A Comparative Study of First-Generation and Continuing-Generation College Students at
a Single Four-Year Public University

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Dedication

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Abstract

Retention and graduation rates are measures of success for institutions of higher education. First-generation college students have been identified in the literature as being at-risk of attrition. This research compared first-generation and continuing-generation students at a medium-sized, public, four-year university to determine if and to what extent they differ in terms of pre-college traits, within college experiences and learning outcomes. First-generation college students were compared to continuing-generation students using a large database already in existence at the study institution. Over five thousand students responded to a variety of survey questions. Approximately twenty-four hundred first-generation college students were compared to approximately twenty-five hundred continuing generation college students on a variety of variables. Approximately fifty-three variables were used to compare first-generation to continuing-generation students. Terenzini et al.'s (1996) theoretical framework was used to identify variable dimensions for comparison such as pre-college characteristics, within college experiences, overall college satisfaction, and learning outcomes.

First-generation college students; entered the study institution with lower average ACT composite scores, came from families with lower household incomes, were less likely to participate in class, were less likely to get to know other students, worked more hours, spent fewer weekends on campus, had lower GPA's, and were less likely to be retained from first to second year. Findings at the study institution were similar to findings at other institutions studied in the literature.

In order for this institution to increase its retention and graduation rates it should consider developing retention programs aimed at first-generation college students.

Further qualitative analysis on the differences identified in this research will aid in the

design of the program for first-generation college students.

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Chapter 1

INTRODUCTION

First-generation status is a common characteristic of today's college students. "In 2004, 26 percent of all undergraduates enrolled in college in Minnesota were first-generation students. Nationally, 34 percent of all undergraduates were the first in their family to attend college" (Minnesota Office of Higher Education, 2006). Although first-generation students are attending college, they are attending at lower rates than their continuing-generation counterparts. Thirty-three percent of 1992 U.S. high school graduates had a parent with at least a bachelor's degree or higher, but 97% reported the intent to go to college (Choy, 2001). College attendance rates are strongly related to parents' education level; in 1999, 82% of continuing-generation students attended college right after high school compared to 54% of students whose parents completed high school but not college (Choy, 2001). In 1995 50.2% of first-generation college students started their education at a community college instead of a four-year university (Van T Bui, 2002). For the 1989-90 academic year, first-year first-generation students were twice as likely as first-year continuing-generation students to drop out before their second year of college (Choy, 2001).

The Problem

First-generation students enter college, attend selective institutions, and graduate at lower rates than their continuing-generation counterparts. Inman and Mayes (1999) and Riehl (1994) found consistent differences between first-generation and continuing-generation students' first-year retention rates in their research on single-institutions. First-generation students were 3% less likely to be retained for their second year of college than continuing-generation students. Although Penrose (2002) did not find significant

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differences in first-year retention rates among first-generation and continuing- generation students, she identified a widening gap in retention between first and continuing-generation students by the end of the third year of college. First-generation students enter college with a shared set of common characteristics: being less prepared academically, being an ethnic minority, being female, and coming from a lower socioeconomic class. Terenzini, Springer, Yaeger, Pascarella, and Nora (1996) hypothesized that these shared characteristics put first-generation students at a collective disadvantage and negatively impacts their college experience in and out of the classroom, which in turn impacts their learning outcomes, retention rates, and graduation rates. First-generation status has been used as an umbrella term for diverse populations who are under-represented in the U.S. higher education system. First-generation status alone does not disadvantage a student, but the shared characteristics listed above impact a student's experience before, during, and after college.

Historically disadvantaged populations need additional support to gain access to higher education and earn a degree. Providing this assistance based on race and gender would be controversial. Changing public policy and offering academic support programs and scholarships based on first-generation status encounters less conflict, while still accomplishing similar goals. Many government programs, such as TRIO, and single-institution initiatives such as academic support programs for at-risk students, have utilized first-generation status as well as ethnicity and income level as criteria for participation in order to reach the highest number of at-risk students. Including first-generation status as a criterion is not as limiting and discriminates less than using ethnicity and income level alone.

Weaknesses of Past Research

Research on first-generation students has been conducted regularly since the early 1980s using a variety of institution types, research methods, and statistical analysis techniques. Both national studies and single-institutional studies offer valuable insights. National studies describe and characterize the average first-generation student in the United States and compare them with the average continuing-generation student in the United States. National studies are unable to provide insight on the effects of a single-institution's initiatives and environment. National studies lack the descriptive details that a single-institution study can provide. Single-institution studies may be generalized to other institutions of similar size and scope. Statistical analysis has become more sophisticated since the 1980s.

Definition of Terms

The research literature inconsistently refers to non first-generation students as second generation students, traditional students, other students, and continuing-generation students. For the purpose of this research, these students will be referred to as continuing-generation students. According to TRIO grant program criteria, first-generation students are students whose parents have not graduated from college, but the research is somewhat inconsistent in what it means to be first-generation status. Some researchers define first-generation status to mean students whose parents have no college experience at all, and others define first-generation students as neither parent having a bachelor's degree (Billson & Terry, 1982).

Chapter 2

LITERATURE REVIEW

First-generation college student research is a relatively recent phenomenon that emerged as a separate body of knowledge in higher education research and practice in the 1980s. The research characterizes first-generation students and the changing climate of higher education today. Terenzini, Springer, Yaeger, Pascarella, and Nora's (1996) model of college impact is used in this review to characterize first-generation college students. The recent historical progression of first-generation college student research is illustrated by outlining when research was conducted, who conducted it, the methods used, and the major findings. Connections to aspects of Terenzini et al.'s (1996) model are used throughout the historical progression.

Conceptual Framework

Terenzini et al. (1996) developed a model of college impact based on theory conceptualized by Astin (1984), Pascarella (1985), Tinto (1975 and 1986), and Weidman (1989). This model of college impact describes the relationship among students' pre-college traits, institutional contexts like coursework, curriculum patterns, classroom experience, and out of class experience, and learning outcomes (See Figure 1). According to Terenzini et al. (1996), "the model hypotheses six sets of constructs defining a causal sequence that begins when students come to college" (p. 3). First-generation students come to college with similar background characteristics, and background characteristics influence the students' institutional context, which in turn impacts the educational outcomes (Terenzini et al., 1996).
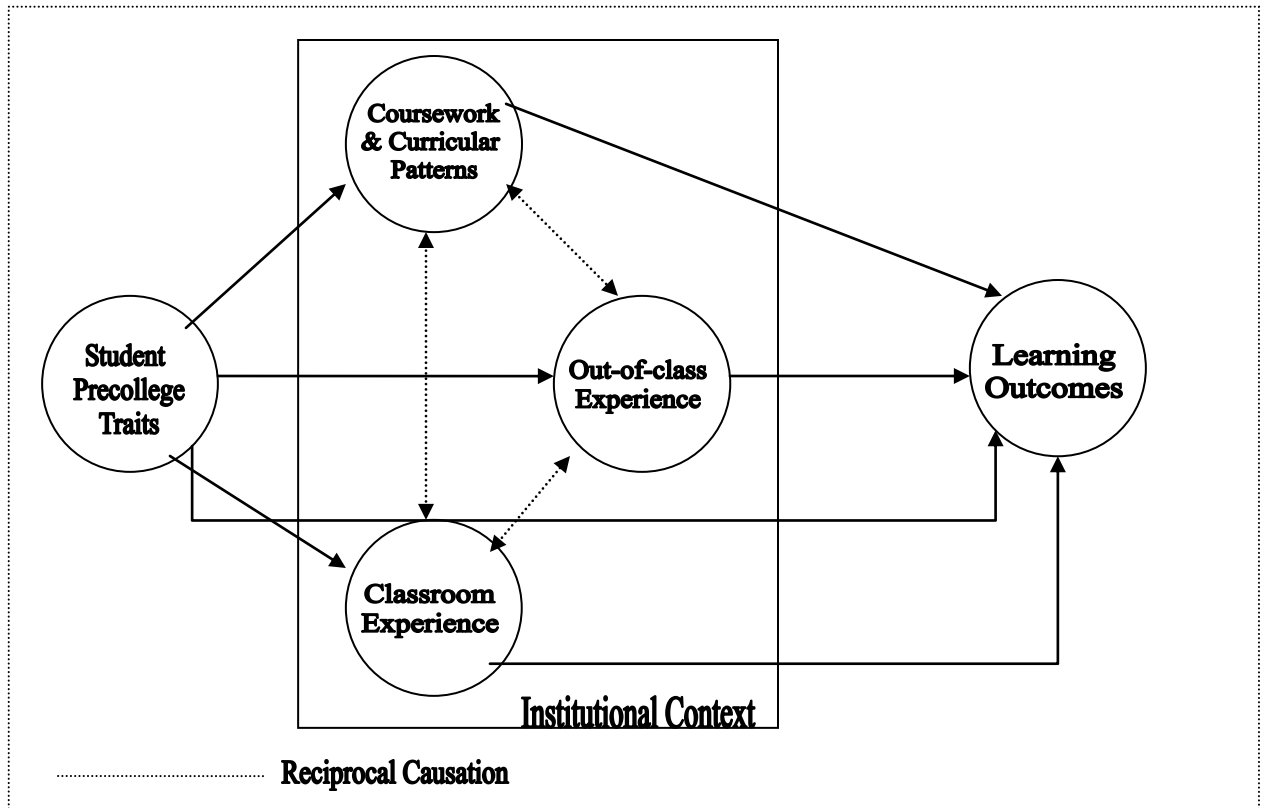
Figure 1 Conceptual Framework (reproduced from Terenzini et al., 1996).

