The Effects of Pre-Collegiate Academic Outreach Programs on First Year Financial Aid Attainment, Academic Achievement and Persistence

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THE EFFECTS OF PRE-COLLEGIATE ACADEMIC OUTREACH PROGRAMS ON FIRST-YEAR FINANCIAL AID ATTAINMENT, ACADEMIC ACHIEVEMENT AND PERSISTENCE

By

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I dedicate this dissertation to all the “Diamonds in the Rough” who defy the odds every day. At first glance, naturally occurring diamonds are quite ordinary and their true beauty as precious jewels is only realized through the polishing process.
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ABSTRACT

National statistics continue to show substantial disparities in the postsecondary enrollment and completion rates between more and less advantaged groups. Despite gains made on the part of low-income, first generation, and minority students in the areas of access, persistence, and academic achievement, gaps still exist (Avery & Kane, 2004; Gladieux & Swail, 1998; NCES, 2002; 2006). Pre-collegiate outreach programs have demonstrated success and studies suggest that college qualified low-income students who receive college preparatory guidance are more likely to attend college than those who do not (King, 1996). However, a review of published reports of these programs suggests mixed and some negative results with very few programs having been subjected to rigorous evaluations.

The purpose of this study was to examine the effects of pre-collegiate programs on financial aid attainment, first-year persistence, and college GPA. Comparisons were made among two groups of first-time in college, low-income students enrolled in a first-year transition Summer Bridge Program at a four-year public institution in the academic years of 2003 – 2006. The treatment group consisted of college freshman enrolled in the University’s first-year transition Summer Bridge Program who also participated in a pre-collegiate academic outreach program (i.e., Upward Bound, Talent Search, GEAR-UP, etc.) in high school. The control group consisted of college freshman with similar background characteristics enrolled in the first-year transition Summer Bridge Program who never participated in a pre-collegiate academic outreach program in high school.

Data used in this study are records of 1,197 students who entered the institution from Summer 2003 through Summer 2006 and enrolled full-time. Using descriptive statistics, logistic regression, and multiple regression the researcher examined whether students who participated in a pre-college academic outreach program persisted differently their freshman to sophomore year of college than non-program participants with similar student background characteristics. The study also explored differences in first-year cumulative college GPA and gift financial aid award amounts to explore if program participants were more likely to have higher grade point averages and obtain higher gift financial aid awards than non-program participants.

When examining the total number of 1,197 students in the sample, the researcher found that 217 students (18.1%) did participate in a pre-collegiate outreach program in high school and
of the students did not participate in a pre-collegiate academic program in high school. The majority of students in the sample were students of color (N=1,008).

The average gift financial aid award for the total sample was $3,810 with the average award for pre-collegiate program participants being $3,926 and $3,743 for non-program participants. The average first-year college GPA for the entire sample was 2.67. The average first-year cumulative college GPA was 2.51 for pre-collegiate program participants and 2.71 for non-participants. In terms of persistence, 1,077 (90.0%) students from the total sample (N=1,197) persisted to their sophomore year. This figure consists of 189 (87.1%) of all pre-collegiate program participants (N=217) persisting and 888 (90.6%) of all non-program participants persisting (N=980).

Multiple regression was used to analyze the impact of pre-collegiate program participation on gift financial aid attainment and academic achievement. Binomial logistic regression analysis was conducted to address the research questions related to persistence. After controlling for student background characteristics, the main findings were: (1) participation in a pre-college program had no significant effect on the likelihood of receiving more gift financial aid for the first year of college when compared to non-participants; (2) participants in pre-college programs had lower probability of obtaining first-year cumulative college GPAs of 3.0 of higher than non-participants from similar backgrounds; and (3) participants in pre-college programs had lower probability of persisting to their second year of college than non-participants from similar backgrounds.
CHAPTER ONE

INTRODUCTION

Higher education has a profound impact on both individuals and society. Education is one of the surest ways for individuals to improve their social and economic status and overcome the barriers of poverty and destitute social conditions (Swail, 2000). The rising cost of education; rising admissions criteria; lack of knowledge about the college admissions and complex financial aid processes; and inadequate academic and socio-cultural preparation have all been cited as barriers to access and success (De La Rosa & Tierney, 2006; Heller, 1997; Mortensen, 2002; St. John, 2003; Swail, Redd, & Perna, 2003). This disconnect is most evident in students from low-income backgrounds who are the least likely to know what is required in terms of academic grades, college entrance exams, core competencies, and financial aid (Zeidner, 2006). Often, those who face the greatest barriers to pursuing a college education are young adults from low-income families and families in which neither parent completed college; many of these students are members of racial and ethnic minorities (U.S. Department of Education, 2001). Today, the discussion in public policy has moved from access to issues of choice, affordability, and persistence (Swail, 2003).

Since the Civil Rights Era and the Higher Education Act of 1965, the American higher education system has been very successful at increasing educational access for minority and low-income students. For example, total undergraduate enrollment in degree-granting postsecondary institutions has generally increased over the past three and a half decades (National Center for Education Statistics [NCES], 2006). This success may be attributed to a number of factors including federal, state, and institutional policy changes and improvements in the areas of the allocation of direct student aid, enrollment management, academic preparation, and retention programs. Despite gains made on the part of low-income, first generation, and minority students in the areas of access, persistence, and academic achievement, gaps still exist (Avery & Kane, 2004; Gladieux & Swail, 1998; Horn, Nevill, & Griffith, 2006; NCES, 2002;). For instance, although the percentage who completed a bachelor’s degree or higher increased for White, Black, and Hispanic 25- to 29-year-olds, the gaps between Whites and Blacks and between
Whites and Hispanics have widened over time (NCES, 2006). In addition, only 22% of low-income students who enroll in college eventually receive their Bachelors degree, compared with 78% of high-income students (Perna & Swail, 2001). Low-income students are more likely to delay college enrollment after high school resulting in a lower likelihood of degree completion (Bozick & DeLuca, 2005). The odds of degree attainment are even lower for first generation college students (Somers, 2000) who are disadvantaged in parental assistance, receiving less help during the application process than those whose parents are college educated (Choy, 2001).

**A Brief History**

With the inception of the War on Poverty in the 1960s, many federal, state, community and privately-funded initiatives were undertaken to alleviate some of the barriers to attending college and completing a degree faced by low-income, first-generation college students and minority students (Adelman 1999; James, Jurich, & Estes 2001; Swail & Perna, 2000). Because of the difference in enrollment rates, students whose parents did not go to college are one of the most frequently targeted groups (along with minorities and low-income students) for outreach programs designed to raise the level of student preparation and readiness for postsecondary work (Swail & Perna, 2000).

The past several decades have seen an increase in college outreach programs (Domina, 2009). Outreach programs have ranged from the Equity 2000, Advancement Via Individual Determination (AVID) and Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR UP), which are integrated with the regular high school or middle school experiences, to programs that more often supplement the high school experience, such as Upward Bound, Talent Search and I Have a Dream. Whether funded by the federal government, institutions of higher education, or private philanthropies, these educational programs are designed to ease the path to higher education for students who have traditionally been underrepresented in higher education, including low-income students, minority students, and first-generation students. More than 1,000 college outreach programs operate in the United States today (Domina, 2009), each offering a unique mix of educational support and information to diverse sets of student populations (Gandara & Bial, 2001; Perna, 2002).

The National Survey of Outreach Programs (1999) concluded that these pre-collegiate academic development programs are significant in helping disadvantaged students achieve the
same scholastic achievement as their more privileged counterparts. However, despite all the planning and funding that goes into producing college outreach programs, we know relatively little about how well these programs work. A review of published reports of these programs suggests that few have been subject to rigorous evaluation and the effectiveness of the approaches seen in many outreach programs is generally unknown (Myers, Olsen, Seftor, Young, & Tuttle, 2004).

**PURPOSE OF THE STUDY**

The purpose of this study was to evaluate the effects of pre-collegiate academic outreach programs on the financial aid attainment of low-income college students enrolled in a first-year transition Summer Bridge Program who were participants in pre-collegiate academic outreach programs that include, Upward Bound, Talent Search, GEAR-UP, College Summit, and/or the College Reach-Out Program. This study examined the potential effects of participation in the aforementioned pre-collegiate programs on first-year persistence, and academic performance as measured by first-year college grade point average. In this study, the researcher examined whether students who participated in one of the pre-college academic outreach programs above persist differently from their freshman to sophomore year of college than non-program participants with similar student background characteristics. The researcher also examined if program participants are more likely to obtain financial aid than non-program participants for postsecondary education. Further, in order to examine the potential effects of pre-collegiate programs on financial aid attainment, first-year persistence, and GPA, comparisons were made among two groups of students who were enrolled as college freshman in the academic years of 2003 – 2006.

The treatment group consisted of college freshman enrolled in the University’s first-year transition Summer Bridge Program who also participated in a pre-collegiate academic outreach program (i.e., Upward Bound, Talent Search, GEAR-UP, etc.) in high school. The control group consisted of college freshman with similar background characteristics enrolled in the University’s first-year transition Summer Bridge Program who never participated in a pre-collegiate academic outreach program in high school. The focus of this study was on pre-
collegiate academic outreach programs and the Summer Bridge Program was only used as a sampling frame to have low-income students be examined.

Students eligible for admission to SBP have financial need as determined by the Office of Financial Aid and do not meet one or more of the university’s traditional admissions requirements. These may include, high school courses completed, ACT and SAT scores, and high school class rank. In addition, each SBP-admitted student must:

1. be a legal resident of the state where the University is located
2. be a first-time college student, with fewer than 12 earned credits while enrolled in either, a two or four-year higher education institution. (Dual enrollment credits do not apply)
3. have a minimum cumulative weighted grade point average of 2.50 as calculated by the university’s Office of Admissions;
4. have a minimum SAT score (Critical Reading and Mathematics sections) of 910; or a composite score of 19 on the ACT.

Student eligibility and the application process for admission to a pre-collegiate academic outreach program in high school varies according to the program. The researcher was only aware of the specific eligibility guidelines for participants of federal TRiO Programs that included the Upward Bound Program and the Talent Search Program. Students enrolled in either of these programs must meet all of the following requirements:

1. Is a citizen or national of the United States.
2. Is a permanent resident of the United States.
3. Is in the United States for other than a temporary purpose and provides evidence from the Immigration and Naturalization Service of his or her intent to become a permanent resident.
4. Is a potential first-generation college student; a low-income individual; or an individual who has a high risk for academic failure.
5. Has a need for academic support, as determined by the grantee, in order to pursue successfully a program of education beyond high school.
6. At the time of initial selection, has completed the eighth grade and is at least 13 years old but not older than 19.
RESEARCH QUESTIONS

The primary purpose of this study was to examine the linkage between pre-collegiate academic outreach programs, financial aid, academic performance, and first-year persistence. The general research question addressed by this study was: Does participation in a pre-collegiate academic outreach program have any effect on first-year financial aid attainment, academic performance, and persistence for low-income first-time, freshman college students?

More specifically the following questions were asked:

1. Are pre-collegiate participants awarded significantly larger gift financial aid packages than non-program participants?
2. Do pre-collegiate participants obtain significantly higher first-year GPA’s than non-program participants?
3. Do pre-collegiate participants persist at a significantly higher rate than non-program participants?

SIGNIFICANCE OF THE STUDY

In the National Survey of Outreach Programs (2000), one-third of all respondents were TRIO programs (Upward Bound and Talent Search). Upward Bound is the first of a group of federally funded programs collectively known as TRIO and prepares high school students for higher education through a subject-matter focused academic program. Talent Search focuses on information and college awareness for students in grades 6-12. The other major federal initiative, GEAR UP, accounted for nine percent of the respondents.

These types of programs have demonstrated success and studies suggest that college qualified low-income students who receive college preparatory guidance are more likely to attend college than those who do not (King, 1996). In addition, researchers generally look to these programs to identify a set of “best practices” for early outreach programs. Nevertheless, while most outreach programs produce some data regarding their impact on participants, there are few rigorous evaluations of outreach programs. Researchers agree that most current outreach program evaluation data are unreliable and provide little information about the actual impact of the program on students on persistence in higher education (Gandara & Bial, 2001). Since most higher education administrators do not collect longitudinal data on the effects of these types of
programs on student outcomes at their institutions, this study provided a unique perspective. In addition, few programs maintain such a large student database or use a control group to compare outcomes for program participants.

**Limited Understanding of the Effects of Pre-Collegiate Outreach Programs**

A key element of most pre-collegiate academic outreach programs involves a financial aid component. Generally, the programs provide either students and parents with information about how to apply for financial aid or they provide financial aid as an incentive for students to go to college. Most pre-collegiate outreach programs stress academic and social preparation for college (Perna, 2002; Tierney, Corwin, & Colyar, 2005). Although these key elements have been affirmed through research, very little is known about the actual impact of college preparation programs on increasing college enrollment and persistence (Gándara & Moreno, 2002; Tierney, Corwin, Auerbach, & Venegas, 2003). Of the research that has been done on pre-collegiate programs, there has been little mention of increasing access to financial aid or increasing awareness of aid availability, even though research has shown that financial aid is crucial for low-income students and minority students (Flint, 1993; Levine & Nidiffer, 1996; Tierney, 2004).

There have been very few large-scale evaluations of pre-collegiate outreach programs. Six major reports are currently available that discuss the field of college access and academic enrichment programs. In summary, these reports indicate that program evaluation data in general are unreliable and therefore, fail to provide useful information about the impact of the programs (Bailis, et.al, 1995; Gandara, 2001; Hayward et. al., 1997; James, Jurich, & Estes 2001; Osterreich, 2000; Swail and Perna, 2001). Most of the research studies and evaluations on pre-collegiate outreach programs have focused on two major federally funded programs, TRIO (Upward Bound and Talent Search) and GEAR-UP. One of the first research evaluations of pre-collegiate outreach programs conducted by Burkheimer, Riccobono, and Wisenbaker (1979), led a team of Research Triangle Institute (RTI) researchers in a comprehensive longitudinal evaluation of Upward Bound programs from 1973 to 1978. The results of the evaluation found that the Upward Bound Program had an impact on educational aspirations, postsecondary education progress, and persistence. The researchers found that the impact appeared to be related to “the participation patterns of former participants; those with typical participation patterns
generally exhibited more positive outcomes than those with atypical patterns” (p.133). The researchers concluded that the Upward Bound Program was effectively meeting its mandated objective to provide participants with the skills and motivation necessary for entry and success in education beyond high school.

