processes to help with the adjustment period. Future studies can examine admission processes from a culture shock perspective.

Fourth, the study showed the need to collect additional data points. The data collected does not have to be tied to admission decisions but should be collected to help predict retention. A survey should be developed to collect data not included on transcripts and applications. The survey should include questions for students that stayed at the institution, as well as students who were not retained. Questions for students that continued at the institution should include: (a) Why did you chose to stay at the university; (b) How has your college experience met your expectations; (c) Did you feel prepared for university life; (d) What factors led your decision to continue at the institution; and (e) How satisfied are you at this institution? In addition, the questions for students that did not continue at the institution should include: (a) Why did you chose to leave the university; (b) Did you feel prepared for university life; (c) Were your expectations of university life met; (d) Did you feel academically prepared for university life; and (e) How satisfied were you at the institution? Collecting information from students who stayed and left the university will give the institution a better picture of student satisfaction. The data collected could help the institution make strategic decisions on programming and student success.

Finally, it is recommended that current advising practices be adjusted to target interventions on students who are considered more at risk upon entering the institution. Effective

intervention can play a role in student retention when involvement begins at the first sign of academic difficulty (Tampke, 2013). The alternate admission process provides resources to a student in their first semester only. A student is required to visit with their academic advisor during the semester and further interventions can be in place during those meetings. In addition, academic advising plays a powerful role in a student's educational career. During advising sessions, advisors are able to build a relationship with their students and direct them to stay on track to graduate. Advising demonstrates the powerful effect out-of-class interactions can aid in student retention (Drake, 2011). Future studies can examine advising practices from a mentoring relationship perspective.

Retention Model

The goal of the study was to find which pre-college variables could predict the retention of the first-time-in-college freshman. Specifically, this study examined the demographics (age, gender, and ethnicity) and pre-college variables (high school rank, ACT/SAT rank, and admission status) of the first-time-in-college freshman. Retention is at the forefront of administrators, coordinating boards, institutions, and university systems. Retention is what drives university budgets and state allocations to institutions. If budget cuts are coming it is probably because not enough students are retained. Institutions are spending money on first year experience support services and retention has remained low for the past 30 years. Retention has not changed even with retention programs. Maybe institutions need to look at predictors before students step foot on campus. The Pre-College Factors Model in Figure 2 shows how Astin's I-E-O Model (1993) integrates with pre-college factors and how it leads to student retention. The first part of the model looks at prior indicators as predictors of retention.

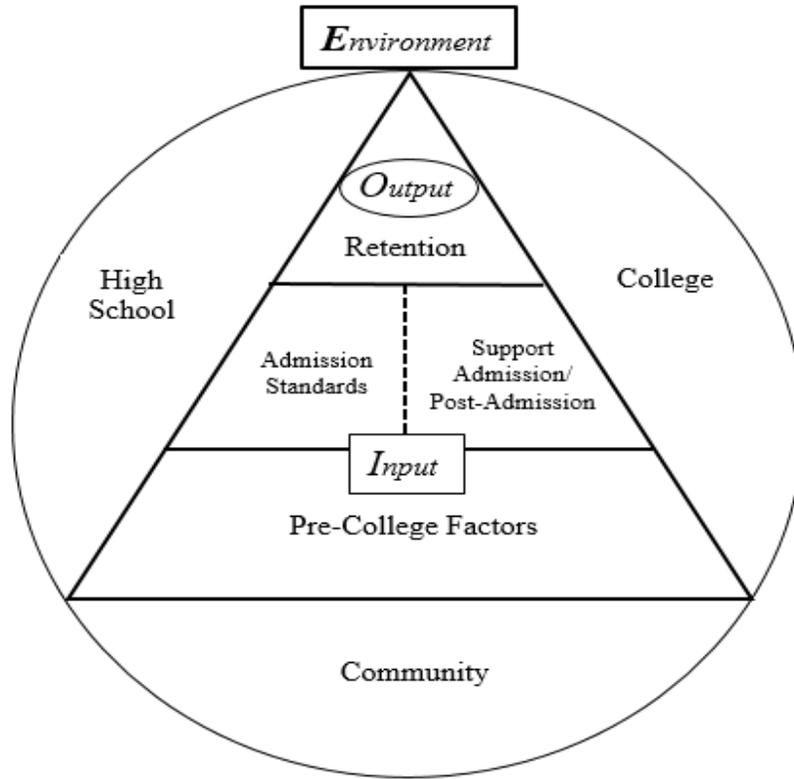


Figure 2. Pre-College Factors Model.

Astin's (1993) I-E-O perspective on retention is grounded in the Environment in this study. The environment does not just consist of a student's high school background and college standards. There were no statistical differences in gender and ethnicity, suggesting the community experiences are similar to affect college success, even though previous literature states these are major factors for differences in retention. Regional institutions, such as the one in the study, should include more community indicators when predicting the Output of retention. Retention will not be enough to satisfy budget and policy demands, it must lead to higher completion rates, yet it has to begin with retention. Key Inputs in the model cannot be limited to tradition admission standards, such as high school GPA and ACT/SAT scores. Additionally, admission standards should include Inputs supporting structures revolving around the admission's process, as well as post-admissions' needs tailored to the types of diverse students

applying. Views of diversity are not to be limited to gender, age, ethnicity, SES but could include personal interests, family structure, type of admission process, and/or initial interest in a major. Students making stronger connections among themselves and with people in an institution should help retention.

Overall, the model depicts prior indicators as predictors of retention. The data collected does not have to be tied to admission decisions but should be collected to help predict retention. The model entails the admission process and standards. When looking at admissions there needs to be a strong support structure for each of the ranking groups that are considered for admission into the university. A university cannot assume the top ranking students will always be successful and the low ranking students will not always be successful. Furthermore, the model looks at the student's full environment. A student's success is not only based from their high school achievements but also their community which includes family, friends, and extracurricular activities. In addition, a student's environment entails how the student fits within the institution and whether the university they chose is a good fit. The model also includes the student's retention to the following year. The model illustrates how the entire aspect of a student is integrated and affects retention and student success.

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