Students' pre-college characteristics include demographics, academic preparation, personal self concept, family social environment, level of social integration, academic self concept, and their college-selection knowledge. The institutional context includes the following three factors: coursework and curriculum patterns (e.g., the number of credits completed and the kind of courses taken), out-of-class experiences (e.g., the number of hours spent working, studying, and socializing), and classroom experiences (e.g., class participation and perceptions of the faculty). Learning outcomes measure progress and/or success levels. Terenzini et al. (1996) used the Collegiate Assessment of Academic Proficiency, developed by ACT, as a pre and post assessment of learning outcomes. Other pertinent research literature includes many different

measures of learning outcomes and success levels, such as persistence and degree attainment.

The Terenzini et al. (1996) study is a three-year longitudinal national study using twenty-three different institutions, eighteen four-year and five two-.year colleges. These schools were selected purposefully to represent a cross section of different types of institutions across the country. Each school's sample size is proportionally representative of its population. Students in this study filled out a pre-college questionnaire about demographics and background, and they participated in a pre-college academic assessment in the fall of 1992. In the spring of 1993, the same students were asked to complete another academic assessment and a college experience questionnaire. Terenzini et al. used the results to assess differences between first-generation students and continuing-generation students which were salient in developing a revised retention model.

Terenzini et al. (1996) posed the following three research questions: "1. Do first-generation students' pre-college characteristics differ from those of traditional (i.e., not first-generation) students? 2. Do first-generation students' experiences during the first year of college differ from those of traditional students? 3. What are the consequences of any differences for students' cognitive development?" (p. 3). Ordinary least squares multiple regression analysis was used to compare data for first-generation and continuing-generation students. Terenzini et al. conceptualized that students' pre-college traits impact their within-college experiences and choices, which in turn impact their learning outcomes.

In terms of pre-college traits, Terenzini et al. (1996) found that first-generation students are more likely to be low income, Hispanic, female, older, and have dependent

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children. First-generation students also have lower initial critical thinking abilities, lower degree aspirations, report less encouragement from family to attend college, spend less time socializing with peers and talking to teachers in high school, expect to take more time to complete their degrees, and are more confident in their major choice. In terms of within-college experiences, they found first-generation students take fewer humanities and fine arts classes, complete fewer total credit hours during the first year, spend less time studying, are less likely to participate in honors programs, work more hours off campus, report less concern from faculty and less encouragement from friends, and are less likely to participate in racial/ethnic awareness workshops (Terenzini et al., 1996). In terms of learning outcomes, Terenzini et al. (1996) found no difference between first-generation and continuing-generation students on first-year gains in math and critical thinking abilities, but continuing-generation students did make significantly greater gains in reading comprehension. Terenzini et al. (1996) concluded that first-generation students enter college with different characteristics but first-generation students that actually persist, experience similar outcomes. The research literature supports aspects of Terenzini et al.'s (1996) model of college impact.

Pre-College Traits

Consistent with the Terenzini et al. (1996) model, the research on first-generation college students finds that first-generation college students enter college with significant disadvantages compared to their continuing-generation counterparts. Demographically, first-generation students are more likely to come from low-income families (Somers et al., 2000; Inman & Mayes, 1999; Bui, 2002), to be a racial minority and/or female (Inman & Mayes, 1999; Bui, 2002), be older (Somers et al., 2000; Inman & Mayes, 1999; Choy, 2001), and have more dependent children (Inman & Mayes, 1999).

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Academically, first-generation students are under-prepared. First-generation students are less likely to take rigorous high school curriculum (Simmons et al., 2005; Choy, 2001; Warburton et al., 2001; Horn & Nunez, 2000) and are less likely to take necessary college entrance exams like the ACT or SAT (Choy, 2001), which is a necessary part of the college-going pipeline. The lack of college selection knowledge contributes to first-generation students' failure to complete the activities of the college-going pipeline, such as researching different colleges, taking the ACT or SAT, applying to colleges, gaining admission, and applying for financial aid. First-generation students who take the ACT or SAT are more likely to score in the lowest quartile (Penrose, 2002; Riehl, 1994; Hahs-Vaughn, 2004; Bui, 2002). First-generation college students also have lower self esteem, lower degree aspirations (Terenzini et al., 1996), and less knowledge about the college selection process (Choy, 2001).

Institutional Context (Within College Experience)

Terenzini et al.'s (1996) model postulates that these pre-college traits will impact how the students interact with the institution. The research literature finds that first-generation students do experience college differently than continuing-generation students. In terms of coursework and curriculum patterns, first-generation students take fewer courses in the humanities and fine arts (Terenzini et al., 1996), complete fewer credit hours (Terenzini et al., 1996; Pascarella et al., 2004; Inman & Mayes, 1999), and are less likely to be retained and persist through graduation (Riehl, 1994; Inman & Mayes, 1999; Choy, 2001). Outside the classroom, first-generation students are more likely to work more hours (Terenzini et al., 1996; Pascarella et al., 2004; Billson & Terry, 1982), live off campus (Pascarella et al., 2004; Billson & Terry, 1982), and be less involved in campus organizations (Pascarella et al., 2004; Billson & Terry, 1982). The

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within-college experience includes financing education. Somers, Woodhouse, and Cofer (2004) studied the impact of cost and financial aid on first-generation and continuing-generation college students. First-generation students are more sensitive to cost increases and aid decreases than continuing-generation students. As costs increase and aid decreases, first-generation students are more likely to stop out of school because of cost than continuing-generation students (Somers et al., 2004). The research is not extensive on formal classroom experiences such as classroom participation and students' perceptions of the faculty.

<p align="center">Learning Outcomes and Success Levels</p>

Terenzini et al. (1996) hypothesized that students' experience in college will affect learning outcomes and success levels. The research literature discusses differences in learning outcomes for first-generation and continuing-generation students, but no common themes arise, due to the diversity of measuring procedures. However there are significant differences in success levels, (i.e., degree attainment and persistence.) Most researchers found inconsistent and/or insignificant differences in learning outcomes for first-generation and continuing-generation students. Although learning outcomes are difficult to define and measure, it is apparent that first-generation students who actually graduate from college, experience similar benefits as those achieved by continuing-generation students such as entry level careers and salaries (Choy, 2001).