However, over 18 years later, there were two retrospective analyses of the RTI studies. An independent group that analyzes public policy, Mathematica Policy Research, Inc. (1997a, 1997b, 2009) came to controversial and mixed conclusions about Upward Bound's effectiveness. The Mathematica study was the first large-scale evaluation of Upward Bound since the late 1970s. Researchers randomly selected 67 Upward Bound sites and compared Upward Bound students to a control group with similar socioeconomic circumstances who did not have access to the program. In the study, they examined educational outcomes such as whether a student graduated from high school, applied to college, was admitted, and enrolled.

The study found that Upward Bound "had no impact on students' in-school behavior, participation in extracurricular activities, grade-point average, or credits earned in subjects such as English or science. Furthermore, Upward Bound was rarely successful in achieving one of its stated goals as it had no impact on high-school graduation (Myers, Olsen, Seftor, Young, & Tuttle, 2004, p. 8)" and "no impact on the chances students attended college (Myers, et. al, 2004, p.8)." The study also found that most students participated in the program for an average of only 19 months, often sporadically. The most controversial finding of the study noted that Upward Bound had positive effects on its participants' overall educational attainment but no effect on their persistence in college.

**Limited Rigorous Evaluations**

During the 1970s and 1980s, there was a decrease in the achievement gap (National Center for Education Statistics, 2001). Ward (2006) stated that this finding may be attributable to the proliferation of federally funded programs, such as TRiO, that were designed to address the problem of equity and access to quality education for low-income, first-generation, and minority students. Using data from the National Educational Longitudinal Study (NELS), Horn and Chen (1998) demonstrated that participating in any type of outreach program during high school nearly doubled the odds of “at-risk” 1992 high school graduates enrolling in a four-year
college or university. Other evaluations generally showed that college enrollment rates are higher for program participants than for non-participants.

In their national study of early intervention programs, Gandara and Bial (2001) found only 13 studies that were empirically rigorous enough to be used in their analysis of best practices. What researchers have found is that committed mentors and peer groups, cultural sensitivity, and scholarship and financial support are among the attributes that work in pre-collegiate programs (Gandara & Bial, 2001; Levine & Nidiffer, 1996; Perna & Swail, 1998).

In 1999, the College Board, in association with The Education Resources Institute (TERI) and the Council for Opportunity in Education (COE) designed and administered the National Survey of Outreach Programs. The survey was designed to provide detailed information about all types of early intervention programs. The survey found that although nearly 94% of programs responding reported that they conduct program evaluations, these evaluations were found to be very weak and were frequently no more than a tally of the numbers of students participating in particular activities. The major problem for most programs is that there are limited funds to hire external evaluators and most have little or no expertise to conduct their own data collection and analysis (Tierney & Hagedorn, 2002).

Access and completion rates for African American, Hispanic, and Native American students have always lagged behind those for White and Asian students. The gaps are significant, with African-Americans between the ages of 25 and 29 attaining bachelor’s degrees at nearly one half—and Latinos at one-third—the rate of Whites (NCES, 2006). The same is true for low-income students and students with disabilities (Gladieux & Swail, 1998). Today, fewer than nine percent of these students earn a bachelor’s degree by age 24 (Mortenson, 2005). In sharp contrast, 75% of students from the top income quartile receive such degrees by age 24. These figures mean that the gaps today are wider than they were 30 years ago.

In today’s climate, governmental granting agencies have higher expectations and levels of accountability. As a result of constricted budgets, pre-collegiate academic outreach programs have come under increased scrutiny and will be required to link program effectiveness and costs (Swail, 2006). While policymakers understand that many of the early intervention programs such as GEAR-UP, Upward Bound and Talent Search provide a valuable service to program participants, the empirical research is limited about what program strategies work best and for whom (Gandara, Larson, Mehan, H., & Rumberger, 1998; Perna & Swail, 1998).
OPERATIONAL DEFINITIONS

Throughout the existing literature on college students and degree attainment there are a number of terms that pertain to the foundations of this research which require operational definitions. In order to empirically measure each variable in the data analysis and to provide clarity in the study, the following variables have been operationalized.

**First-Generation:** A student from a family in which neither parents holds a bachelor’s degree.

**Low-Income:** An individual whose family taxable income did not exceed 150% of the poverty level amount in the calendar year preceding the year in which the individual initially enrolled in the university. The poverty level amount is determined by using criteria of poverty established by the Bureau of the Census of the U.S. Department of Commerce. Low-income students who complete a Federal Application for Federal Student Aid (FAFSA) are determined to have financial need.

**TRIO Programs:** The Federal TRiO Programs consist of a group of seven educational opportunity programs funded through the United States Department of Education. These programs are designed to motivate and support students from disadvantaged backgrounds by providing academic and socio-cultural experiences at the middle school, high school, and postsecondary educational levels.

**Pre-Collegiate Academic Outreach Programs:** Programs operated by universities and colleges, federal or state agencies, or non-profit organizations that target primarily individual students rather than classrooms or whole schools. The college access and enrichment programs as described in this study provide supplemental academic assistance and/or enrichment activities to primarily middle and high school students. These programs are student-centered academic social and economic program activities that help prepare students for college and for the purposes of this study will include the Upward Bound Program, Talent Search, Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR-UP), College Summit, and the College Reach-Out Program (C.R.O.P.)

**Summer Bridge Program:** An alternative admission program for disadvantaged college students. This high school to college bridge program is designed to help ease students’ adjustment to college life and build a foundation for academic success. Students are required to
apply for federal financial aid, and those students who are Pell eligible have 100% of their need for the summer program met from non-loan sources

**Gift Financial Aid:** Total financial assistance awarded in the form of grants and scholarships that do not require repayment. In this study, only gift financial aid awarded during the freshman Fall semester will be measured.

**Academic Achievement:** In this study, academic achievement will be measured using the cumulative first-year college grade point average (GPA).

**First-Year Persistence:** In this study, first-year persistence is defined as continued matriculation of each entering freshman cohort from their freshman Fall semester to their sophomore Fall semester. The term first-year persistence is used interchangeably with the term retention. In this study, institutional persistence rather than system persistence will be examined.

**SUMMARY**

Policy makers at the federal, state, and institutional level continue to focus on retention and graduation rates. The educational literature shows that more remains to be learned about how institutions contribute to college student persistence. Examining the outcomes of structured and successful college preparation and retention programs may help us to better understand how to positively affect student persistence, particularly for low-income students. It is vital that policymakers, the public and educational leaders have a full understanding of the role of institutional investment in higher education and to recognize its influence on obtaining positive student outcomes for all students. It is the hope of the researcher that this study may generate useful information related to the development of access, intervention, and retention strategies for college students from economically and educationally disadvantaged backgrounds.

In sum, the results from the research may: (1) Inform institutions about what they can do to promote student retention; (2) Provide useful information to middle and high school college preparation programs dedicated to working with low-income and disadvantaged students; and (3) Help create an understanding of how pre-collegiate programs increase students’ academic preparation, college enrollment, and degree attainment.
CHAPTER TWO

LITERATURE REVIEW

This chapter presents a review of the literature relevant to first-generation, low-income students and the impact of pre-collegiate academic outreach programs on student financial aid, academic performance, and persistence of low-income, first-generation college students. This chapter also provides the conceptual framework for the study.

The first section contains information regarding the theoretical perspectives on student persistence followed by a review of the relationships between variables and student persistence. Emphasis in this section is placed on three persistence models: Tinto’s Model of Student Integration (1975; 1993), Bean’s Student Attrition Model (1980, 1982, 1983, 1985; Metzner & Bean, 1987), and Astin’s Theory of Student Involvement (1984). The next section contains a review of relevant literature on first-generation and low-income students. The third section will discuss financial aid trends in higher education and the theoretical studies of the effect of financial aid on persistence. Finally, this chapter will examine literature on academic performance and academic preparation.

The procedure used to identify pertinent literature was based on computer assisted searches of various educational databases. These sources included ERIC and PsycINFO. Within ERIC, the Current Index to Journals in Education (CIJE) and Resources in Education (RIE) were searched. To date approximately 100 primary and secondary sources relevant to this study were identified and reviewed.

THEORETICAL PERSPECTIVES ON COLLEGE PERSISTENCE

Landmark studies by Astin (1975, 1977), Bean (1980, 1985), Cope and Hannah (1975), Cabrera, Nora, and Castaneda (1993), Metzner & Bean, (1987), Tierney (1992), and Tinto (1975, 1993) have shaped how researchers and practitioners view the issue of student retention and attrition. This study is informed by models of persistence behavior and prior research testing the plans that make up those models. The primary underlying theoretical framework for the current research is the student withdrawal models described by Tinto’s Model of Student Integration
(1975, 1993), Bean’s Model of Student Attrition (1985) and Astin’s Model of Student Involvement (1975, 1984).

Finally, it is important to note that there are a number of prominent interdisciplinary (critical social theory and critical race theory) and disciplinary-based approaches from the social sciences that provided other perspectives on inquiry in this study. Critical social theory (Agger, 1998) explains how domination and exploitation are reproduced systemically to deny certain populations e.g., low-income and first-generation students equitable opportunities such as attaining a college degree. Social class reproduction theory also provides an important framework in studies of the persistence decisions of first-generation and low-income students. Latter theory emphasizes social class differences that are replicated in social institutions, like colleges and universities (Berger, 2000; Lohfink & Paulsen, 2005; Paulsen & St. John, 2002).

Critical Race Theory (CRT) has its roots in the fields of sociology, history, philosophy, and law. Critical race theorists Ladson-Billings and Tate (1995) offer a critical race theoretical perspective comparable to the critical race theory in legal scholarship that can be applied to educational research in trying to understand educational inequity. Ladson-Billings and Tate (1995) are often credited with introducing Critical Race Theory into educational research and their concept of a critical race theory in the educational reform movement proposes that: (1) race continues to be significant in the United States; (2) U.S. society is based on property rights rather than human rights; and (3) the intersection of race and property creates an analytical tool for understanding inequity (p. 48). Human capital theory also informs the current study because of the importance of examining the costs and benefits of investment in higher education and what factors impact decisions about higher education (Becker, 1993; Paulsen, 2001)

Prior to the development of the Tinto and Bean models, most attrition research had explored countless individual student variables in relation to persistence but did little to tie them together conceptually (Stage, 1988). Most notably, Tinto’s attrition model has become the foundation for most research regarding the issue of student retention.

**Tinto’s Model of Student Integration**

In 1975, Vincent Tinto published a research article that attempted to formulate a theoretical model to explain the processes of the interaction between the individual and the institution that led differing students to drop out of higher education. This research was so
significant that it has prompted decades of research and dialogue on student retention and success in higher education. Though Tinto’s work has been challenged by some critics, his work has remained a dominant theory as to how students navigate through the postsecondary system (Swail, 2003).

Tinto based his model of retention on the work of Durkheim (1951) and Van Gennep (1960) and Spady (1971). Tinto’s Student Integration Model (1975, 1993) theorized that the social integration of students increases their institutional commitment, ultimately reducing the likelihood of student attrition. As Tinto wrote, “It is the interplay between the individual’s commitment to the goal of college completion and his commitment to the institution that determines whether or not the individual decides to drop out (p.96).” Tinto’s theory basically states that student attrition may be attributed to the lack of congruency between students and institutions. Tinto (1975, 1993) asserted that academic dismissal represents only a small portion of the total leaving of students from higher education. Instead, Tinto’s theory suggested that most departures reflected the nature of the student’s social and intellectual experiences within the institution and that the absence of integration arises from incongruence and isolation.

Incongruence, or lack of institutional fit, refers to the state where students perceive themselves as being at odds with the institution. Isolation refers to the absence of sufficient interactions where integration may be achieved and is the state in which students feel largely isolated from the daily life of the institution (Tinto, 1993, p. 50). His model of academic and social integration was designed to explain dropout from a particular institution of higher education and does not try to explain system-wide dropout.

In his model, various types of individual characteristics affected the student’s pre-enrollment commitment to both their goal (i.e. degree attainment) and the institution they were going to attend. The characteristics that Tinto highlighted as being important in influencing the individual’s goal and institutional commitment were their individual attributes, pre-college experiences and family background. Individual attributes cover variables such as race, sex and academic ability. Pre-college experiences cover social and academic experiences like school grade point average and academic and social attainments. Family background covers factors like social status, value climates, and expectational climates. Ultimately, a student’s motivation and academic ability and the institution’s characteristics shape a commitment to an educational goal.
and a commitment to remain in the institution. The higher the student’s goal of completion and/or the level of institutional commitment, the greater the chance of persisting.

In 1993, Tinto refined his theory of student departure to more clearly address how the theory can be applied both to the experience of students of color and adult students and to students at commuting institutions and two-year colleges. In this regard, the revisions to the model clarified the role of multiple college communities in student retention and the ways in which external communities influence a student’s college experience (p. x, 1993).

**Pascarella and Terenzini**

As noted earlier, Tinto’s student integration model has been subjected to a considerable amount of testing and other research studies (Cabrera et. al, 1993; Pascarella & Terenzini, 1977; 1979; 1980). Pascarella and Terenzini (1977) tested the effect of the level of student-faculty interaction on student attrition in a traditional student population. Their experiment was designed to determine whether the amount of non-classroom interaction with academic staff that a student had was predictive of their attrition or retention. This non-classroom interaction with members of faculty staff is potentially important as it raises not only the level of that individual’s academic integration but also their social integration.

Pascarella and Terenzini (1977) examined a sample of 1008 students from the incoming freshman (first-year) class at Syracuse University in New York and found that the amount of informal contact with the faculty was found to discriminate significantly between those students who chose to leave the university and those who chose to persist. Their findings indicated that some students who have certain personality traits are more likely to seek non-classroom contact with members of faculty staff. As a result of this contact they are likely to attain higher levels of both social and academic integration and are more likely to persist at university. However, their results also indicated that the individual student characteristics did not totally account for the difference in frequency of faculty contact for different students.