The difference in persistence rates is still the most critical issue for first-generation students pursuing higher education. Researchers using a variety of methods have found that first-generation students are less likely to persist to degree attainment. Riehl (1994) conducted a single four-year university study and found that first-generation students were 3% less likely to continue onto their second year of college than

continuing-generation students. Inman and Mayes (1999) conducted a multi-campus community college study and also found that first-generation students were approximately 3% less likely to continue onto the second year than continuing-generation students. Penrose (2002) conducted a single four-year university study and found that over a three year college experience, first-generation students were more likely to withdraw or be suspended than continuing-generation students.

<div align="center">Historical Progression of the Research Literature</div>

The research literature on first-generation students has evolved over the last fifty to sixty years. Prior to the 1980s, parental education level was one of many attributes researchers considered when comparing student samples. In the 1980s, first-generation students started to emerge as a separate topic of research. Many researchers contributed to the emergence of first-generation college student research to the changing demographics of higher education (Terenzini et al., 1996; McGregor et al., 1991; Billson & Terry, 1982). Terenzini et al. (1996) argued that colleges and universities continue to become increasingly accessible to women, people of color, and students from low-income families, which in turn change the average college student profile.

The Higher Education Act of 1965 provided funding for federal TRIO programs to support first-generation college student success. Colleges also developed programs, independent of TRIO programs, to support their own first-generation college students. As the viability of these programs was scrutinized, continued federal funding and university funding required evaluative research on single-institutions to determine the effectiveness of initiatives such as TRIO and university academic support programs for first-generation students.

The research on first-generation college students has increased each decade since the 1970s in terms of volume, diversity of methods used, and sophistication of the statistical analysis. Although researchers do not universally cite Terenzini et al.'s (1996) model, most focus on all or part of the aspects of the model. The research has been conducted in several different environments, like single-institutions, multiple institutions and nationwide surveys, as well as community colleges and four-year universities. The research uses a variety of methodologies, from qualitative phenomelogical interviews to quantitative data-base queries. The next section will describe the historical progression of first-generation student research, including who has conducted the research, where the research was conducted, the methods used, the connection to Terenzini et al.'s (1996) model, and the major findings of the research as it has evolved over time.

Prior to the 1980s

Research prior to the 1980s was not specifically on first-generation status. Researchers explored college success factors and sometimes used parent education level as a variable. During this time period, available research was limited and statistical analysis methods did not control for multiple variables. Parent education level was not found to be the single best predictive factor of college success at this time.

One of the first research articles to mention parent education level was Emme's (1942) review, "Predicting College Success". Emme's review did not specifically explore the effects of first-generation status, although he included parent education level as one of the variables discussed in the literature. First-generation status was not found to be a predictive factor in college student success. Parents of this era were unlikely to be college graduates, so at this time parents' education level did not have a significant impact. Emme reviewed much of the college success research up to this point and determined that

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college grades are the best predictor of college success, and college grades are best predicted by high school grades. Although grades are the best predictor of success, Emme found evidence that success of college students depended on certain factors, including personal and social relationships of the student with their parents, and the degree to which home and school have prepared the student for independent living. The methodologies in the research Emme reviewed were not thoroughly explained but tended to be single-institution quantitative research. Although first-generation status was explored, it did not have a significant impact on college success at this time. First-generation status was not more thoroughly explored until the late 1970s.

Three decades later, Stanfiel (1973) used socio-economic status to compare aptitude, attrition, and achievement of college students. Although Stanfiel's research was not specifically focused on first-generation status, he defined socio-economic status by categorizing students by parent education level and parent income level. Stanfiel conducted his research using students at Howard University, a predominantly black university. Stanfiel classified 812 first-year students into three different parent education level groups: (1) parents had high school education or less, (2) parents had some college, and (3) parents had college degrees. Students were asked to complete a questionnaire with very specific information about parents' education level and income. Stanfiel compared SAT score and socio-economic status to determine any relationship. Stanfiel also compared SAT scores, socio-economic status, and achievement levels for white and black students to determine if the SAT scores and socio-economic status were equally predictive of academic success for black and white students. The largest difference between first-generation and continuing-generation students was the average SAT verbal

score. Achievement levels were not directly correlated with parent education level; groups 1 and 3 were more academically successful than group 2.

Research in the 1980s

Changing demographics, decreasing enrollment, and a focus on retention in higher education in the 1980s brought a research focus on first-generation student status. Three studies illustrate differences in pre-college traits and college experiences for first-generation and continuing-generation college students. Focusing on a pre-college trait, Conklin and Dailey (1981) explored the impact of parental educational encouragement on their student's college attendance. Focusing on the college experience, Billson and Terry (1982) explored the retention rates of first-generation students. Both of these studies used multiple regional institutions and quantitative statistical analysis. London (1989) focused on the pre-college trait of family background and the effect of family background on the college experience. London conducted in-depth, unstructured interviews with first-generation students to illustrate the impact of family roles and pressure on college attendance.

Conklin and Dailey (1981) explored the relationship between consistent parental educational encouragement and college entry, and the relationship between consistent parental educational encouragement and the type of college attended. They conducted longitudinal research in southern New York State by surveying the same students when they were in ninth, tenth, and twelfth grades. These same students were surveyed once again six months after high school graduation; a total of 1,734 students filled out the requested questionnaire all four times (i.e., ninth, tenth, twelfth and freshmen years). Students were asked whether or not it is taken for granted by their families that they will attend college. Six months after graduation, they were asked if and where they were

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attending college. Conklin and Dailey (1981) found that students who consistently reported that their own college attendance was taken for granted by their families were more likely to enroll in college than students who did not consistently report or did not report at all that their own college attendance was taken for granted by their families. Although inconsistent with other research, Conklin and Dailey (1981) found no relationship between socio-economic status and parental educational encouragement.

Billson and Terry (1982) compared student persisters and leavers based on first-generation and continuing-generation status in order to identify barriers first-generation students experience, and explored how barriers make first-generation students more vulnerable to attrition. They conducted their research at two institutions, a primarily residential private liberal arts college and a primarily commuter, state-supported, liberal arts college. Persisters and leavers were surveyed and some persisters also were interviewed. The measurement instrument is not specifically detailed in the research but its intent was to measure social integration, academic integration, support, college experience, satisfaction with college, and commitment to college. Chi-square analysis was used to compare these attributes for first-generation and continuing-generation college students and leavers and persisters.

Billson and Terry (1982) found no significant difference between first-generation and continuing-generation students' educational goals, such as career preparation, intellectual growth, and aspired level of education. However they did find a significant difference in their living experience. "First-generation students are much more likely to live off campus with their parents or with spouses while second-generation students are far more likely to live in residence halls" (Billson & Terry, 1982, p. 62). Billson and Terry (1982) also found that first-generation students are less involved on campus, less

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likely to have their best friends at school, and are more likely to work off campus than continuing-generation students. Therefore, Billson and Terry (1982) hypothesized that "second-generation students are much less likely to suffer from social isolation and the loneliness associated with it" (p. 63). Billson and Terry (1982) also measured the students' perceived support from home, and found that, the lower the parental education, the lower the perceived support (i.e., academic, financial, and emotional support).

London (1989) found that college attendance for first-generation college students is linked to family dynamics. London (1989) interviewed several Boston-area first-generation students and found themes of family role conflicts with college attendance. London's (1989) case study illustrates the additional challenges family dynamics put on first-generation students who are "breaking away" (p. 144) from family tradition and experiencing a "totally different world" (p. 146) while trying to maintain a connection to their family.

Although the first-generation college student research in the 1980s outlined here does not consistently find a causal link between parents' education level and students' college persistence, it illustrated that family background strongly impacts the decision to attend college and the college experience.

Research in the 1990s

In the 1990s, a majority of the first-generation college student research was conducted at institutions as opposed to national data-base studies. While there is not a great volume of national data-base research, the research and theory offered by Terenzini et al. (1996) using a national data-base contributed significantly to the body of knowledge. Although Grayson (1997) and Terenzini et al. (1996) are the only two 1990s

articles cited here that use the Terenzini et al. (1996) model, most of the research focuses on at least part of the model.

Single-institution Research

Research in Universities.

McGregor, Mayleben, Buzzanga, Davis, and Becker (1991) explored self perception of first-generation students using the Texas Social Behavior Inventory, the Unidimensional Short Form of the Taylor Manifest Anxiety Scale, and the Self Perception Profile for College Students for university students at a single-institution. The researchers combined all three measurements into one questionnaire and had student volunteers respond. McGregor et al. (1991) found that continuing-generation students perceived their adjustment to the demands of college as easier and more effective than first-generation students. First-generation students perceived themselves as less creative than continuing-generation students. Even though first-generation students perceived adapting to college to be more difficult, they felt just as capable of doing so as continuing-generation students. This kind of measuring of self perception is included in the pre-college traits part of Terenzini et al.'s (1996) model of college impact.

Riehl (1994) compared academic preparation, aspirations, and first-year performance of first-generation and continuing-generation first-year students at Indiana State University using a student information questionnaire consisting of 115 questions. These measures cover aspects in all three dimensions of Terenzini et al.'s (1996) model of college impact. Riehl (1994) determined that first-generation students were less academically prepared than continuing-generation students because they had lower average SAT scores and lower average high school grades. First-generation students were also determined to have lower aspirations due to lower college grade-point-average

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expectations and lower degree aspirations. First-generation students also had lower first year persistence rates. Ten percent of first-generation college students dropped out of college during the first semester, compared to six percent of continuing-generation students. Sixty-five percent of first-generation students returned to school for the second year, compared to 71% of continuing-generation students.

Riehl (1994) concluded that first-generation students may be more successful if Indiana State University provided separate programming for first-generation students, their parents, and faculty members. Riehl suggested that first-generation students need programs that will promote their social and academic integration; their parents need to be aware of the support they can and should provide and faculty need to understand the unique challenges first-generation students face. The university could also set up an early warning system for students who start to miss classes and perform poorly in the classroom (Riehl, 1994).

Grayson (1997) applied Terenzini et al.'s (1996) model of college impact to York University in Ontario Canada. Grayson surveyed the 5,500 first-year full-time students (receiving responses from 1,849) at York and obtained their high school and college academic records from the administrative records. Grayson found that first-generation students had slightly lower high school and first-year college grades than continuing-generation students. First-generation students were also less likely to be involved on campus. High school grades are a measure of pre-college traits, while college grades and involvement are a measure of college experience. Grayson (1997) used grades to measure success levels, but did not report statistics for persistence and degree attainment. Based on Emme's (1942) research on predicting college success, it can be inferred that first-generation students may be less likely to graduate due to lower grades.

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R*esearch in Community Colleges.*

York-Anderson and Bowman (1991) compared college knowledge and family support of first-generation and continuing-generation students by surveying first-year community college students at a single college. The research fits into the pre-college traits part of Terenzini et al.'s (1996) model of college impact. Their research found little difference between first-generation and continuing-generation students in the "amount of college knowledge, personal commitment to college, and perceived family pressure for college attendance" (1991, p. 119). However, York-Anderson and Bowman (1991) did find continuing-generation students perceived significantly greater family support for college attendance. Students who perceived more family support also scored higher on the college knowledge assessment. York-Anderson and Bowman (1991) concluded, "first-generation college students' education paths may be more misguided because they may have less knowledge of or fewer experiences with college-related activities, skills, and role models than do second-generation college students" (p. 120).

Brown and Burkhardt (1999) surveyed first-year students at a large urban community college in southern California to determine the impact of ethnicity, income, and parent educational level on student success. They used the annual student survey developed by the institution. The purpose of the annual student survey is to measure students' use and satisfaction level with student services and instruction. The survey asked students about parent education level and income. They also obtained data from the student records data-base. Brown and Burkhardt used chi-square analyses and t-tests to compare variables for first-generation and continuing-generation students. The chi-square and t-test analysis were not sophisticated enough to determine the net effect of first-generation status. Brown and Burkhardt also conducted logistic regression analysis

to control for independent variables like income, ethnicity, high school grade point average, and primary language. Brown and Burkhardt were the only researchers to acknowledge that both native and non-native born students can be considered first-generation students.

Brown and Burkhardt (1999) found that first-generation students and continuing-generation students differed dramatically on pre-college background and demographic traits, but that first-generation status did not specifically impact student success rates. Traits associated with first-generation status like low income, less college knowledge, and lower levels of social integration negatively impacted student success. Although first-generation status does not directly cause poor performance in college, students classified as first-generation status share common characteristics that do put them at risk of not finishing college. First-generation students tend to be low income, racial minorities, female, and older.

Multi-Institution Research

Braxton, Sullivan, and Johnson (1997) conducted a review of 10 peer-reviewed, research studies that utilized Tinto's (1986) retention model as a theoretical framework. Tinto's interactionalist theory is very similar to Terenzini et al.'s (1996) model of college impact. Tinto postulated that students enter college with various individual characteristics and those characteristics directly impact their decision to leave college, their initial commitment to college, and the goal of graduation. The research reviewed in this study was conducted at single-institutions as well as multiple institutions and tested 15 propositions derived from Tinto's model. Braxton et al. (1997) found moderate to strong support for the propositions that students' entry characteristics, like parental education level, affect a student's level of commitment to the institution and the goal of graduation.

Inman and Mayes (1999) surveyed a large sample (N=5,057) of community college students in Kentucky to determine if first-generation community college students are different from other community college students, in what ways, and to what extent. Inman and Mayes (1999) found that demographically, first-generation students in the Kentucky community college system are more likely to be female, older, have more dependent children, be low income, and work more.

In terms of goals and motivation, Inman and Mayes (1999) found first-generation students need a college close to home and need night courses more than continuing-generation students. Inman and Mayes hypothesized that first-generation students face unique geographic and financial constraints not experienced by continuing-generation students. First-generation students are more concerned with learning certain knowledge than continuing-generation students; they value the reputation of the college for good teaching more than continuing-generation students. First-generation students wanted to increase self-confidence, whereas continuing-generation students wanted to improve their academic record in order to transfer. First-generation students in this study were more likely to have a two-year degree as their ultimate academic goal, were less likely to transfer to a state university, completed fewer credits, and were less likely to persist to graduation.

Research in the 2000s

In the first decade of the new millennium, first-generation college student research became more sophisticated relative to statistical analysis methods. Researchers analyzed a variety of different national data-bases seeking to answer quite diverse research questions. Single-institution research was also conducted in the 2000s and

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explored aspects of Terezini et al.'s (1996) model with more sophisticated statistical analysis and more specific research questions.

R*esearch Using National Data-bases*

In 2000 and 2001, the National Center for Education Statistics published three reports focused on the plight of first-generation college students. Horn and Nunez's (2000) research outlined the differences in high school math curriculum for first-generation and continuing-generation students. Choy (2001) found that first-generation students are less likely to go to college and outlined reasons why. Horn and Nunez (2000) and Choy (2001) focused on the pre-college traits part of Terenzini et al.'s (1996) model, while Warburton et al. (2001) explored pre-college traits and outcomes. Warburton et al. (2001) compared first-generation students' college grade point averages, remedial course taking patterns and persistence nationwide with continuing-generation students.

Horn and Nunez (2000) analyzed data from the National Education Longitudinal Study (NELS 88/94). They found that taking advanced math in high school dramatically improves access to and success in college for all students. Taking advanced math in high school starts with taking Algebra in eighth grade. Even when controlling for academic preparation and other family background characteristics, first-generation students were less likely to take advanced math in high school, starting with Algebra in eighth grade. This study found that parents, college educated or not, have considerable influence over students' high school curriculum choices. The parents of first-generation students could help their students select a rigorous high school math curriculum if they understood the importance of it.

Choy (2001) also used data from the National Education Longitudinal Study 1988-1994, and included data from the Beginning Post-Secondary Students Longitudinal

Survey and the Baccalaureate and Beyond longitudinal survey. Choy (2001) suggested that enrolling in college requires students to go through a pipeline of activities that starts years prior to college enrollment, such as deciding to pursue higher education, taking a rigorous college preparation curriculum in high school, taking the ACT or SAT, and applying for admission and financial aid. For 1992 high school graduates, parent education level is strongly correlated with the completion levels of each one of these activities. The less education a student's parents have, the less likely they are to complete each step in the college going pipeline.