This experiment was important because it provided compelling evidence of the usefulness of some of the most important aspects of Tinto's model in predicting student attrition in a traditional student body. It also offered an interactive longitudinal look at student attrition. Whereas most studies measure the students’ characteristics once and assess dropout at a later
date, Pascarella and Terenzini (1977) assessed the students at three time points to give a better understanding of the interaction between different factors of the model.

Tierney (1999) argued against Tinto’s reliance on a traditional age for college students, which ignored a large number of older, nontraditional students and failed to take into account the differing circumstances of minority students. Cabrera et al. (1993) also cited that a major gap in Tinto’s theory has been the role of external variables in shaping perceptions and commitments. In their study (Cabrera et al., 1993), the researchers looked at a student population from a large southern urban institution and tried to examine the extent to which Bean and Tinto’s models could be merged to gain more understanding of the process that affects students’ decisions to remain in college. For their analysis, the researchers (Cabrera et al., 1993) used a two-step structural equation modeling strategy and found that when the two theories were merged into one integrated model, a more comprehensive understanding of the complex interplay among the individual, environmental and institutional factors was achieved. Their findings supported Bean’s assertions that environmental factors should be taken into account in explaining persistence processes. However, the generalizability of Cabrera et al.’s (1993) findings to other institutions was questionable since the patterns underlying college persistence vary by type of institution.

**Bean’s Student Attrition Model**

Bean’s (1980) student attrition model and his subsequent conceptual model of non-traditional student attrition (Bean & Metzner, 1985) build upon process models of organizational turnover and attitude behavior interactions (Cabrera et al., 1993). His initial model expanded on the previous work of Tinto (1975) and Astin (1975) by integrating academic variables, student intent, goals, expectations, and external and internal environmental factors into a revised model of persistence. Bean had criticized Tinto for not citing “similarities between leaving the world of work and leaving college,” (p. 158) and suggested there might be similarities between the two. His enhanced 1990 model expanded on his earlier works and incorporated Astin’s (1984) framework of student involvement to include student background, integration, and the external environment as influences on student departure.
Astin’s Theory of Student Involvement

Astin’s theory of student involvement (1984) explained the considerable findings that have emerged from decades of research on student development and, in contrast to Tinto’s framework that emphasized students’ attitudes and perceptions about their experiences, the conceptual constructs of Astin’s (1984) theory of student involvement are based on actual behavior. Student involvement in Astin’s theory was measured using a factor composite of 8 survey items measuring how often students reported participating in school clubs; participating in fine arts activities; attending lectures, conventions, or field trips; going places with friends; having social contact with faculty; attending study groups; meeting with advisor about plans; and talking with faculty outside of class. Astin’s theory of student involvement has its roots in a study of college dropouts (Astin, 1975) that sought to identify factors in the college environment that significantly affected a student’s persistence in college. What Astin concluded was that the factors that contributed to the student’s remaining in college suggested involvement and those that contributed to the student’s dropping out implied a lack of involvement. The most important factor in determining persistence was the student’s residence. Living in a campus residence was positively related to retention and this positive effect occurred in all types of institutions and among all types of students regardless of sex, race, ability, or family background.

The longitudinal study also showed that students who join social fraternities or sororities or participated in extracurricular activities of almost any type and those students holding a part-time job on campus were less likely to drop out. Retention suffers, however, if the student worked off campus at a full-time job. Astin noted this was because the student is spending considerable time and energy on nonacademic activities that are usually unrelated to student life and full-time work off campus decreased the time and energy that the student could devote to studies and other campus activities.

In all of these models, college student outcomes are affected jointly by students’ background characteristics and their college experiences (Knight, 2002). More specifically, important factors influencing college persistence include the student’s intention to persist, college GPA, and the institutional commitment to the student (Cabrera et. al, 1993).
FIRST-GENERATION STUDENTS

First-generation students—students whose parents have not attended college and/or have not earned a college degree—are much less likely to go to college than their peers, particularly in the four-year sector. According to data from the U.S. Department of Education’s National Education Longitudinal Study (NCES, 1994), research on student persistence showed that first-generation college students are at a distinct disadvantage when it comes to postsecondary access, continued enrollment and attaining a degree (NCES, 2002). Of those who began postsecondary education between 1992 and 2000, only 24% had attained a bachelor’s degree or higher, compared with 68% of the students whose parents had at least a bachelor’s degree (Chen & Carroll, 2005). This disadvantage persists even after controlling for other important factors such as educational expectations, academic preparation, support from parents and schools, and family income (NCES, 2002).

According to Hossler, Schmit, and Vesper (1999), parental education levels, rather than income, shaped college aspirations and a student’s ability to realize their aspirations. Research indicates (Ward, 2006) that parent educational attainment is an even more important predictor of educational attainment and college enrollment than family income for low-income and minority students. After controlling for factors such as family income, educational expectations, academic preparation, parental involvement, and peer influence, findings revealed parent education remained a significant predictor for access to postsecondary education and attainment of a bachelor’s degree at 4-year institutions (NCES, 2002).

Manski and Wise (1983) also noted that higher parental education levels increased a student’s odds of applying to a four-year college or university. Nunez and Curraco-Alamin (1998) and Rouse (1994) found that first-generation students were more likely to attend two-year colleges and attend part time than were their non-first-generation peers. Fifty-five percent of first-generation college students attended institutions that were two years or less compared with 35% of those whose parents had at least a bachelor’s degree and 38% attended four-year colleges while 57% of those whose parents were bachelor’s degree recipients did so (Horn, Nevill, & Griffith, 2006).

As a group, first-generation students at 4-year institutions appear to begin college less academically prepared than other students. In particular, first-generation students were less
likely to have taken an advanced math curriculum, which is associated with enrolling in college. Students fail to gain access to the college path as early as eighth grade, when they are less likely to have taken algebra I (Adelman, 2006; Akerhielm, Berger, Hooker, & Wise, 1998) and are less likely than their more advantaged peers to have access to a college preparatory high school curriculum, including honors or advanced placement courses.

**LOW-INCOME STUDENTS**

For the purposes of this study, low-income students were defined as those whose family income was below 150% of the federally established poverty level for their family size. While there has been an increase in the enrollment rates of low-income students, the figures still lag behind those of high-income students by approximately 30% (Mortenson, 1999). Low-income students are often concentrated in communities with high-poverty high schools and are less likely than middle and upper-income students to earn high school diplomas and attend and complete college. In 1999, low-income students continued to be less likely than their non low-income peers to have earned a degree or to still be enrolled in college (NCES, 2002). The U.S. Department of Education reported that in 2004, only 50% of high school completers who came from families in the bottom 20% of family incomes enrolled in college immediately after completing high school (Horn, Nevill, & Griffith, 2006). In contrast, 64% of students from middle-income families and 80% of students from families in the top 20% of family incomes enrolled immediately after high school (Horn, Nevill, & Griffith, 2006).

Students from low-income families are also more likely to attend community college where they are disadvantaged in educational, occupational, and income outcomes (Karen, 2002). According to a 2002 report by Derek Price and the Lumina Foundation, another fundamental barrier for low-income student’s college success is the inability of financial aid programs to make up differences between family financial support and college costs.

There has been a significant body of research on low-income and first generation college students examining the factors that inhibit and enhance success. Ting (1998) found that both cognitive and psychosocial variables are important in predicting the academic performance and academic progress of low-income and first-generation freshmen for the studied university. The research consistently shows that some of the major barriers to success include: 1) lack of self-
confidence; 2) inappropriate expectations or knowledge about college environment; 3) lack of connection to the college community or external community; 4) lack of early validation within the college environment; 5) family members who do not understand the goals of college; and, 6) lack of faculty involvement in summer bridge programs and the transition process (Terenzini, Rendon, Upcraft, Millar, Allison, Gregg, & Jalomo, 1996).

Low-income students, like first-generation students, have specific characteristics that differentiate them from their counterparts. These include the following characteristics (Jenkins, 2006):

**Family and Peer Support:** Low-income students whose parents provided college information and the promise of financial support were much more likely to pursue education at a four-year institution. This is similar to several research findings for first-generation students that suggest that first-generation students who received encouragement and support from their parents were more likely to pursue postsecondary education (Hellman & Harbeck, 1997; Hicks, 2005; Hossler & Gallagher, 1987; Hsiao, 1992; London, 1989; Thayer, 2000).

**Academic Self-Confidence and Personal Aspirations:** Low-income students who felt confident about their academic abilities were much more likely to pursue education at a four-year institution. This is similar to research findings for first-generation students that suggest that first-generation students who experienced academic successes in high school were more likely to pursue postsecondary education (Hicks, 2005; Pascarella, et al., 2004; Riehl, 2004).

**Course Work and Academic Achievement:** Low-income students who took higher level math classes were more likely to pursue education at a four-year institution. This is similar to research findings for first-generation students indicating that first-generation students who took advanced math classes past Algebra II were more likely to obtain a baccalaureate degree (Adelman, 1999; Choy, 2001; Trusty & Niles, 2003).

**College Information, Financing, and Preparation:** Low-income students who received guidance and information from the school counselor were much more likely to pursue education at a four-year institution. This is similar to research findings for first-generation students that suggest that the first-generation students who utilized the school counselor to assist with planning and preparing for college were more likely to attend a four-year college (Rodriguez, 2003; Rowe, 1989).
STUDENT FINANCIAL AID AND HIGHER EDUCATION TRENDS

Students and their families pay only a fraction of the cost of higher education; the balance comes from a variety of sources including general subsidies such as grants (federal, state, or institutional), loans (subsidized or unsubsidized), work-study, and tax incentives. Although the state’s share of funding appropriation for postsecondary institutions has decreased, state governments are still the largest source of revenue for public institutions (State Higher Education Executive Officers, 2008). During the post-World War II expansion, state appropriations made the greatest contribution to the diversification and democratization of higher education. Today, state appropriations continue to provide the most money per student to subsidize and develop research universities, state colleges and universities, and junior and community colleges (Finney & Kelly, 2004).

Contrary to the impression that state support for higher education has been falling, research has shown that the level of state funding has actually kept pace with both enrollment increases and inflation (Toutkoushian, 2001). State funding however, has not grown at the same rate as overall expenditures. While public institutions relied on government sources for over two-thirds of their net E&G revenue in 1995, the share of revenues coming from government has steadily been falling (Toutkoushian, 2001). Overall, the share of total costs covered by state appropriations has declined, while tuition and fees have increased.

Ultimately, state budget cuts often end up hurting students the most, especially considering the rate at which tuition increases and the overall price of college keeps climbing (St. John, 2003). Adjusted for inflation, tuition at public four-year colleges and universities increased at four times the pace of the median family income during the last decade (National Center for Public Policy and Higher Education, 2002). As a result, today’s students have to bear a larger share of the financial burden for paying for college than ever before.

Loans and Grant Aid

According to the College Board’s 2004 report on Trends in Student Aid, total aid over the past decade, after adjusting for inflation, has increased by 122%, grant aid has increased by 84%, and education loan volume has increased by 137%. For the 2003-2004 academic year loans constituted 56% of aid, grants 38%, work one percent, and education tax benefits five
percent. All forms of student aid are rapidly increasing, but students are relying more heavily on private loans. In 1994, private loans provided exclusively for students through commercial and state sources were about five percent of federal student loan volume (College Board, 2005).

As the price of attending college has increased and family incomes, grant aid, and federal loans have failed to keep pace, the volume of student borrowing from private sources has skyrocketed and now equals about 22% of federal education loan volume. During the 2004-05 academic year about $129 billion in financial aid was distributed to undergraduate and graduate students in the form of grants, work-study, federal loans, and federal tax credits and deductions. In addition, these students borrowed almost $14 billion dollars from nonfederal sources to help finance their education (College Board, 2005).

In 2003-2004, the Pell Grant program, considered the cornerstone of aid for low-income students, funded 5.1 million students with average grants of $2,466 (College Board, 2004). The purchasing power of the Pell Grant has been fairly stable over the past decade, but has declined considerably over the long-term. For example, in 1979–1980, the maximum grant covered 99% of the average price of tuition, fees, and on-campus room and board at a public two-year institution, 77% of these prices at a public four-year institution, and 36% of these prices at a private not-for-profit college or university (King, 2003). In 2003, the maximum grant covered 68%, 41%, and 16% of these prices, respectively (King, 2003).

Institutional aid constitutes about half of all grant aid received by students. After adjusting for inflation, institutional grants have doubled over the past decade. About 25% of full-time undergraduate students enrolled in public colleges and universities and 60% at private institutions receive institutional grant aid (Ruppert, 2003). Grant aid and tuition tax credits and deductions reduce the average price that students and families actually pay for college. On average, full-time students receive about $9,600 of aid in the form of grants and tax benefit in private four-year institutions, $3,300 in public four-year institutions, and $1,800 in public two-year colleges (College Board, 2005).

Over the past two decades, changes in state funding, tuition and financial aid have made postsecondary affordability a growing problem. While the average cost of college tuition has risen by 110% over the past 20 years, median family income has risen by only 27% (College Board, 2005). And while state and federal support for financial aid has increased over the past decade, it has not kept pace with tuition increases.
The rising price of a college education, as well as a decline in need-based aid, places low-income students in jeopardy of not being able to continue their education at the postsecondary level (St. John, 2003). Studies show that the price of tuition and the amount of financial aid available heavily influence low-income students’ decision on whether to apply to and attend college (Heller, 1997). A student can receive all the preparation necessary to succeed at the postsecondary level and still not be able to afford a college education.

FINANCIAL AID AND PERSISTENCE

Much of the research on financial aid was performed by economists who were primarily concerned with understanding theories of cost and student price response to financial aid and tuition (Heller, 1997; Leslie & Brinkman, 1987; Zeidner, 2006). In 1987, Leslie and Brinkman published a review of the literature on the relationships between price and enrollment and higher education. Their research demonstrated the importance of student demand and price in higher education. Since then, there have been several student demand studies that examine the relationship between price and higher education enrollments (Heller, 1997). Leslie and Brinkman (1987) found that for every $100 increase in tuition price, one could expect the participation rate to drop three quarters of a percentage point.

Since Leslie and Brinkman’s study, many of new studies in student demands have been published and focused on the effect of financial aid and changes in aid on students from different races, incomes, and colleges. Kane (1991) examined the enrollment patterns of Blacks and Whites from two national data sets, the National Longitudinal Survey of Youth (NLSY) and the Current Population Survey (CPS), and found that higher levels of tuition were associated with lower enrollment rates for Black students. St. John (1990), similar to the methods employed by Leslie and Brinkman (1987), used cross-sectional analysis to analyze the sophomore cohort of the High School & Beyond (HSB) survey and found that a $1,000 increase in tuition decreased enrollment rates by 2.8 percent. McPherson and Shapiro (1991) analyzed 11 years of CPS data to examine the enrollment patterns of White students in three income categories. They found a student price response coefficient (SPRC) of -0.68 for low-income student associated with a $100 tuition increase. All of the studies here are consistent with the finding that each found an inverse relationship between tuition and enrollment rates.
Some researchers have found that grant and scholarship aid are unrelated to persistence (Peng & Fetters, 1978; Moline 1987) while others have concluded that loans, as well as grants provide positive effects on enrollment generally (Dynarski, 2002; Heller, 1997; St. John, 1990). Bettinger (2004) examined the effect of Pell grants on student persistence after the first year for student enrolled in Ohio public colleges using a model that accounted for the effects of the level of aid, as well as the student’s personal and academic characteristics to persist. He concluded that student dropout behavior is inversely related to the amount of Pell grant dollars received. However, analyzing within-year persistence of students in the 1987 National Postsecondary Student Aid Study, St. John and other colleagues (1994) found negative effects of grants and loans on persistence, particularly in samples of low-income students.

Many studies examining the role of finances on persistence have found that financial aid may influence persistence indirectly. Cabrera, Nora, and Castaneda (1992) found that, although financial aid was not directly related to persistence among full-time, unmarried, dependent freshmen attending one public commuter institution in 1998, receiving aid increased persistence indirectly through cumulative grade point average. Receiving financial aid has the third largest total effect on persistence from the first to second year, with only intent to persist and cumulative grade point average having larger effects. In an effort to build on the strengths and weakness of prior research, Perna (1998) used the Beginning Postsecondary Longitudinal Study of 1989-90 for freshman and path analyses to examine the effects of receiving financial aid on persistence, but also the effects of the amounts of aid received, the types of aid received, and the combination or package of aid received. The results of the study found that the direct effect of receiving financial aid on bachelor’s degree completion were marginal; receiving work-study and receiving an aid package that contained only grants both had positive direct effects on persistence; grants were more effective in promoting persistence than loans; and financial aid influenced persistence indirectly through college grades.

ACADEMIC PERFORMANCE AND PERSISTENCE

Academic integration and preparation are primary features of many models of retention (Swail Redd, & Perna, 2003). Without the prerequisite skills needed to survive the rigorous curricula of most college campuses, many students underachieve and leave college during their
freshman year or before their sophomore year begins (Astin, 1975; Tinto, 1975; Richardson & Skinner, 1992). Research shows that the level of academic preparation in high school is positively related to high school graduation rates, college entrance examination scores, predisposition toward college, college enrollment, rates of transfer from a two-year to a four-year institution, progress toward earning a bachelor’s degree by age 30, college persistence rates, and college completion rates (Kirby & Sharpe, 2001; McGrath & Braunstein, 1997; Ryland, Riordan, & Brack, 1994; Swail, Redd, & Perna, 2003). Studies have also concluded that there are pre-college factors such as work experiences and family educational level which are influential in determining persistence to the second year of college (Nora, Cabrera, Hagedorn, & Pascarella, 1996; Tierney & Hagedorn, 2002). Prior research studies of college student departure underscore the importance of the first year in the process of persistence and data from the National Education Longitudinal Study, High School and Beyond studies, and American College Testing Program show that the largest proportion of institutional attrition occurs in that year and prior to the beginning of the second year (Tinto, 1993, p.14).

In education, academic preparedness is often defined on the basis of students’ pre-college academic performance as measured by one or more of the following, high school GPA, high school rank, college entrance test scores, high school college preparatory courses, advanced placement courses, the quality of high school attended, and quality and intensity of high school curriculum. A number of research studies have correlated academic preparedness of minority and non-minority students with their persistence and college completion rates (Adelman, 1999; Borman, Stringfield, & Rachuba, 2000; Fiske, 1988; Parker, 1997; Richardson, Simmons, & De Los Santos, 1987). Other studies also found significant correlations between academic preparation and persistence for low achievers (Porter, 1989) and Hispanic students (Astin, 1982). These findings support Tinto’s theory (1975) of academic integration and college persistence.

Although prior research confirms that enrolling and succeeding in college requires students to become academically prepared, groups of underrepresented students continue to be less academically prepared for college (Tierney et. al, 2005). The research literature also shows that access to high quality academic preparation is uneven for low-income and other disadvantaged students. Data reported in Measuring Up 2000 noted that the level of access to high-quality of academic preparation was less for Blacks and Hispanics than whites. Analyses of data from the National Educational Longitudinal Study: 92/94 [NELS: 92/94] also shows that
a smaller share of Black and Hispanic high school graduates are academically prepared for college (Berkner & Chavez, 1997; Tierney et. al, 2005). Academic preparation also varies by family income (Berkner & Chavez, 1997). Analyses from the NELS:88/94 data concluded that only 29% of high school seniors in the lowest socioeconomic quartile were minimally academically qualified to enroll in a four-year college or university, compared with 70% of students in the highest socioeconomic status quartile (Cabrera & La Nasa, 2000a, 2000b, 2001). Beginning Postsecondary Student survey [BPS: 95/98] showed that among students who were enrolled in a four-year college or university in 1995-96, only 15% were from low-income families and 17% from middle-income.

In light of the barriers faced by disadvantaged students, pre-collegiate programs offer a systematic approach for raising the academic level of these students. In turn, this higher level of quality in academic preparedness will have an impact on college enrollment and persistence rates for disadvantaged and underrepresented students. Academic preparation is a key component of many currently existing pre-collegiate preparation programs such as Upward Bound, Talent Search, and GEAR-UP (Jun & Tierney, 1999; Perna & Swail, 2001; Tierney et. al, 2005). Tierney et. al (2005) described in detail how pre-collegiate preparation programs can ensure that all students are sufficiently academically prepared to enroll and succeed in college. These steps include: (1) Ensuring rigorous academic preparation; (2) Beginning efforts to improve academic preparation before student enter high school; (3) Delivering academic preparation activities in culturally appropriate ways; and (4) Coordinating with K-12 and college educators.
Conceptual Framework

Relevant research theories in college student development and college student departure form the foundation for this study and the conceptual framework that guided this study are found in Figure 1. This framework serves as a travel map and helps explain the research design and methods for this study. Previous studies have found that there is a direct effect of receiving financial aid on bachelor’s degree completion where financial aid, particularly grants and scholarships, influenced persistence indirectly through college grades. While research (Astin, 1975; Bettinger, 2004; Murdock, 1987) has informed policy makers about the overall effect of financial aid and persistence, as well as, how sensitive persistence decisions are to different types of aid (Perna, 1998), and the effectiveness of certain aid packages on minorities (Astin, 1975; St. John, 1990), little information is provided as to what potential role pre-college programs could have on financial aid attainment which could in turn influence college GPA and first-year persistence.

Figure 1. Conceptual Framework
CHAPTER THREE

METHODOLOGY

Precollege programs help develop the pipeline of students interested in attending college and many institutions place considerable resources into their development. Although these programs help motivate students and provide important academic support to disadvantaged students, the most current outreach program evaluation data is unreliable and provides little information about the actual impact of the program on students. The purpose of this study was to examine the effect of participation in a pre-collegiate academic outreach program on first-year financial aid attainment, academic achievement, and persistence. This chapter details the research processes used to examine the research questions of the study. The methodology covers a description of the research population, selection of the research sample, research design, data collection procedures, data analysis, variables and measures, and research limitations. The quantitative data collected for this study were analyzed based on various pre-college and background characteristics including high school GPA, test scores, gender and race. The conceptual framework based upon the literature review in chapter two is guided this study.

RESEARCH QUESTIONS

Are pre-collegiate participants awarded significantly larger gift financial aid packages than non-program participants?
Do pre-collegiate participants obtain significantly higher first-year GPA’s than non-program participants?
Do pre-collegiate participants persist at a significantly higher rate than non-program participants?

RESEARCH POPULATION AND PARTICIPANTS

The research population included first time in college (FTIC) full-time undergraduate degree-seeking students attending a public university between 2003 and 2006. In 2010, this particular university, located in a medium-sized suburban area, had an overall population of over
40,200. The specific groups of interest within this population were traditional age undergraduate college students, mostly age 18 -22, who have been identified as low-income students admitted to college under special admission criteria. The population for this study was identified with assistance from the University’s Office of Institutional Research and the Office of Undergraduate Studies. Permission to access all data was granted by the University Institutional Review Board for Research Involving Human Subjects. The approval letter can be found in Appendix A.

In the 2003-2004 admissions cohort, 6,048 full-time degree-seeking FTIC undergraduate students enrolled at the University. In the 2004-2005 admissions cohort, 6,196 FTIC undergraduate students enrolled at the University. Finally, for the 2004-2005 and 2006-2007 cohorts, 6,021 and 6,176 FTIC students enrolled, respectively. Of those students, 1,197 students were identified as the sample for this study.

**SELECTION OF THE RESEARCH SAMPLE**

The accessible sample consisted of students entering the University from Summer 2003 to Summer 2006 through the University’s Summer Bridge Program. This sample of 1,197 students included FTIC degree-seeking low-income undergraduate students admitted to the University under special admission criteria as participants in the Summer Bridge Program (SBP).

The university selected as a study site is a public, four-year, doctoral granting institution in the southeast region of the United States. From Fall 2003 to Fall 2006, the total average enrollment at the institution included 38,609 students (University Office of Institutional Research, 2010). On average, undergraduate students accounted for 30,533 of the student body. In Fall 2006, the full-time undergraduate student population was 43.2% male and 56.8% female. The racial breakdown of the full-time undergraduate students for this same year included 73% White students, 11.3% Black students, 10.8% Hispanic students, and 3.7% other racial/ethnic students.

The study site was also chosen due to the similarity in terms of admission criteria, minority students, number of Pell eligible students, and gender representation of its undergraduate student populations to other public Research I institutions in the United States. This University was also chosen because it is supportive of the study, and supports the researcher
who was an employee in a similar University retention program involving educationally and economically disadvantaged students.

**RESEARCH DESIGN**

In this study, the effect of participation in a pre-collegiate academic outreach program on the financial aid attainment, academic performance, and persistence of low-income students enrolled in a public state university was examined. The sample for this study consisted of four cohorts of FTIC, full-time freshman students who in enrolled in the University through the Summer Bridge Program between the summers of 2003 and 2006 (n=1197).

As illustrated in Table 1, the research design utilized for this ex post facto quantitative study was a quasi-experimental nonequivalent groups design. The Non-Equivalent Groups Design (hereafter NEGD) is one of the most frequently used designs in social research (Trochim, 2005). NEGD is structured like a pretest-posttest randomized experiment, but lacks random assignment. In other words, the researcher did not control the assignment to groups through the mechanism of random assignment. As a result, the groups may be different prior to the study. In NEGD, the researcher tries to select groups that are as similar as possible in order to fairly compare the treated group with the comparison group. In this study, all students in the sample are participants of the Summer Bridge Program which was only used as a sample frame for low-income students. The researcher used intact cohort groups that are similar as the treatment and control groups.

**DATA COLLECTION PROCEDURES**

Data gathered from existing institutional databases were used in this study. Use of institutional data presented an advantage over the use of participant completed surveys. This study used financial, academic, and demographic data from Business Objects, the university’s student information database, the Office of Admissions, the Office of Student Financial Aid, and the Center for Academic Retention and Enhancement. Already documented information collected from the FSU admissions application, the Office of Admissions student database, Registrar’s Office, and the Center for Academic Retention and Enhancement was used to determine a student’s participation in a pre-collegiate academic outreach program, student pre-
entry demographic and family attributes (e.g., race/ethnicity, gender, parent educational attainment, and income) and student pre-college academic attributes (e.g., H.S. GPA, SAT/ACT score).

Verification of student grade point averages at the end of their first year (academic performance) and student enrollment for the fall semester of their second year was confirmed by data from Business Objects, the Registrar’s Office, and the Summer Bridge Program Annual Retention reports. The Center for Academic Retention and Enhancement also maintains a database of student information initiated during the admission process and maintained throughout the student’s college tenure.

**VARIABLES AND MEASURES**

**Pre-Collegiate Academic Outreach Programs:** A dichotomous variable measuring whether or not a student participated in a pre-collegiate academic outreach program in high school (participant coded as “1”; non-participant coded as “0”).

**Gift Financial Aid:** Gift financial aid is a continuous variable and for this study was defined as the total financial assistance awarded in the form of grants and scholarships with no repayment required were examined. In this study, only gift financial aid awarded during the freshman Fall semester was measured. In addition, the financial aid amounts awarded to the students at the beginning of their freshman Fall semester rather than the amount actually received will be used.

**Academic Achievement:** In this study, academic achievement was measured using the cumulative first-year college grade point average (GPA). In the statistical analysis for the study, college GPA is a continuous variable.

**First-Year Persistence:** In this study, first-year persistence is a dichotomous variable defined as continued matriculation of each entering freshman cohort from their freshman Fall semester to their sophomore Fall semester. For the first-year persistence outcome variable, first-year students who enrolled in the Fall semester and re-enrolled the following Fall semester were coded as “1”; for students who did not enroll in the following Fall semester, were coded at “0”. The term first-year persistence is used interchangeably with the term retention. In this study, institutional persistence rather than system persistence was examined.
**High School Grades**: This is a continuous variable measured by grade point average.