Choy (2001) also explored first-year performance, persistence, and degree attainment. First-generation students were more likely to have poor first-year grades and are more likely to drop out of four-year schools than continuing-generation students. First-generation students who took a rigorous high school curriculum improved their odds of success and persistence. Although first-generation students who do graduate from college experience very similar occupations and salaries as continuing-generation students right after graduation, first-generation students are much less likely to go on to graduate school.

Warburton et al. (2001) compared the high school performance and post-secondary persistence of first-generation students and continuing-generation students and their findings are consistent with research conducted by Horn and Nunez (2000) and Choy (2001). They categorized the rigor of high school curriculum into four levels: core new basics and below, beyond new basics I, beyond new basics II, and rigorous and found strong correlation between parent education level and high school rigor and college persistence. Students whose parents have at least a bachelor's degree are more likely to

take a rigorous high school curriculum. Students who took a rigorous high school curriculum are more likely to persist to degree attainment.

Hahs-Vaughn (2004), Duggan (2004), Somers et al. (2004), Pascarella et al. (2004), and Pike and Kuh (2005) utilized national data-bases to identify national first-generation student phenomenon, but their studies did not result in NCES reports. Hahs-Vaughn (2004), using the Beginning Post-Secondary Students Longitudinal Study 90/92/94 and a modified version of Terenzini et al.'s (1996) model of college impact, analyzed the data via structural equation modeling. Hahs-Vaughn (2004) set out to determine if pre-college, during college and after college experiences are different for first-generation students than continuing-generation students. Based on the theoretical model, Hahs-Vaughn assessed the impact of parents' education at three points in a student's academic career, pre-college, during college, and after college. Hahs-Vaughn found that first-generation and continuing-generation students differed significantly on the expected highest level of education, entrance exam score, non-academic experiences, and aspirations for education variables. Structural equation modeling was used to test this model in order to study more than one sample of data simultaneously.

Duggan (2004) tried to uncover the reasons why first-generation students are less likely to attain a degree. Duggan states that there are four types of capital that can impact a students' educational attainment: financial, human, cultural, and social. E-mail is a type of social capital that can help students connect to campus and stay in touch with home at the same time. E-mail as social capital would fit into the institutional context, out of classroom experience part of Terenzini et al.'s (1996) model. Duggan used the Beginning Post-Secondary Students Longitudinal survey 1996/1998 and found that all students with E-mail accounts are more likely to persist than students without E-mail. According to this

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1996/1998 data continuing-generation students are much more likely to have an E-mail account than first-generation students. First-generation students who used E-mail were more likely to persist in school than first-generation students who did not use E-mail.

Financial aid is also part of the institutional context and out-of-classroom experience is also part of Terenzini et al.'s (1996) model. Somers, Woodhouse, and Cofer (2004) outlined the serious threat decreased grant funding causes first-generation students. Federal financial aid has been shifting from grant aid to loan aid. Somers et al. (2004) set out to explore how background, aspirations, achievement, and college experiences affect within-year persistence of first-generation students as compared to continuing-generation students. This research question is similar to the past research conducted on first-generation students and is focused on all three aspects of Terenzini et al.'s (1996) model. But Somers et al. (2004) also asked the question, how does financial aid and price affect within-year persistence of first-generation and continuing-generation students. The exploration of price and financial aid makes their research unique.

Somers et al. (2004) used data from the National Post-Secondary Student Aid Study 1995-96. Many of Somers et al.'s findings are consistent with the literature. First-generation students over the age of 30 were less likely to persist than first-generation students ages 22-30. Low-income first-generation students were less likely to persist than middle income first-generation students. First-generation students aspiring to advanced degrees were more likely to persist than first-generation students with lower degree aspirations. First-generation students living on campus were more likely to persist than first-generation students living off campus and students who work full time were less likely to persist.

Somers et al.'s (2004) research question exploring the effect of price and financial aid contributes unique findings to the literature. The receipt of financial aid has a positive effect on persistence for both first-generation and continuing-generation students. The increase in price has a negative effect on persistence for both first-generation and continuing-generation students. Although first-generation and continuing-generation students respond in similar ways to price and financial aid, the effect size for first-generation students is significantly larger. As price and loan aid increase and grant aid decreases, first-generation students are much more likely to drop out of school than continuing-generation students (Somers et al., p. 427).

Pascarella, Pierson, Wolniak, and Terenzini (2004) used the National Study of Student Learning 1992-95 to "assess the net effects of being a first-generation student, not only on status attainment oriented outcomes, but also on learning, cognitive development, and psychosocial dimensions" (Pascarella et al., 2004, p. 255). Their theoretical framework is very similar to Terenzini et al.'s (1996) model of college impact. The data was analyzed in three stages, using ordinary least squares regression analysis and simple correlation.

Pascarella et al. (2004) found that even when controlling for academic preparedness, degree plans, parent income, and other tested variables a net effect of first-generation status is the tendency to enroll in less selective institutions than continuing-generation students. This finding raises concern about differences in access to higher education for first-generation students. Additional net effects of first-generation status include: completion of significantly fewer credit hours, work significantly more hours, significantly less likely to live on campus, lower grades, less involvement on campus,

lower levels of science reasoning and learning for self-understanding, and significantly smaller increases in highest degree planned to obtain.

Pascarella et al. (2004) also found conditional effects of first-generation status. Positive college experiences had a larger positive effect for first-generation students compared to continuing-generation students with the same experiences. "Extracurricular involvement had stronger positive effects on critical thinking, degree plans, sense of control over their own academic success and preference for higher order cognitive tasks for first-generation students than for other students" (Pascarella et al., 2004, p. 278). Pascarella et al. (2004) concluded "first-generation students derived greater outcome benefits from extracurricular involvement and peer interaction than other students even though they were less likely to be engaged in these activities during college" (p. 278.) Pascarella et al.'s (2004) findings support the need for programs that will increase student involvement levels for first-generation students.

Pike and Kuh (2005) used multi-group structural equation modeling to analyze data from the College Student Experience Questionnaire, a nationwide data-base. They intended to answer the following research questions: "1. Are the relationships among background characteristics, engagement, and learning and intellectual development the same for first and second generation students? 2. Do first and second generation college students differ in terms of their background, levels of engagement during college, and reported gains in learning and intellectual development? 3. Are differences between first and second generation students directly related to first-generation status or are they an indirect result of associations between first-generation status and antecedent characteristics or experiences?" (Pike & Kuh, 2005 p. 278).

Pike and Kuh (2005) concluded that first-generation status has an indirect effect on college success. Low levels of social and academic engagement can be more directly attributable to lower education aspirations and living off campus. However Pike and Kuh (2005) also stated that additional research is needed to understand causal connections for academic success of first-generation students, and although research using national data sets is more generalizable, it obscures the impact of single-institution interventions on behalf of first-generation students. Evaluative studies of interventions targeting access, retention, and graduation rates of first-generation students will be discussed later.

National research is very valuable research in the 2000s, but single-institution research can be more generalizable to other institutions of similar size and mission. Single-institution research focuses specifically on unique aspects and initiatives of single-institutions that national data-base research cannot illustrate.

Research Using a Single-institution

Penrose (2002) compared academic literacy for first-generation and continuing-generation students at North Carolina State University. In accordance with Terenzini et al.'s (1996) model, Penrose intended to determine if first-generation students differed in background and academic preparedness, and if they succeeded in college at equal rates and in similar academic areas as continuing-generation students. Penrose's unique research design included the intent to measure and compare students' confidence in their ability to handle the literacy demands of college, such as communicating verbally and orally.