**SAT Score**: College admissions test scores are standardized. Each case in the sample had either a standardized SAT score, ACT score, or both. In order to include all cases for the subjects that took either the SAT or ACT, but not both, the researcher found those cases who had only taken the ACT and converted their ACT score to a SAT score. All ACT scores were converted using the official ACT to SAT Conversion table.

**OTHER CONTROLLED FOR VARIABLES**

**Female**: Males were the reference group and coded as “0”; females coded as “1”.

**Minority**: Whites were the reference group and coded as “0” with all other minorities coded as “1”. This group would include Black, Hispanic, Asian, American Indian, Multi-ethnic and ‘other ethnicity’.

**DATA ANALYSIS**

Data downloaded from the University’s databases were entered into an Excel file and then loaded by the researcher into the Statistical Package for the Social Sciences (SPSS), where these data were manipulated. The goal of this particular statistical analysis was to find if there were variables evidenced by those students who participated in a pre-collegiate academic outreach programs that could affect financial aid attainment, college performance and persistence. Two different types of regression models were used in the data analysis for the study. The primary research method analysis used to examine whether participation in a pre-collegiate academic outreach program affects financial aid attainment and academic achievement was hierarchical multiple regression. The primary analysis used to explore the dichotomous outcome variable of persistence binomial logistic regression.

These particular statistical analyses were used to logically align the data analysis with the research questions posed in the study. First, using multiple regression, participation in a pre-collegiate academic outreach program and its affect on financial aid attainment was examined. Next, college GPA as the dependent variable was analyzed also using multiple regression and included pre-collegiate program participation and financial aid as independent variables in two separate steps (sequentially). Finally, student persistence was examined using logistic regression.
by sequentially by including other relevant background variables (race, gender, HS GPA, SAT test scores,) and pre-collegiate program participation first, then financial aid, then college GPAs. The logic in this analysis is that financial aid could affect college performance, and both then could influence persistence. In addition, descriptive explorations, including mean comparisons, ANOVAs and cross-tabs comparing students who are pre-collegiate academic program participants versus non-participants were run using SPSS. The statistical procedures used for each question is summarized in Table 1.

SPSS provided frequency tables that generated descriptive statistics of the cohorts. The SPSS program also created cross tabulation tables to determine additional characteristics of the pre-collegiate program participants and the non-participants. Cross tabulation (or the term “crosstabs”) tables are used to find frequency of occurrence of two or more categorical variables compared together. While the “Frequency” command in SPSS provides lists of information, the crosstabs command compares three or more variables.
Table 1. Research Questions and Analysis Method

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Statistical Method(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. 1: Were pre-collegiate participants awarded significantly larger gift financial aid packages than non-program participants?</td>
<td>Multiple Regression</td>
</tr>
<tr>
<td>No. 2: Did pre-collegiate participants obtain significantly higher first-year GPA’s than non-program participants?</td>
<td>Multiple Regression</td>
</tr>
<tr>
<td>No. 3: Did pre-collegiate participants persist at a significantly higher rate than non-program participants?</td>
<td>Logistic Regression</td>
</tr>
</tbody>
</table>

Multiple Regression-Financial Aid and Academic Achievement Outcomes

The general purpose of multiple regression is to learn more about the relationship between several independent or predictor variables and a dependent or variable. Multiple regression is most effective at identifying relationships between a dependent variable and a combination of independent variables when the following assumptions are met. First, each of the variables are normally distributed. Highly skewed variables or variables with substantial outliers can distort relationships and significance tests. Second, the relationships between dependent and independent variables are linear. If the relationship between independent variables and the dependent variable is not linear, the results of the regression analysis will underestimate the true relationship. The last assumption the multiple linear regression analysis makes is homoscedasticity. Homoscedasticity means that the variance of errors is the same across all levels of the independent variable. When the variance of errors differs at different values of the independent variable, heteroscedasticity is indicated.
Hierarchical multiple regression was used to explore the financial aid and academic achievement dependent variables. Independent variables and other controlled for background variables (race, gender, HS GPA, SAT test scores) were entered into the regression model in an order determined by past research and researcher expectations. Hierarchical regression adds variables to the regression model in stages. At each stage, an additional variable is added to the model and the change in $R^2$ is calculated. For the data analysis, variables were entered in blocks. The multiple regression equation model specified for examining financial aid attainment and academic achievement in the study is:

$$Y = \beta_0 + B_1X_1 + B_2X_2 + B_3X_3 + \ldots$$

$Y$ is the value of the dependent variable (Y), $\beta_0$ is the constant or intercept, $B_1$ is the Slope (Beta coefficient) for $X_1$; $X_1$ is the first independent variable that is explaining the variance in $Y$, $B_2$ is the Slope (Beta coefficient) for $X_2$; $X_2$ is the second independent variable that is explaining the variance in $Y$; $B_3$ is the Slope (Beta coefficient) for $X_3$; $X_3$ is the third independent variable that is explaining the variance in $Y$ and so on.

**Logistic Regression and Persistence Outcome**

A binomial logistic regression was used to measure the effects of pre-collegiate program participation on the dichotomous variables of first-year postsecondary persistence (1-persisted or 0-failed to persist).

The variables listed below were chosen after an examination of the available literature on persistence and disadvantaged students and an examination of the available data. Binomial Logistic regression is useful for situations in which you want to be able to predict the presence or absence of a characteristic or outcome based on values of a set of predictor variables. It is similar to a linear regression model but is suited to models where the dependent variable is dichotomous. Logistic regression coefficients can be used to estimate odds ratios for each of the independent variables in the model. The logistic regression equation model specified for examining persistence in the study is:

$$Y = \log \left( \frac{p_i}{1-p_i} \right) = \alpha + \beta x + e_i$$
In examining persistence, \( p_i \) is the probability that student \( i \) will persist; \( x \) is series of variables involving student background (pre-collegiate program participation, gender, race, high school GPA, SAT test score), gift financial aid package and college GPA; \( \beta \) is the estimated regression coefficients of the predictor variables; and \( e_i \) represents a random error term. The outcome variable \( Y \) is coded 0 for those who did not persist to the Fall semester of their sophomore year and 1 for those who did persist. For this analysis, the following variables were included in the model:

\[
X_1 = \text{Participation in a pre-collegiate academic outreach program (a dichotomous variable; 0-participant, 1-non-participant)}
\]

\[
X_2 = \text{Female (a dichotomous variable; 0-male, 1-female)}
\]

\[
X_3 = \text{Minority (categorical variable with whites as the reference group; 0-white, 1-minority)}
\]

\[
X_4 = \text{High School GPA (continuous variable)}
\]

\[
X_5 = \text{SAT score (continuous variable)}
\]

\[
X_6 = \text{Gift financial aid consisting of only grants and scholarship dollars (continuous variable)}
\]

\[
X_7 = \text{College GPA (continuous variable)}
\]

First, a logistic regression examining persistence for students who participated in a pre-collegiate academic outreach program was conducted. This step helped to examine whether program participants made different persistence decisions than non-participants. SPSS allows different steps in the logistic regression mode. The difference between steps is how the predictors are included. Variables may be blocked into groups or entered into the equation one at a time. Sequential logistic regressions that involved entering variables into the equation one by one was first conducted to examine the net effects of predicting variables on the criterion value of student persistence (enrollment to second year). Seven variables were first entered as a group (Pre-collegiate program participation, Female, Minority, High School GPA, SAT Score, Gift Financial Aid, and College GPA). This analysis was followed by another run of the logistic regression that involved entering variables one by one in seven separate blocks: (Block 1) Pre-collegiate program participation; (Block 2) Female; (Block 3) Minority; (Block 4) High School GPA; (Block 5) SAT Score; (Block 6) Gift Financial Aid (no repayment required); and (Block 7)
College GPA. Both analyses were conducted to find the best fit model and to predict persistence based on key variables.

Cross-tabulation analyses were also undertaken for the sample. Statistics from this step could provide valuable information about the overall persistence rates of students who participated in a pre-collegiate academic outreach program. For example, if a statistical difference was found in persistence by pre-collegiate program participants, then it would suggest there was a significant difference in overall persistence rates by pre-collegiate program participants. However, it is important to note that cross-tabulation is only an indication of overall difference in outcome and does not control for other factors nor does it explain if the differences could be due to other contributing variables.

ASSUMPTIONS IN THE DATA ANALYSIS

In running the analysis for this study there are assumptions made about model specification. While logistic regression does not make many of the key assumptions of linear regression and general linear models because it does not need a linear relationship between the dependent and independent variables. However some other assumptions still apply (Hosmer & Lemeshow, 2000). First, logistic regression requires the dependent variable to be binary. Second, since logistic regression assumes that \( P(Y=1) \) is the probability of the event occurring, it is necessary that the dependent variable is coded accordingly. That is for the factor defined “1” the dependent variable should represent the desired outcome. Third, the logistic regression model should be fitted correctly with only the meaningful variables included. Similarly, all meaningful variables should be included. The stepwise method is a good approach to ensure this happens. Fourth, the error terms need to be independent. Logistic regression requires each observation to be independent. That is that the data-points should not be from any dependent samples design such as before-after measurements, or matched pairings. The model should have little or no multicollinearity. That is that the independent variables should be independent from each other. There is also the option to include interaction effects of categorical variables in the analysis and the model. Fifth, logistic regression assumes linearity of independent variables and log odds.

Although logistic regression does not require the dependent and independent variables to be related linearly, it does require that the independent variables be linearly related to the log odds. Otherwise, the logistic regression can underestimate the strength of the relationship.
showing a not significant result where it should be significant. Lastly, logistic regression requires large sample sizes. Large sample sizes are required for logistic regression to provide sufficient numbers in both categories of the response variable. The more explanatory variables, the larger the sample size required. With small sample sizes, the Hosmer–Lemeshow test has low power and is unlikely to detect subtle deviations from the logistic model. Hosmer and Lemeshow (2000) recommend sample sizes greater than 400.

LIMITATIONS OF THE RESEARCH

As expected, this dissertation has limitations. This collection of four-year data has several limitations that are important when interpreting the study’s results. The sample is restricted to students who attend the University and who were previously enrolled in the Summer Bridge Program from Summer 2003 to Summer 2006. The study was also delimited because the sample involved a cohort of entering students in a single university. Therefore, the generalizability and utility of the findings are constrained and are generalizable only to this institution. The student population in the treatment groups is also fairly small and homogeneous when considering the institution’s total population and diverse make-up, limiting the statistical “spread,” and reducing the generalizablity of the findings. In addition, participation in a pre-collegiate academic program was designated by the student and then coded by the institution. The potential existed that the designation may have been coded erroneously.

Internal validity could be impacted by subject characteristics, because the students in the Summer Bridge Program sample group could have been more developed, in regards to the cognitive factors that are being examined, before the start of the study. This threat could be addressed by examining the comparison of entering students’ demographic data to see if these students may have been successful regardless of program participation. High school grade point average could be a confounding variable because participation in a pre-collegiate academic outreach program could increase high school grade point average, but it is also reasonable that a desire and motivation to do well in school means that a person has high education aspiration, studies more and their grade point average is high. It is also possible that other confounding variables not included in the analysis exist. This study also does not address the compelling question of whether participation in certain high school programs improves the odds of students
persisting in college, or if students with stronger commitment to persist in college are more likely to participate in certain programs in high school.

In the study, institutional persistence rather than system-wide persistence was examined. Therefore, any students who transferred from the chosen site institution were counted as non-persisters, which is another limitation of this data set. Indeed, counting students who transferred to other state institutions as persisters would be more appropriate from the state policy perspective, however, this study is narrowly focused on the persistence of low-income students within an institution.

Another possible limitation of this study is researcher bias. Because of the researcher’s background as an educator and previous work experience as the administrator of a pre-collegiate academic outreach program there may be an attitude of bias toward pre-collegiate programs having a positive impact on student outcomes. Scheurich (1994) noted that one's historical position, one's class, one's race, one's gender, one's religion and so on may all interact and influence, limit and constrain the production of knowledge. My perspective as a researcher, my beliefs about the research being conducted, the chosen methodologies, and the research questions have been formed by my prior knowledge and experience. As a conscientious researcher, I admit to the biases of which I am aware. Since this will be a quantitative study, research credibility can be established through the transparency of the data and the extent to which others have access to the actual data of the study.

Finally, a common limitation when using non-experimental ex-post facto data sources is that there is no “random assignment” in the treatment groups. The events reported have already transpired and the independent variable cannot be manipulated as advocated in experimental designs (Fraenkel & Wallen, 2003).

**SUMMARY**

The goal of this study was to investigate the impact of pre-collegiate academic outreach programs on the financial aid attainment, academic achievement, and persistence of first-time in college low-income students enrolled in a four-year college. A combination of inferential and descriptive statistics was used to answer the research questions; with research questions one and two using multiple regression and research question three answered using logistic regression.
Existing institutional data on students enrolled in the University’s Summer Bridge Program serves as the primary dataset analyzed in this study and has been explained in this chapter. Further, this chapter has defined the variables of interest, explained the data collection procedures, detailed a conceptual framework and characteristics of the data available, discussed the coding of variables, and presented the statistical model and assumptions adopted for the data analysis. Finally, the limitations of the study were discussed.
CHAPTER FOUR

RESULTS

The purpose of this research project was to identify the effects of participation in a pre-collegiate academic outreach programs on the first-year financial aid attainment, academic performance, and persistence of first-generation, low-income college freshmen. This chapter presents the statistical analysis and descriptive findings obtained from this research using the Statistical Package for the Social Sciences (SPSS, 2010, 19.0). The following illustrates how the statistical procedures described in Chapter Three were used to address the research questions of this study. This data analysis used a logical and sequential series of analysis techniques which included descriptive and frequency statistics, correlations, ANOVAs, and chi square tests. The analysis is organized to correspond in sequence with the three research questions and related hypotheses presented in Chapters One and Three. This chapter first presents descriptive statistics for all the variables, and also provides the results of the statistical analysis.

1. Are pre-collegiate participants awarded significantly larger gift financial aid packages than non-program participants?
2. Do pre-collegiate participants obtain significantly higher first-year GPA’s than non-program participants?
3. Do pre-collegiate participants persist at a significantly higher rate than non-program participants?

DESCRIPTIVE ANALYSIS

The following is a presentation of the demographic and background characteristics of four cohorts of students in an effort to clarify and understand the student subjects in this study. The sample for this study was identified through data gathered from existing institutional databases. The combined four cohorts from 2003-2006 consisted of 1,197 first-time in college freshman admitted to the University through the school’s Summer Bridge Program. All participants in these cohort groups were traditional-aged students who had graduated from an accredited high school in the spring prior to matriculating to the University in the summer.
semester. SPSS was used to elicit descriptive statistics on the various demographics of these cohorts.

**Cohort Demographics**

When examining the total number of 1,197 students in the sample, the researcher found that 217 students (18.1%) participated in a pre-collegiate outreach program in high school and 980 (81.9%) of the students did not participate in a pre-collegiate academic program in high school. The number and percentage of students by type for each cohort year are as follows: the 2003 cohort consisted of 44 (15.7%) pre-collegiate program participants and 236 (84.3%) nonparticipants; the 2004 cohort consisted of 43 (14.9%) pre-collegiate program participants and 245 (85.1%) non-participants; the 2005 cohort consisted of 68 (22.0%) pre-collegiate program participants and 241 (78.0%) non-participants; and the 2006 cohort consisted of 62 (19.4%) pre-collegiate program participants and 258 (80.6%) non-participants.

**Race and Gender Demographics**

The majority of students in the sample were students of color (N=1,008). The racial distribution was 189 (15.8%) Whites or Caucasians, 750 (62.7%) Blacks, 221 (18.5%) Hispanics, and 37 (3%) students for other ethnicity. The racial distribution of students who were participants in a pre-collegiate academic outreach program (N=217) consisted of 5 (2.3%) Whites, 199 (91.7%) Blacks, 11 (5.0%) Hispanics, and 2 (0.9%) Asians. These numbers were not comparable with the racial representation of the general population of first-year students at the institution being studied where on average between 2003 and 2006 Blacks, Hispanics and other ethnicities only accounted for 25% of the population.

Of the study participants (N=1,197), 845 (70.6%) were females and 352 (29.4%) were males. The percentage of women in the cohorts was higher than the institutional average of all females enrolled full-time during the same four-year period (58.6%). The demographic listing of race/ethnicity provided an overall view of the cohorts.

**Financial Aid**

All students in the sample (N=1,197), were awarded some type of gift financial aid in the form of scholarships or grants. The average gift financial aid award for the total sample was $3,810 with the average award for pre-collegiate program participants being $3,926 and $3,743 for non-program participants. Self-help financial aid in the form of student loans and work-study
programs were also awarded to all students in the sample. Self-help financial aid for the total sample averaged $1,523. For pre-collegiate program participants, the average self-help financial aid award was $1,467 and for non-participants the average award was $1,531.

When examining race, White students in the sample (N=189) were awarded the lowest dollar amount of gift financial aid while Black students in the sample (N=750) were awarded the highest dollar amount. White students in the sample (N=189) were awarded an average gift financial aid package of $3,144 and $1,518 in loans; Blacks were awarded an average gift financial aid package of $4,054 and $1,557 in loans; Hispanics were awarded an average gift financial aid package of $3,581 and $1,396 in loans.

**Grade Point Average and Test Scores**

The average high school GPA was 3.26 for the entire sample (N=1,197). The average high school GPA for pre-collegiate program participants (N=217) was 3.31 and the average high school GPA for non-participants (N=980) was a 3.24. The average first-year college GPA for the entire sample was 2.67. The average first-year cumulative college GPA was 2.51 for pre-collegiate program participants and 2.71 for non-participants. In terms of test scores, the average SAT score for the entire sample was 967. Pre-collegiate program participants averaged a 959 on the SAT while non-participants averaged a 968 on the SAT.

**Persistence**

According to the descriptive data, 1,077 (90.0%) students from the total sample persisted to their sophomore year. This figure consists of 189 (87.1%) of all pre-collegiate program participants (N=217) persisting and 888 (90.6%) of all non-program participants persisting (N=980). Female students in the sample (N=845) showed better persistence rates than male students in the sample (N=352), with 91.0% (767) of all female students persisting to their sophomore year compared to 88.1% (310) of male students in the sample. Interestingly, White students in the total sample (N=189) had the lowest persistence rate with only 86.8% (164) persisting to their sophomore year compared with 90.5% (679) of all Black students and 91.0% (201) of all Hispanic students persisting to their sophomore year. Tables 2, 3 and 4 present descriptive statistics for the total sample analyzed in this study.
Table 2. Descriptive Statistics for the Sample

<table>
<thead>
<tr>
<th>Variables</th>
<th>Overall Sample</th>
<th>Pre-Collegiate Participants</th>
<th>Non-Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (%)</td>
<td>Std. Deviation</td>
<td>Mean (%)</td>
</tr>
<tr>
<td>FEMALE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>29.4%</td>
<td>19.4%</td>
<td>31.6%</td>
</tr>
<tr>
<td>Female</td>
<td>70.6%</td>
<td>80.6%</td>
<td>68.4%</td>
</tr>
<tr>
<td>MINORITY</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>15.8%</td>
<td>2.3%</td>
<td>18.4%</td>
</tr>
<tr>
<td>Black</td>
<td>62.7%</td>
<td>91.7%</td>
<td>56.2%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>18.5%</td>
<td>5.1%</td>
<td>21.4%</td>
</tr>
<tr>
<td>Other Ethnicity</td>
<td>3.0%</td>
<td>.9%</td>
<td>4.0%</td>
</tr>
<tr>
<td>PRE-COLLEGIATE PROGRAM PARTICIPATION</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAT SCORE</td>
<td>965.96</td>
<td>93.65</td>
<td>968.31</td>
</tr>
<tr>
<td>HIGH SCHOOL GPA</td>
<td>3.26</td>
<td>.4891</td>
<td>3.31</td>
</tr>
<tr>
<td>FINANCIAL AID</td>
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<td></td>
</tr>
<tr>
<td>Gift-Financial Aid</td>
<td>3810.52</td>
<td>1889.74</td>
<td>3944.24</td>
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<tr>
<td>Loans</td>
<td>1522.81</td>
<td>1068.57</td>
<td>1467.61</td>
</tr>
<tr>
<td>COLLEGE GPA</td>
<td>2.67</td>
<td>.6733</td>
<td>2.51</td>
</tr>
<tr>
<td>PERSISTENCE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Persisted</td>
<td>1077 (90.0%)</td>
<td>189 (87.1%)</td>
<td>888 (90.6%)</td>
</tr>
<tr>
<td>Failed to Persist</td>
<td>120 (10.0%)</td>
<td>28 (12.9%)</td>
<td>92 (9.4%)</td>
</tr>
</tbody>
</table>

Note: Total Sample (N=1,197); Pre-Collegiate Program Participants (N=217); Non-Participants (N=980)
Table 3. Cross Tabs of Academic Achievement Variable by Cohort Year and Pre-Collegiate Program Participation

| Cohort Year | Pre-Collegiate Participants | | | Non-Participants | | | |
| | ≥ 3.0 GPA | < 3.0 GPA | Total | ≥ 3.0 GPA | < 3.0 GPA | Total |
| | N | Percent | N | Percent | Total | N | Percent | N | Percent | Total |
| 2003 | 12 | 27.3% | 32 | 72.7% | 44 | 87 | 36.9% | 149 | 63.1% | 236 |
| 2004 | 9 | 20.9% | 34 | 79.1% | 43 | 67 | 27.4% | 178 | 72.6% | 245 |
| 2005 | 19 | 27.9% | 49 | 72.1% | 68 | 81 | 33.6% | 160 | 66.4% | 241 |
| 2006 | 20 | 32.3% | 42 | 67.7% | 62 | 97 | 37.6% | 161 | 62.4% | 258 |
| Total | 60 | 27.6% | 157 | 72.4% | 217 | 332 | 33.9% | 648 | 66.1% | 980 |

Table 4. Cross Tabs of Persistence Variable by Cohort Year and Pre-Collegiate Program Participation

| Cohort Year | Pre-Collegiate Participants | | | Non-Participants | | | |
| | Persisted | Failed to Persist | Total | Persisted | Failed to Persist | Total |
| | N | Percent | N | Percent | Total | N | Percent | N | Percent | Total |
| 2003 | 38 | 86.4% | 6 | 13.6% | 44 | 223 | 94.5% | 13 | 5.5% | 236 |
| 2004 | 38 | 88.4% | 5 | 11.6% | 43 | 220 | 89.8% | 25 | 10.2% | 245 |
| 2005 | 60 | 88.2% | 8 | 11.8% | 68 | 217 | 90.0% | 24 | 10.0% | 241 |
| 2006 | 53 | 85.4% | 9 | 14.6% | 62 | 228 | 88.4% | 30 | 11.6% | 258 |
| Total | 189 | 87.1% | 28 | 12.9% | 217 | 888 | 90.6% | 92 | 9.4% | 980 |
STATISTICAL ANALYSES RELATIVE TO RESEARCH QUESTIONS

A main objective of this study was to identify differences between pre-collegiate academic outreach program participants and non-participants in the areas of first-year financial aid attainment, academic achievement as measured by grade point average, and first-year persistence. This study posed three research questions pertaining to factors affecting the success of first time in college, first generation, low-income undergraduate students enrolled in a transitional Summer Bridge Program. Results of the statistical analyses will be presented, in order according to research question. Table 5 contains a description of the research questions, the statistical test used to analyze the data, and the independent and dependent variables used in the study.
Table 5. Summary of Statistical Analysis Used in the Study

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Statistical Analysis</th>
<th>Independent Variable(s)</th>
<th>Dependent Variable(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. 1: Are pre-collegiate participants awarded significantly larger gift financial aid packages than non-program participants?</td>
<td>Multiple Regression</td>
<td>1. Pre-collegiate program</td>
<td>Gift Financial Aid</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Female</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Minority</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. High School GPA</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. SAT Score</td>
<td></td>
</tr>
<tr>
<td>No. 2: Do pre-collegiate participants obtain significantly higher first-year GPA’s than non-program participants?</td>
<td>Multiple Regression</td>
<td>1. Pre-collegiate program</td>
<td>Academic Achievement</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Female</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Minority</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. High School GPA</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. SAT Score</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>6. Gift Financial Aid</td>
<td></td>
</tr>
<tr>
<td>No. 3: Do pre-collegiate participants persist at a significantly higher rate than non-program participants?</td>
<td>Logistic Regression</td>
<td>1. Pre-collegiate program</td>
<td>Persistence</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Female</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Minority</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. High School GPA</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. SAT Score</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>6. Gift Financial Aid</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>7. College GPA</td>
<td></td>
</tr>
</tbody>
</table>
Research Question #1

Are pre-collegiate participants awarded significantly larger financial aid packages than non-program participants?

Research question two examined if there were differences in financial aid awards between pre-collegiate program participants and non-program participants. St. John (1989) found that financial aid packages with grants were positively associated with year-to-year persistence of students enrolled in a four-year college and packages with loans were negatively associated with persistence between the first and second years of college. For the purposes of this study and the sample, it is important to note research shows low-income and minority students who receive grants generally are more likely to persist than those who receive loans (Swail, Redd, & Perna, 2003). As previously stated in Chapter Two, a major barrier to access and persistence is the lack of information for parents and students regarding grants, loans, and scholarship opportunities. Pre-collegiate academic outreach programs play a key role in proactively advising students and their families of the availability of financial aid opportunities and helping them navigate through the financial aid process maze.

In the multiple regression analysis, pre-collegiate program participation, female, minority, SAT score, and high school GPA were the predictor variables and gift financial aid award was the outcome variable. The multiple regression equation for predicting the outcome gift financial aid can be expressed as follows:

\[ Y = \beta_0 + B_1 X_{Pre-College} + B_2 X_{Female} + B_3 X_{Minority} + B_4 X_{High School GPA} + B_5 X_{SAT Score} \]

For this research question, the first step involved a multiple regression analysis using participation status in a pre-collegiate academic outreach program, female, minority, high school GPA, and SAT score as predictor variables and gift financial aid award as the criterion or outcome variable. The summary of this regression analysis can be found in Table 7.

Using the enter method, a significant model emerged \( (F_{5,1191} = 15.825, p < 0.05, \text{R Square} = 0.062, \text{Adjusted R square} = 0.058) \). The \( R^2 \) is a statistic that gives some information about the goodness of fit of a model. In regression, the \( R^2 \) coefficient measures how well the regression line approximates the real data points and can be interpreted as the proportion of variance in \( Y \) that is explained. An \( R^2 \) of 1.0 indicates that the regression line perfectly fits the data. In this model, the \( R^2 \) is very low and with \( R^2 = 0.058 \), meaning we have only explained about a 6% of the
variation in financial aid attainment with the Xs in the model. In this model, pre-college was far from being significant at .991 and only the race, high school GPA, and SAT score predictor variables were found to be significant. From these results, it does not appear that participation in a pre-collegiate academic outreach program affects the outcome of gift financial aid award. A summary of the descriptive statistics and the findings of the multiple regression analysis can be found in Tables 6 and 7.