In terms of pre-college traits, Penrose found that first-generation students tended to be lower income, planned to work more in college, were more likely to be racial minorities, and were less prepared academically. First-generation and continuing-

generation students' educational goals tended to be similar, including to prepare for a good job, to understand their own abilities and interests, and to value racial equity. But first-generation students rated learning to value arts, music, and literature significantly lower than continuing-generation students. This finding is consistent with the Terenzini et al. (1996) finding that first-generation students take fewer courses in the humanities and fine arts than continuing-generation students. No significant differences were found in perceived math or science abilities, but first-generation students rated themselves lower on verbal skills like communicating ideas orally and communicating ideas in writing. This finding is also consistent with the Terenzini et al. (1996) finding of no difference in math and critical thinking development between first-generation and continuing-generation students, but significantly higher development in reading comprehension among continuing-generation students.

In terms of persistence, Penrose (2002) found no difference in attrition rates at the end of the first year, but over three years, first-generation students were more likely to withdraw or get suspended than continuing-generation students. In terms of college experience, Penrose found that first-generation students also reported lower levels of development of their ability to cope with change and plan and carry out projects independently. Penrose concluded that first-generation students at North Carolina State "pay higher costs than other students to succeed in college" (2002, p. 454). They were less academically prepared with fewer academic and financial resources to draw upon.

Bui (2002) conducted a single-institution study at UCLA to compare first-generation with continuing-generation students' background characteristics, reasons for pursuing higher education, and first-year experiences. Bui's background characteristics findings are consistent with previous studies at other institutions. First-generation

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students at UCLA are more likely to be a racial minority, to be low income, and to have lower SAT scores than continuing-generation students. First-generation students at UCLA were also more likely to speak a language other than English at home. Bui (2002) found similarities between first-generation and continuing-generation students' reasons for pursuing higher education (e.g., parents expected them to go, teachers and counselors encouraged them to go, and they wanted to achieve career goals that require a degree.) First-generation and continuing-generation students differed in the ranking of their reasons to pursue higher education. First-generation students ranked "gaining respect/status", "bringing honor to their family", and "helping the family financially after college" significantly higher in reasons for pursuing higher education than other UCLA students. First-generation students' first-year experiences differed from continuing-generation students due to the fears of first-generation students, like fears of failing and worries about financial aid (Bui, 2002, p. 9).

Dennis, Phinney, and Chuateco (2005) focused on ethnic minority first-generation students, viewing interaction between the student and their immediate environment as predictors of success. They specifically explored how motivations to attend college and social support from family and peers influence college outcomes. The research was conducted at a diverse, urban, commuter university on the West Coast and included 100 minority students using a longitudinal survey and the student records data-base. Dennis et al. (2005) concluded from their findings that first-generation ethnic minority students "perceive their peers as better able than their family to provide the support they needed in order to do well at college" (p. 234). They also found that these students' personal motivations were a better predictor of college adjustment than family pressures.

Research Using a Multi-Institution- Single System

Simmons, Musoba, and Chung (2005) researched first-generation college students, at public and private colleges in the state of Indiana. Participants were new entering, full-time freshmen in the Fall of 2000. Consistent with past research, Simmons et al. (2005) explored background characteristics, pre-college preparation, and college experiences of persisters and leavers to compare first-generation and continuing-generation student persistence rates.

Simmons et al. (2005) found that students from high-income families were more likely to persist than students from low and middle income families. Asian students were more likely to persist than white students. Students with higher high school grades as well as students who completed a rigorous high school curriculum were more likely to persist than those that did not get high grades or complete rigorous high school curriculum. These findings are similar for first-generation and continuing-generation students.

Simmons et al. (2005), like Pascarella et al. (2004), found stronger coefficients for first-generation students and hypothesized that "first-generation students experience the university scene more intensely than other students" (Simmons et al., 2005, p. 18). They also found that first-generation students earning 'A' grades are more likely to persist than first-generation students earning 'B' grades or less.

Characteristics/Phenomenon Common for First-generation College Students

While single-institution research can reveal unique details about a single school, qualitative research reveals unique details about individual students. Rodriguez (2003) published research on the common phenomenon that encourage first-generation students to succeed and go on to help other first-generation students succeed. Rodriguez

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conducted in depth interviews with first-generation student graduates from poor, under-educated backgrounds who are now activists for other first-generation students. Rodriguez (2003) identified common factors that may have helped them succeed. Participants for this study were contacted based on recommendations Rodriguez obtained from community activist organizations for individuals that met her criteria.

Rodriguez (2003) identified three unique phenomena that, in addition to traditional academic support like financial aid, academic preparedness, and college counseling, were significant in the experiences of first-generation students' success. Rodriguez calls these three phenomena; "special status", "positive naming", and "ascending cross-class identification". Rodriguez defined these phenomenon as follows: "special status is an academic success promoting influence often granted by an uneducated family member…participants are singled out, in a positive way, even as young children, with advantageous effects on their self confidence and on their willingness to take informed risks" (2003, p. 19), "positive naming occurred in most participants lives when someone who cared about them or knew them well helped them develop their potential" (2003, p. 19), and "ascending cross-class identification occurs when a person from a lower socio-economic class gains deep understanding of what life is like in a higher class" (2003, p. 21).

Byrd and MacDonald (2005) conducted eight in-depth phenomenological interviews with non-traditional, first-generation, transfer students. They discovered what these particular students think it means to be ready for college, what skills are necessary for college success, and how they see themselves. In order to be ready for college these participants "indicated that (a) skills in time management, (b) the ability to apply oneself and focus on a goal and (c) skills in advocating for oneself as a learner are essential"

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(Byrd & MacDonald, 2005, p. 28). These students were driven to succeed by their background characteristics, they wanted to do better than their parents and set positive examples for their own children. Most of these students saw being older as a benefit. They felt "being older strengthened (a) self concept, (b) self advocacy, (c) goal focus, and (d) time management skills" (Byrd & MacDonald, 2005, p. 28). Since these are the same factors these students sited as essential for college readiness they perceive themselves as ready for college success. These feelings may not be unique to all first-generation students, but they are the common feelings these particular first-generation, older, transfer students share.

<div align="center">Programs to Assist First-generation College Students</div>

Some colleges and universities have been intervening with first-generation students to promote success. The first-generation college student experience is more stressful than the continuing-generation students' experience. For example, Simmons et al. (2005), Penrose (2002), Billson and Terry (1982), and Somers et al. (2004) all concluded that first-generations students are on a thin edge. These students lack the support to succeed on their own, but if assisted they can excel. Billson and Terry (1982) stated this phenomenon most plainly in their conclusion, "we have seen the search for the silken purse, although a meaningful one for first-generation students is made more difficult by the fact that they are making a longer jump from the social status of their parents than are second-generation students. And they are making that jump with fewer resources and less support and positive role modeling from significant others" (Billson & Terry, 1982, p.74).

The lack of parental support for first-generation students is an increasing problem as the millennial continuing-generation students enter college with "helicopter parents".

The term helicopter parents is a very recent phenomenon in education and categorizes the parents that continually "hover" over their child to guide them through the college experience, such as course taking habits, navigating student services, and handling roommate complaints. Helicopter parents strongly advocate for their child to the institution if the child has any problems. Because the parents of first-generation students have not experienced college, they are unfamiliar with the processes and tend not to intervene to the same extent as continuing-generation students' parents.

Colleges and universities recognize the need to intervene with first-generation students to promote access, retention, and graduation. The schools that create intervention programs must continually evaluate the program's effectiveness for continued support and improvement. Colleges and universities tend to begin intervention programs specifically focusing on minority and low-income students and then include first-generation college students in their criteria to ensure they will be helping a diverse population of needy students. As discussed earlier, the term first-generation students is often used to encompass a variety of at-risk groups such as students of color, older students, and low-income students.

Federally funded interventions include all seven TRIO programs: Upward Bound, Upward Bound Math and Science, Educational Talent Search, Ronald E. McNair Post-baccalaureate Achievement, Student Support Services, Educational Opportunity Centers, and TRIO dissemination partnership programs. Student Support Services is commonly found in institutions of higher education and the program criteria are low-income, first-generation students and students with disabilities evidencing need for assistance (www.ed.gov/programs/triostudsupp/eligibility.html 07/29/06) . Institutionally funded interventions are also present within high schools and colleges, and include high

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school counselor initiatives and student services for first-generations students. Pike and Kuh (2005) noted that more single-institution program evaluations must be conducted to determine the effectiveness of programs that aim to increase access, retention, and graduation rates for first-generation students. Kezar (2001) notes that national research on early intervention programs at the high school and middle school level is limited due to lack of funding, small programs, and vast diversity in program format. Pertinent literature on first-generation college students includes this limited research conducted to evaluate programs that intend to improve college access, retention, and graduation rates for first-generation students.

Educational TRIO Programs

The effectiveness of TRIO programs has been debated by politicians, supporters, and opponents. President Bush accused TRIO of being ineffective, whereas Clarence Smith, former Upward Bound Director at Rust College Holly Springs MS, argued that Bush's claim is based on faulty data. Smith supports the efforts of TRIO and states that, "the current level of funding allows less than 7 percent of the eligible population to be served" (Dervarics, 2002). The following research articles support the effectiveness of TRIO programs in private universities nationwide, Rutgers University, and Purdue University.

Balz and Esten (1998) used the Beginning Post Secondary Student Survey (90/94) to compare first-generation and continuing-generation students. Balz and Esten determined that private colleges had higher graduation rates overall for both first-generation and continuing-generation students. TRIO participants had higher overall satisfaction with higher education, course curricula, development of work skills, and counseling and job placement than similar students who did not participate in TRIO.

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TRIO participants who attended private colleges had higher graduation rates than students who attended public four-year colleges, and four-year public colleges had higher graduation rates of TRIO participants than two-year community colleges. TRIO participants also experienced higher rates of educational attainment than similar non TRIO participants. Balz and Esten (1998) concluded that TRIO programs are effective, but there are many more eligible students that could benefit from TRIO that are not currently being served.

Thomas, Farrow, and Martinez (1998) evaluated the effectiveness of the Rutgers Student Support Services Program (RSSSP) by comparing graduation rates of TRIO participants and others. Thomas et al. (1998) compiled rosters of RSSSP participants for cohorts starting in years 1980 through 1992. The goal of RSSSP was to graduate at least 50 percent of their participants and on average they were successful. The TRIO graduation rates were slightly lower than the continuing-generation students because they were not able to control the other population to have similar background characteristics as the TRIO participants. Thomas et al. (1998) concluded that the TRIO participants experienced an exceptional graduation rate. Thomas et al. (1998) contributed the success of TRIO participants at Rutgers to the supportive institutional climate and network of available student services.

Dale (1996) conducted a similar, but more sophisticated, evaluation of the HORIZONS TRIO program at Purdue University. Dale used school (major area), race, and entering academic skills to match the 47 first-year students who participated in HORIZONS in 1990 with 47 similar students who did not participate. This was a longitudinal study that tracked these students for ten semesters. The program had

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dramatic results: 85% of the HORIZONS participants were retained by the university, where-as only 47% of their counterparts were retained.

Dale (1996) also set out to determine what the HORIZONS program was doing to achieve such success. Dale had the HORIZONS participants complete a questionnaire to determine the perceived benefits. Dale found that the HORIZONS participants valued the "sense of security" and "tutoring and study skills training" the most. The HORIZONS TRIO program at Purdue requires participants to enroll in a "Strategies for Effective Academic Performance" course the first semester as well as a "Community Building/Personal Growth Laboratory". These courses were taught by HORIZONS staff so they could continue to assess students' needs, introduce students to the campus resources, and give students a caring faculty member contact. Dale concluded that the higher retention rates of the HORIZONS participants provided a strong rationale for continued federal support of the program. More research such as these studies needs to be conducted at other campuses to determine the economic feasibility of TRIO programs.

Non-TRIO Interventions

A national emphasis on first-year experience programs for new entering first-year students has pushed many colleges, universities, and high schools to implement programs to promote access, retention, and graduation of students of color, low-income students, and first-generation students. The University of Akron's School of Engineering hosts an extensive program to increase under-represented populations in Science, Technology, Engineering, and Math (STEM) fields. NACADA offers best practices for advising first-generation students, and Perez (1998) categorized intervention strategies.

The University of Akron's School of Engineering teamed up with the University's academic achievement programs to offer a program to increase the number

of under-represented students in STEM fields. The programs consists of a six-week integrated curriculum over the summer, as well as career workshops during the academic year, and a freshman transition program. Lam, Srivatsan, Doverspike, Vesalo, and Mawasha (2005) evaluated the program and found positive results. The researchers measured high school grade point average before students started the programs and after they completed the program. Average high school grade point average increased for participants from 2.67 to 2.89 on a 4.0 scale. All of the participants graduated from high school, and 66% of the participants majored in a STEM related field.

Quality academic advising and support for first-generation students is key to retaining them. The National Academic Advising Association (NACADA), based at Kansas State University, provides guidance for advising first-generation college students. Sickels (2004) states that first-generation students' parents often times do not provide the same kind of academic support and advice as continuing-generation students' parents so first-generation students tend to lean on someone at the university for academic advice and guidance navigating the university's services. According to Sickles, successful advising for first-generation students involves building a trusting relationship with first-generation students and providing them with comprehensive information about campus resources and assistance accessing these resources. First-generation students may require more of an advisor's time during the first few months of their educational experience. "It is imperative that academic advisors be prepared to support and guide first-generation students" (Sickles, 2004, p. 2).

Folger, Carter, and Chase (2004) evaluated the effectiveness of the Freshman Empowerment Program on the success of first-generation students at a medium size, Midwestern university. According to Astin (1996), student development is strongly

influenced by students' peers. The Freshman Empowerment Program was designed to optimize first-generation students' peer interactions and support. This program enrolled first-generation students who self identified as having difficulty transitioning to college. The Freshmen Empowerment groups met in groups of 6-10 students for 90 minutes a week throughout the first semester to discuss academics, resources, relationships, and adjusting to college. The Freshmen Empowerment participants were compared to similar students who did not participate. Folger et al. (2004) found that participants in the Freshmen Empowerment program had a higher mean grade point average and higher retention rate.

Gibbons and Shoffner (2004) proposed that high school counselors could better serve first-generation students using the Social Cognitive Career Theory. First-generation students need additional assistance getting through the college going pipeline and Social Cognitive Career Theory is effective, as Gibbons and Shoffner showed in the case study of one specific student. Social Cognitive Career Theory consists of three primary tenets: self efficacy, outcomes expectations, and goals.

<center>Strengths and Weaknesses of the Research Overall</center>

The research literature on first-generation college students began in the 1980s and expanded in terms of research methods and sophistication of the statistical analysis. Prior to the 1980s, limited research on college student success gave brief mention of parent education level as a predictive variable. During the 1980s and 1990s, the literature focused specifically on first-generation status and compared differences in pre-college traits and college experiences among first-generation and continuing-generation students using simple statistical analysis. In the late 1990s, Terenzini et al.'s (1996) model of

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college impact was introduced as a useful conceptual framework to study the impact of pre-college traits associated with first-generation status on the college experience and learning outcomes. Recently a great deal of national research on first-generation college students has been conducted using sophisticated statistical analysis. National research is valuable but cannot illustrate the impact of single-institution initiatives on first-generation college students.

The literature in the 1990s and 2000s focused on aspects included in Terenzini et al.'s (1996) model of college impact and supports continued application of this model. Terenzini et al. (1996) used the model to frame the analysis of a national data set. Since 2000, many other researchers have either used Terenzini et al.'s (1996) model or parts of it to frame additional national studies (Horn & Nunez, 2000; Choy, 2001; Warburton et al., 2001; Hahs-Vaughn, 2004; Duggan, 2004; Somers et al., 2004; Pascarella et al., 2004; and Pike and Kuh, 2005). Since 2000, no research was found that applies Terenzini et al.'s model to a single, medium sized university.