*Table 6. Summary of Descriptive Statistics for Multiple Regression Analysis*

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Collegiate Program Participation (1=Y, 0=N)</td>
<td>.18</td>
<td>.385</td>
</tr>
<tr>
<td>Female (1=F, 0=M)</td>
<td>.71</td>
<td>.456</td>
</tr>
<tr>
<td>Minority</td>
<td>.8421</td>
<td>.36479</td>
</tr>
<tr>
<td>High School GPA</td>
<td>3.2556</td>
<td>.48918</td>
</tr>
<tr>
<td>SAT Score</td>
<td>966.68</td>
<td>91.492</td>
</tr>
<tr>
<td>Gift Financial Aid</td>
<td>3810.5</td>
<td>1889.75</td>
</tr>
<tr>
<td>College GPA</td>
<td>2.672</td>
<td>.6732</td>
</tr>
</tbody>
</table>

Note: Total Sample N= 1,197
Table 7. Summary of Regression Analysis for Variables Predicting Gift Financial Aid Award

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1(^a)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-Collegiate Participation (0=N, 1=Y)</td>
<td>.163</td>
<td>.142</td>
<td>.033</td>
<td>.249</td>
</tr>
<tr>
<td>Model 2(^b)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-Collegiate Participation (0=N, 1=Y)</td>
<td>-.002</td>
<td>.140</td>
<td>.000</td>
<td>.991</td>
</tr>
<tr>
<td>Female (0=Male, 1=Female)</td>
<td>.084</td>
<td>.122</td>
<td>.020</td>
<td>.493</td>
</tr>
<tr>
<td>Minority (0= White, 1= Minority)</td>
<td>.729</td>
<td>.148</td>
<td>.141*</td>
<td>.000</td>
</tr>
<tr>
<td>High School GPA</td>
<td>.687</td>
<td>.113</td>
<td>.178*</td>
<td>.000</td>
</tr>
<tr>
<td>SAT Score</td>
<td>.001</td>
<td>.001</td>
<td>.057*</td>
<td>.048</td>
</tr>
</tbody>
</table>

N=1,197; * Significant at 0.05 level
\(^a\) Predictors: (Constant), Pre-College; R\(^2\) = .001
\(^b\) Predictors: (Constant), Pre-College, Female, Minority, HS GPA, SAT Score; R\(^2\) = .062

Research Question #2

Do pre-collegiate participants obtain significantly higher first-year GPA’s than non-program participants?

As stated in the Chapter Three, multiple regression analysis was conducted to address research question number two. Multiple regression was appropriate due to the continuous dependent variable and the continuous and categorical independent variables. The multiple regression analysis focused on college GPAs as the dependent variable and included pre-collegiate program participation status, background variables, and gift financial aid in two separate steps, sequentially. The multiple regression equation for predicting the outcome college GPA can be expressed as follows:

\[ Y = \beta_0 + B_1X_{Pre-College} + B_2X_{Female} + B_3X_{Minority} + B_4X_{High School GPA} + B_5X_{SAT Score} + B_6X_{Gift Financial Aid} \]

Results of the analysis focusing on college GPA as the dependent variable with pre-collegiate program participation and gift financial aid as predictors showed a significant model (F\(_{6,1190}\) = 28.960, p < 0.05, R Square = .127, Adjusted R square = .123). In this model, pre-collegiate program participation, high school GPA, SAT score, and gift financial aid were all
significant. However, the regression coefficient for the pre-collegiate participation variable was negatively correlated at -.221 with college GPA. In statistics, the regression coefficient is the difference in response per unit difference in the predictor. In the model, college GPA was positively correlated with high school GPA, SAT score, and gift financial aid award. Specifically, college GPA increased .331 units for every one-unit increase in high school GPA; .001 units for every one-unit increase in SAT score; and .024 units for every one-unit increase in gift financial aid. College GPA appeared to be negatively correlated with pre-collegiate program participation and decreased .221 units for students who were participants in a pre-collegiate academic outreach program. The results of this sequential regression analysis can be interpreted to indicate that high school GPA, SAT score, and gift financial aid positively impacted college GPA while pre-collegiate program participation negatively influenced college GPA. A summary of this multiple regression analysis can be found in Table 8.

Table 8. Summary of Multiple Regression Analysis for Variables Predicting College GPA

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-Collegiate Participation (0=N, 1=Y)</td>
<td>-.208</td>
<td>.044</td>
<td>-.119*</td>
<td>.000</td>
</tr>
<tr>
<td>Gift Financial Aid</td>
<td>.046</td>
<td>.010</td>
<td>.129*</td>
<td>.000</td>
</tr>
<tr>
<td>Model 2&lt;sup&gt;b&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-Collegiate Participation (0=N, 1=Y)</td>
<td>-.221</td>
<td>.048</td>
<td>-.127*</td>
<td>.000</td>
</tr>
<tr>
<td>Female (0=Male, 1=Female)</td>
<td>.076</td>
<td>.042</td>
<td>.051</td>
<td>.071</td>
</tr>
<tr>
<td>Minority (0= White, 1= Minority)</td>
<td>-.020</td>
<td>.052</td>
<td>-.011</td>
<td>.699</td>
</tr>
<tr>
<td>High School GPA</td>
<td>.331</td>
<td>.039</td>
<td>.241*</td>
<td>.000</td>
</tr>
<tr>
<td>SAT Score</td>
<td>.001</td>
<td>.000</td>
<td>.169*</td>
<td>.000</td>
</tr>
<tr>
<td>Gift Financial Aid</td>
<td>.024</td>
<td>.010</td>
<td>.068*</td>
<td>.015</td>
</tr>
</tbody>
</table>

N=1,197; * Significant at 0.05 level
<sup>a</sup>Predictors: (Constant), Pre-Coll, Gift Financial Aid; R² = .028
<sup>b</sup>Predictors: (Constant), Pre-Coll, Female, Minority, HS GPA, SAT Score, Gift Financial Aid; R² = .127
Research Question #3

Do pre-collegiate participants persist at a significantly higher rate than non-program participants?

Binomial logistic regression analysis was conducted to address research question number three. Logistic regression was appropriate due to the dichotomous dependent variable and the continuous and categorical independent variables. The dependent variable, persistence, was measured at two levels at the beginning of the second year of enrollment. Students were categorized as persisters or non-persisters. The variables were entered in seven blocks: (Block 1) Pre-collegiate program participation; (Block 2) Female; (Block 3) Minority; (Block 4) High School GPA; (Block 5) SAT Score; (Block 6) Gift Financial Aid; and (Block 7) College GPA. Statistical significance was based on an alpha level of .05. The descriptive statistics revealed that 1077 (90.0%) of the total sample (N=1197) persisted. This figure breaks down to 189 (87.1%) of all pre-collegiate program participants (N=217) persisting and 888 (90.6%) of all non-program participants persisting (N=980).

The test of overall goodness of fit for a logistic regression model is the Hosmer and Lemeshow test, which is more robust than the traditional chi-square test for this statistical procedure. The Hosmer and Lemeshow test of overall goodness of fit for this logistic regression model revealed a Chi-square= 20.630 (8 df), p>.05. The non-significant chi-square is indicative of fit of data with the model.

The Omnibus Test of Model Coefficients represents the traditional chi-square test which tests if the model with the predictor variables is significantly different from the model with only the intercept or constant. In this analysis, the statistics for the Step, Block, and Model are different because stepwise logistic regression or blocking was used. The value given in the Significant column of the output is the probability of obtaining the chi-square statistic given that the null hypothesis is true. For this research question, the full model is statistically significant, chi-square = 91.434 (5 df), p < .05. The finding of significance indicates that at least one of the predictor variables is significantly related to the dependent variable of persistence.

The Cox & Snell R Square and Nagelkerke R Square are pseudo R-squares. Logistic regression does not have an equivalent to the R-squared that is found in OLS regression. The Cox & Snell R square and Nagelkerke R square are closely related statistics, and summarize how
much of the variability in the data are successfully explained by the model. Larger values of these R squares indicate that the model captures more of the data variability. However, since this statistic does not mean the same thing as in OLS regression, where the R-squared describes the proportion of the variance explained by the predictors, the researcher interpreted this statistic with caution. The proportion of variance in the dependent variable accounted for by the predictors was estimated to be between .074 for Cox & Snell R Square and .154 for Nagelkerke R Squared. The “Step” and “Block” R-squared tests tell us that the model was improved by the inclusion of these terms. As would be expected, the fit of the model improved, according to both of the R² calculations.

An examination of the classification table depicts how well the model predicted persistence or non-persistence. The table shows that the model did a better job of predicting the rate of persistence at a figure of 99.0% correct (1074 out of 1077) than at predicting non-persistence with a rate of 6.7% correct (8 out of 120).

The Beta coefficients in the logistic regression equation are the values for predicting the dependent variable from the independent variable and specify the amount of change in the logit with a one-unit change in the predictor, holding constant all other predictors. They are in log-odds units.

Similar to OLS regression, the equation when there are multiple predictor variables in a logistic regression model is

$$\log\left(\frac{p}{1-p}\right) = \beta_0 + \beta_1 * x_1 + \beta_2 * x_2 + \beta_3 * x_3 + \beta_4 * x_4 + \beta_5 * x_5 + \beta_6 * x_6 + \beta_7 * x_7$$

where p is the probability of persisting. Expressed in terms of the variables used in this study, the logistic regression equation is

$$\log\left(\frac{p}{1-p}\right) = -1.152 - .200 * \text{precollege} + .190 * \text{Female} + .471 * \text{Minority} - .047 * \text{HS GPA} + .000 * \text{SAT Score} + .035 * \text{Gift Financial Aid} + 1.275 * \text{College GPA}$$

These estimates tell us about the relationship between the independent variables and the dependent variable, where the dependent variable is on the logit scale. These estimates tell the amount of increase or decrease, if the sign of the coefficient is negative) in the predicted log odds of persistence=1 that would be predicted by a 1 unit increase or decrease in the predictor, holding all other predictors constant.

The Wald statistic is used to test the significance of individual logistic regression coefficients for each predictor variable. The p values indicate whether or not the predictor was
statistically significant, holding the other predictors constant. Exp (β) values are the odds ratios, which indicate by what amount the odds of persistence increase based on changes in the predictor variables. If Exp (β) value equal one, then the odds are unchanged; if greater than one, the odd increase, if less than one, the odds decrease.

For this model, only college GPA was significant with a p-value of .000. As a result, the null hypothesis that the coefficient equals 0 would be rejected. This means that controlling for all variables, college GPA was the only variable found to be statistically significant in predicting persistence beyond the first year of college. These statistical results mean that controlling all other variables, the odds of persisting increases by 1.275 times for every one-unit increase in college GPA. Pre-collegiate program participation status, race, gender, high school GPA, SAT score, and the amount of gift financial aid were not statistically significant and had no statistically significant net effect on persistence. Results of the logistic regression are summarized in Table 9.
| Block 1 | Pre-Collegiate Participation (0=N, 1=Y) | -.358 | .230 | 2.413 | .120 | .699 |
| Block 2 | Pre-Collegiate Participation (0=N, 1=Y) | -.401 | .232 | 2.979 | .084 | .670 |
| Female (0=Male, 1=Female) | .327 | .205 | 2.545 | .111 | 1.386 |
| Block 3 | Pre-Collegiate Participation (0=N, 1=Y) | -.485* | .239 | 4.134 | .042 | .616 |
| Female (0=Male, 1=Female) | .300 | .206 | 2.124 | .145 | 1.350 |
| Minority (0= White, 1= minority) | .449 | .248 | 3.278 | .070 | 1.567 |
| Block 4 | Pre-Collegiate Participation (0=N, 1=Y) | -.503* | .239 | 4.422 | .035 | .605 |
| Female (0=Male, 1=Female) | .222 | .209 | 1.132 | .287 | 1.249 |
| Minority (0= White, 1= minority) | .427 | .249 | 2.945 | .086 | 1.532 |
| High School GPA | .422* | .194 | 4.735 | .030 | 1.524 |
| Block 5 | Pre-Collegiate Participation (0=N, 1=Y) | -.497* | .239 | 4.312 | .038 | .608 |
| Female (0=Male, 1=Female) | .284 | .215 | 1.752 | .186 | 1.329 |
| Minority (0= White, 1= minority) | .443 | .249 | 3.155 | .076 | 1.557 |
| High School GPA | .382 | .197 | 3.775 | .052 | 1.465 |
| SAT Score | .001 | .001 | 1.495 | .221 | 1.001 |
| Block 6 | Pre-Collegiate Participation (0=N, 1=Y) | -.495* | .239 | 4.282 | .039 | .609 |
| Female (0=Male, 1=Female) | .281 | .215 | 1.710 | .191 | 1.325 |
| Minority (0= White, 1= minority) | .413 | .252 | 2.686 | .101 | 1.511 |
| High School GPA | .355 | .200 | 3.140 | .076 | 1.426 |
| SAT Score | .001 | .001 | 1.425 | .233 | 1.001 |
| Gift Financial Aid | .043 | .054 | .644 | .422 | 1.044 |
| Block 7 | Pre-Collegiate Participation (0=N, 1=Y) | -.200 | .255 | .615 | .433 | .819 |
| Female (0=Male, 1=Female) | .190 | .225 | .715 | .398 | 1.210 |
| Minority (0= White, 1= minority) | .471 | .264 | 3.199 | .074 | 1.602 |
| High School GPA | -.047 | .237 | .040 | .842 | .954 |
| SAT Score | .000 | .001 | .039 | .843 | 1.000 |
| Gift Financial Aid | .035 | .058 | .365 | .546 | 1.036 |
| College GPA | 1.275* | .150 | 71.941 | .000 | 3.580 |

N=1,197; * Significant at 0.05 level
SUMMARY

The purpose of this study was to determine if participation in a pre-collegiate academic outreach program in high school has an effect on first-year gift financial aid attainment, academic achievement as measure by college GPA, and persistence. Data from this study was analyzed using binomial logistic regression that measured the effect of program participation on first-year persistence and multiple regression to determine if program participants had significantly different first-year gift financial aid packages and college GPAs than non-program participants.

Analysis for the research question one regarding financial aid involved using multiple regression found that the pre-college participation variable was far from being significant at .991. Only the minority, SAT score, and high school GPA predictor variables were found to be significant. From these results, it does not appear that participation in a pre-collegiate academic outreach program affects the outcome of gift financial aid award.

For research question two, pre-collegiate program participation, high school GPA, SAT score, and gift financial aid were all significant. However, the regression coefficient for the pre-collegiate participation variable was negatively correlated at -.221 with college GPA. In the model, college GPA was positively correlated with high school GPA, SAT score, and gift financial aid award. Specifically, college GPA increased .331 units for every one-unit increase in high school GPA; .001 units for every one-unit increase in SAT score; and .024 units for every one-unit increase in gift financial aid. College GPA appeared to be negatively correlated with pre-collegiate program participation and decreased .221 units for students who were participants in a pre-collegiate academic outreach program. The results of this multiple regression analysis can be interpreted to indicate that high school GPA, SAT score, and gift financial aid positively impacted college GPA while pre-collegiate program participation negatively influenced college GPA.

Finally, when examining persistence, the logistic model showed that only college GPA was significant with a p-value of .000. This means that college GPA was the only variable found to be statistically significant in predicting persistence through the first year of college. These statistical results mean that controlling all other variables, the odds of persisting increased by 1.275 times for every one-unit increase in college GPA. Pre-collegiate program participation
status, race, gender, high school GPA, SAT score, and the amount of gift financial aid were not statistically significant and had no statistically significant net effect on persistence.
CHAPTER FIVE

CONCLUSIONS AND IMPLICATIONS

Pre-college preparation programs are geared toward increasing opportunities for students who have been historically underrepresented in postsecondary education (Tierney, 2004). These programs are specifically designed to increase and improve access through a multitude of activities and programs that include academic, social, and cultural components. Many programs also have formal interventions that attempt to address the needs of students’ families as part of the college-going process. Research on college preparation programs has identified major programmatic elements (Tierney, et. al.; Gándara, 2002; Swail & Perna, 2002a; 2002b; Gullatt & Jan, 2002). The programmatic elements noted below are a mix of academic enrichment opportunities with social and cultural activities that provide systemic knowledge about the culture of college and college life. These elements include:

1. individualized attention to students including tutoring and academic advising
2. access to mentors
3. positive peer integration
4. early preparation-beginning in middle school
5. socialization/cultural experiences
6. parental involvement
7. financial aid awareness and education
8. test preparation

The attention to increasing academic performance is in many ways the core goal of early invention programs. Along with program components, there are short-term and long term desired outcomes that are common across a number of programs (Tierney & Jun, 1998). In the short term, program participants are expected to have an awareness of their postsecondary options, improved study skills leading to higher GPAs, and increased knowledge of financial aid availability. An expected immediate result of these short term goals is increased student persistence and college attendance for program participants. Some long term goals include high school graduation, college completion, and self regulated learning (Tierney & Venegas, 2004).
DISCUSSION OF RESEARCH FINDINGS

Some previous studies on pre-college programs, primarily the Upward Bound Program or components of the program, have found a positive effect on students' academic achievement and performance; while others have found that these programs had no impact or a negative impact. Mathematica Policy Research Inc. that conducts the National Evaluation of Upward Bound, which began in 1992 and is still ongoing assessed the impact of the Upward Bound program on students’ preparation for college, college enrollment, persistence, and completion. Based on a representative sample of 67 Upward Bound programs, evaluators found little overall impact on academic readiness for college and no effect on postsecondary enrollment for students. Results of this study support the Mathematica study. By comparing the study’s treatment group to its control group, this study estimated the added effect of participating in a precollege program on financial aid attainment, academic achievement, and persistence. After controlling for student background characteristics, the main findings were:

1. Participation in a pre-college program had no significant detectable effect on the likelihood of receiving more gift financial aid for the first year of college when compared to non-participants from similar backgrounds.
2. Participants in pre-college programs have decreased odds of obtaining first-year cumulative college GPAs of 3.0 of higher when compared to non-participants from similar backgrounds.
3. Participation in a pre-college program had no significant detectable effect on the odds of persisting to the second year of college when compared to non-participants from similar backgrounds.

The researcher found no statistically significant difference between the research group and the control group when comparing first-year gift financial aid awards and persistence and a significantly negative effect on college GPA for students who were participants in a pre-college outreach program. Not surprisingly, findings of this study indicate that high school grades, SAT scores, and financial aid were a stronger predictor of college success than participation in a pre-collegiate outreach program. The findings of this study suggest weaknesses in the programmatic elements of pre-college outreach programs. Clearly, success at the postsecondary level is one of
the major objectives of pre-collegiate academic outreach programs and it is reasonable to expect the mean grade point average and rates of persistence of pre-college participants to be higher than their comparable, non-participating counterparts.

IMPLICATIONS FOR POLICY AND PRE-COLLEGIATE PROGRAMS

The researcher determined that participation in a pre-collegiate program in high school had no positive impact on financial aid attainment, college GPA, or first-year persistence. Greater efforts to increase access and postsecondary success for the neediest through enhanced interventions such as academic outreach programs do not necessarily translate into the development of cognitive factors (i.e., math enrichment, reading, writing skills, test-taking, standardized test preparation), which has legitimately been found to impact academic achievement at the postsecondary level (Gordon, 1999).

Although pre-collegiate academic outreach programs such as TRIO programs have demonstrated some success in supporting the postsecondary attainment of disadvantaged students, several challenges and implications for their programming practices remain. For example, TRIO programs target those students who have demonstrated the ability to succeed academically as well as meeting specific eligibility criteria. This may exclude a large population of disadvantaged students who could benefit from academic support and enrichment activities offered by these types of programs but for a number of reasons may not meet eligibility requirements. Second, most of these programs are offered at the secondary level when it is often too late to intervene with students in need of academic support or who are at risk of failure. Third, many precollege programs are poorly funded with minimal staff resources that limit their ability to serve a large target number of students and address the wide array of obstacles that impact student success. Finally, many of these programs are marginalized on the university campuses and school districts where they often operate in isolation, with little to no coordination of services or sharing of best practices.

To address the limitations of these academic outreach initiatives a multifaceted approach and systemic reform within school districts, higher education and the local community are essential to the enhancement of program services and increase the number of students served. In
addition, the early engagement of students as early as the 6th grade may improve high school and college completion rates (USDOE, 2000). The intentional and early integration of academic, social, and personal growth opportunities and programs may be an effective way to promote positive academic achievement outcomes and reduce the onset of problem behaviors experienced by many adolescents. Engaging and educating parents is another critical area for precollege programs. Research suggests that students’ high school completion and college enrollment rates are largely influenced by parent educational attainment (USDOE, 2000). Providing parents with information regarding high school course curriculums and sequencing, college going, and the financial aid process are all key program interventions.

By pooling resources and expertise, these college access programs, supported by the states, institutions, and school districts, can scale up their services and evaluation methods to become more effective providers to educationally and economically challenged students. Pre-college programs and the institutions and/or agencies that host them must continue to confront the challenge of boosting the academic performance outcomes of these students or risk seeing their programs defunded on a national level.

In sum, policymakers have focused for decades on increasing access to higher education by targeting disadvantaged middle and high school students. Some of the oldest and most researched access programs are GEAR UP, Talent Search, and Upward Bound. Cohort cost estimates range from $480,000 (Myers, et al, 2004) to $516,000- $677,000 and at more than a half-million dollars annually, the Upward Bound costs are equivalent to hiring nine full-time faculty at a four-year college for one year (Harris & Goldrick-Rab, 2010). Increasing access to higher education for disadvantaged students is a worthy goal, but continuing these programs may be questionable if there are other more cost-effective ways to reach that goal. The results of this study suggest a need to actively search for new and better ways to help disadvantaged students, and to study program costs and effects more carefully so that policymakers and college leaders can make more informed decisions.
FUTURE RESEARCH

Though the success of pre-college programs, most notably the Upward Bound Program, is well documented, less is known about the factors responsible for this success. The author believes that mixed-method and quasi-experimental investigation of pre-college programs are needed to measure the effectiveness of non-cognitive educational interventions at addressing academic achievement variables, such as academic self-efficacy, learning strategies, and ethnic identity (Caldwell & Siwatu, 2003). It is the researcher’s belief that these methods can be used as a context for interpreting qualitative results and serve as an aid in developing a rich and detailed understanding of the impacts of the more affective and intangible variables that impact postsecondary success. This type of research may identify promising practices and a diverse array of program components that could have an impact on academic preparation and college success.

The Department of Education did not give a high school "exit poll" to each student graduating from a pre-college program to ask them if they would have attended college anyway. Therefore, this study also does not offer the hard evidence to show that pre-college program participants who attended college would or would not have enrolled if the program did not exist and it does not provide evidence that these students would have had the tools to succeed without these support programs. The researcher believes that advantages such as knowing from which colleges to choose, to receiving tutoring support, to knowing how to fill out college & financial aid applications, understanding the SATs, and a host of other invaluable experiences that these programs provide are often hard to measure in strictly empirical studies. Swail (2004) uses a cost/benefit analysis to consider the impact of college preparation programs. With three case studies, he considers the value added of supplemental instruction programs, pre-school interventions, and broad school based interventions. He suggests four possible comparisons to assess the value of early intervention programs. These are the differences in the quality of information from program evaluation, the value of long term versus short term interventions, the assessment of tangible versus intangible outcomes, and finally, the differences between micro and macro-sized interventions.
A review of the literature offered in Chapter Two suggested that financial aid might play an integral part in college preparation. At the present, there is very little research that gauges the effectiveness of the financial aid component in college preparation programs because very few programs have incorporated financial aid into their programmatic structures (Tierney & Venegas, 2004). A 2004 report by Tierney and Venegas, identified a gap in the research related to what is not known about the ways in which early intervention programs address students’ understandings of college price, student aid, scholarships, and financial aid form preparation. They also noted that there is virtually no mention of how these programs might influence parental and familial understandings of financial aid. The authors suggested a research agenda that might be undertaken to determine the utility of having a financial aid component in college preparation programs. To date, very little research has been conducted with regard to financial aid and it is suggested as an area for further research.

In addition, this study did not examine if the experiences involved with participating in a pre-collegiate academic outreach program, contributed to a student’s academic and social integration. As Tinto (1975) discussed, academic and social integration influence college persistence and degree-completion behavior and the findings of this type of research could indicate a strong association between the pre-collegiate outreach program experiences of students and their college success. An understanding of educational success among first-generation students could be further enhanced by research on how time-varying factors, such as academic and social integration, financial aid amounts, or college GPA, would affect their college persistence by year. Another area of future research could compare the outcomes for students with relatively low levels of participation in pre-collegiate academic outreach programs to those of students with relatively high levels of program participation. For example, results may show that students who participate in pre-collegiate academic outreach programs for longer periods of time are more likely to have higher educational expectations than students who participate for shorter periods.

CONCLUSION

It is hard to measure indicators of success when the barriers themselves are hard to identify. In order to be seen as essential, pre-college programs must do a better job of assessing the effects of services and interventions using multiple indicators and then use these results to
modify pedagogies and practices within their programs. As important as it is to invest time, effort, money and human capital into student support services, it is equally important to develop assessment and evaluation measures (both quantitative and qualitative) that define and gauge the successful delivery of services. Programs must build upon what already exists and works well with their target students (Tierney & Jun, 1998). This will require identifying the strengths, interests, and needs of students and designing program strategies that respond to these identified areas. The implications of this study are important for educators, policy makers and administrators of programs who seek to serve economically and educationally disadvantaged students. Program administrators of pre-college programs should recognize that developing a successful program requires continued intentional effort over time, and that solving one problem usually creates two new ones.
APPENDIX A

HUMAN SUBJECTS APPROVAL LETTER

Office of the Vice President For Research
Human Subjects Committee
Tallahassee, Florida 32306-2742
(850) 644-8673, FAX (850) 644-4392

RE-APPROVAL MEMORANDUM

Date: 3/31/2011

To: Angela Coleman

Dept.: EDUCATIONAL FOUNDATIONS AND POLICY STUDIES

From: Thomas L. Jacobson, Chair

Re: Re-approval of Use of Human subjects in Research
What is the Effect of Pre-Collegiate Academic Outreach Programs on First-Year Financial Aid Attainment, Academic Achievement, and Persistence?

Your request to continue the research project listed above involving human subjects has been approved by the Human Subjects Committee. If your project has not been completed by 3/27/2012, you are must request renewed approval by the Committee.

If you submitted a proposed consent form with your renewal request, the approved stamped consent form is attached to this re-approval notice. Only the stamped version of the consent form may be used in recruiting of research subjects. You are reminded that any change in protocol for this project must be reviewed and approved by the Committee prior to implementation of the proposed change in the protocol. A protocol change/amendment form is required to be submitted for approval by the Committee. In addition, federal regulations require that the Principal Investigator promptly report in writing, any unanticipated problems or adverse events involving risks to research subjects or others.

By copy of this memorandum, the Chair of your department and/or your major professor are reminded of their responsibility for being informed concerning research projects involving human subjects in their department. They are advised to review the protocols as often as necessary to insure that the project is being conducted in compliance with our institution and with DHHS regulations.

HSC No. 2011.5963
REFERENCES


James, D. W., Jurich, S., & Estes, S. (2001). *Raising minority academic achievement: A compendium of education programs and practices*


BIOGRAPHICAL SKETCH

Angela Alvarado Coleman is a native New Yorker, and graduate of the University of Florida, where she received her B.S. degree in Exercise and Sport Sciences and Masters degree in Educational Leadership. Angela also obtained her doctoral degree in Higher Education from the Florida State University. Angela is currently the Senior Director of Student Support Programs at the City University of New York Kingsborough Community College in Brooklyn, NY. She has worked in the field of Student Affairs for over a decade primarily with student support programs and has over a decade of working with federal grants funded by the U.S. Department of Education. In her previous roles, Angela had the pleasure of working as the Upward Bound Project Director at both the Florida State University and Georgia State University. In her current position as Senior Director of Student Support, she is responsible for supervising seven departments within the Division of Student Affairs that include, Disability Services, the Child Development Center, the Men’s Resource Center, the Women’s Center, Veteran’s Affairs, the College Discovery Educational Opportunity Program, and the TRiO Student Support Services Program. In addition, Angela functions as a key member of the Dean of Student Affairs team and directly addresses overall student and faculty concerns.

Angela’s research interests focus on college access and success, educational finance, and higher education policy in an effort to encourage policymakers, educators, and the public to improve educational opportunities and outcomes for low-income, first-generation, and disabled college students. Angela has carried out research particularly on student retention and the impact of pre-collegiate academic outreach programs on financial aid attainment and student persistence.

Angela is a recipient of the Association for Institutional Research/National Center for Education Statistics’ Doctoral Fellowship, the National Summer Data Policy Institute Fellowship, and a Postdoctoral Policy Fellowship in Washington, DC. Today, Angela lives in Brooklyn, NY with her husband, Michael, and two sons, Christian Miguel and Michael Santo.