<div align="center">Research Questions</div>

Research on differences in pre-college traits, college experience, and learning outcomes among first-generation and continuing-generation students at medium size, public, four-year, comprehensive university is lacking. In the context of Terenzini et al.'s (1996) model, research questions are posed to investigate the differences as well the causal connections among the parts of Terenzini et al.'s (1996) model. The research questions include the following:

Pre-college traits:

- Do first-generation students and continuing-generation students at a medium sized, public university differ in demographic background, characteristics, academic preparedness, and college expectations? If they differ, how, and to what extent?

College experience:

- Do first-generation and continuing-generation students at a medium sized, public university differ in their college experiences in terms of in-class experience, out-of-class experience, and overall institutional experience?

Learning outcomes:

- Do first-generation and continuing-generation students at a medium sized, public university differ in their learning outcomes, such as CAAP scores, and grade point average?
- Are first-generation students and continuing-generation students retained at the same rate at a medium sized, public university?

Chapter 3

RESEARCH METHODOLOGY

Research at individual institutions can reveal how unique institutional characteristics may affect the college experience for first-generation students. The study institution intends to increase retention and graduation rates among all students. Investigating differences between first-generation students and continuing-generation students at a medium-sized public university in terms of retention and graduation rates; factors that impact retention and graduation rates could reveal changes the institution could make to improve retention and graduation rates.

This study will compare first-generation and continuing-generation students at the study institution in terms of pre-college traits, the college experience, and learning outcomes to determine if there are statistically significant differences between first-generation and continuing-generation students. Four separate research questions have been posed and these questions are paired with approximately sixty variables from the assessment data in order to answer the research questions. Appendix A contains a full list of the variables. First-generation and continuing-generation student data will be compared on each individual variable. The Assessment and Institutional Research Office at the study institution collects longitudinal data with tested, research-based survey items.

Research comparing first-generation and continuing-generation college students at the national and single-institution level has found that first-generation students are less likely to attend, be retained, and graduate from college than their continuing-generation counterparts. Terenzini et al. (1996) hypothesized that first-generation students enter college with different demographic background, motivations, expectations, and levels of academic preparedness than continuing-generation students. These differences are

correlated with first-generation students' different choices in terms of college selection, major selection, study habits, and work habits. These differences may also be correlated with how first-generation students perceive their college experience. The different pre-college traits, choices and perceptions may yield differences in learning outcomes.

Terenzini et al.'s (1996) conceptual framework has been used with predominantly national datasets. National datasets offer insight on national trends, but are not specific enough to recognize the efforts or unique environmental characteristics of individual institutions. Terenzini et al.'s (1996) conceptual framework will be used to compare first-generation and continuing-generation students at an individual institution. In this study, first-generation and continuing-generation students at the study institution will be compared in terms pre-college traits, within college experiences, and learning outcomes within Terenzini et al.'s (1996) conceptual framewor, in order to identify unique environmental characteristics of a single-institution.

Institutional Context

The study institution is a medium-sized, public, four-year, comprehensive university in the midwest. As one of the seven universities in the state college and university system, the study institution has a commitment to access and undergraduate education. A large majority of the students are white, traditional-aged students from Minnesota, Wisconsin, Illinois, and Iowa who live on or near campus. Statistics provided by the Institutional Research Office portray information about characteristics of the study institution's student population.

Statistics on the overall student population, contained in Table 1 show, that the study institution is a medium-sized campus, with just under 8,000 students, with about 5

Table 1

Demographic Characteristics of Students

	Year			
	Fall 2005		Fall 2006	
	N	%	N	%
Enrollment	7,444		7,613	
Gender				
Male	2,755	37	2,817	37
Female	4,615	62	4,644	61
Unknown	74	1	76	1
Status				
Full time	6,774	91	7,003	92
Part time	669	9	532	7
Ethnicity				
Caucasian	6,252	84	6,471	85
Non-Caucasian	521	7	380	5
Unknown	669	9	456	6
Student Type				
Transfer	1,786	24	1,750	23
Non- transfer	5,657	76	5,557	73
Living				
Live on campus	2,679	36	2,512	33
Live off campus	4,764	64	5,062	66

percent students of color. As Table 2 illustrates, the study institution's students are quite

traditional in age, with an average age of students of 23, and most students are enrolled

full-time. Table 3 shows that new entering first-year students have an average ACT

composite score of 23, and their average class rank is in the 60th to 70th percentile.

Table 2

Average age and credit load – Fall 2005 data

	N	Percent	Average Age	Avg Credit load
Freshman	2,273	33	18	15
Sophomore	1,492	21	20	15
Junior	1,282	18	21	15
Senior	1,726	25	23	14
Special	126	2	21	10
Previous Degree	69	1	33	9
Total	6968	100	23	15

Figure 1 illustrates retention rates by entering cohorts from 1989 through 2006.

According to Figure 1, on average, approximately 70% of first-year students return for

their sophomore year, and less than half of the students who start at the study institution

are retained four years later. Figure 2 displays the institution's graduation rates 4, 5, and 7

years after students begin. The 2002 four-year graduation rate at the study institution is

about 25%. As illustrated in Figures 1 and 2, the institution has experienced a small

increase in retention and graduation rates in the past several years.

Table 3

New Entering Freshmen Average High School Percentile and ACT Score

	2002		2003		2004		2005		2006	
	ACT	HS%	ACT	HS%	ACT	HS%	ACT	HS%	ACT	HS%
Region										
SE MN	22	68	22	65	22	65	22	66	22	65
TC	22	64	22	63	23	60	23	62	22	58
O MN	23	72	22	72	22	66	22	72	22	72
State										
MN	22	67	22	65	22	64	23	65	22	63
WI	22	68	22	66	22	61	22	66	22	64
IA	23	67	23	62	24	59	25	84	23	67
IL	24	74	24	73	24	60	24	61	24	61
OS	22	64	24	79	23	58	24	72	24	62
Total	22	67	22	66	22	62	23	65	23	63
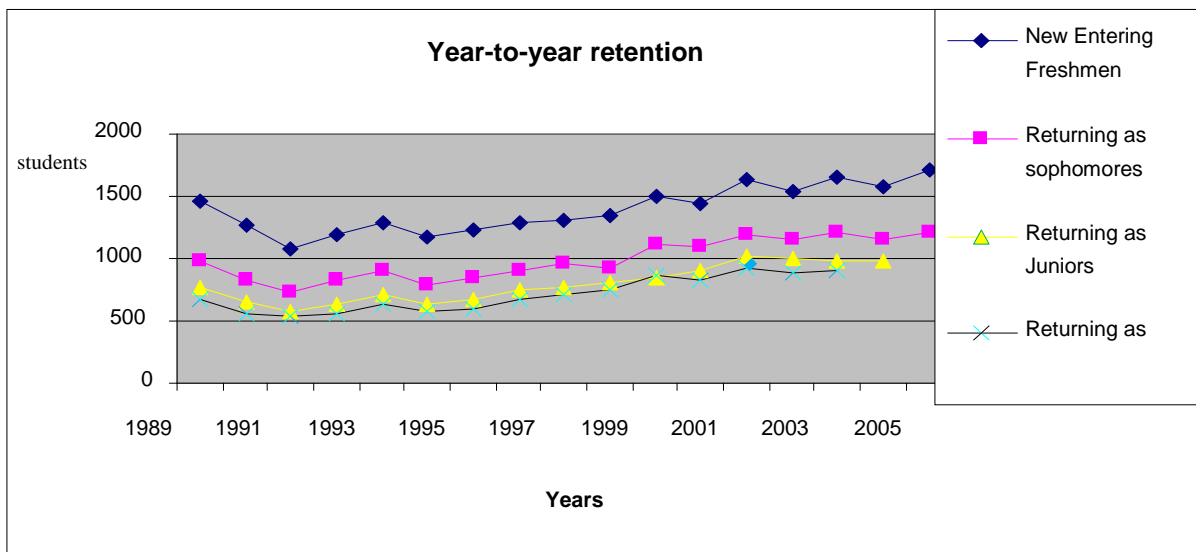
Figure 2 Year-to-year Retention by Year in School 1989-2006
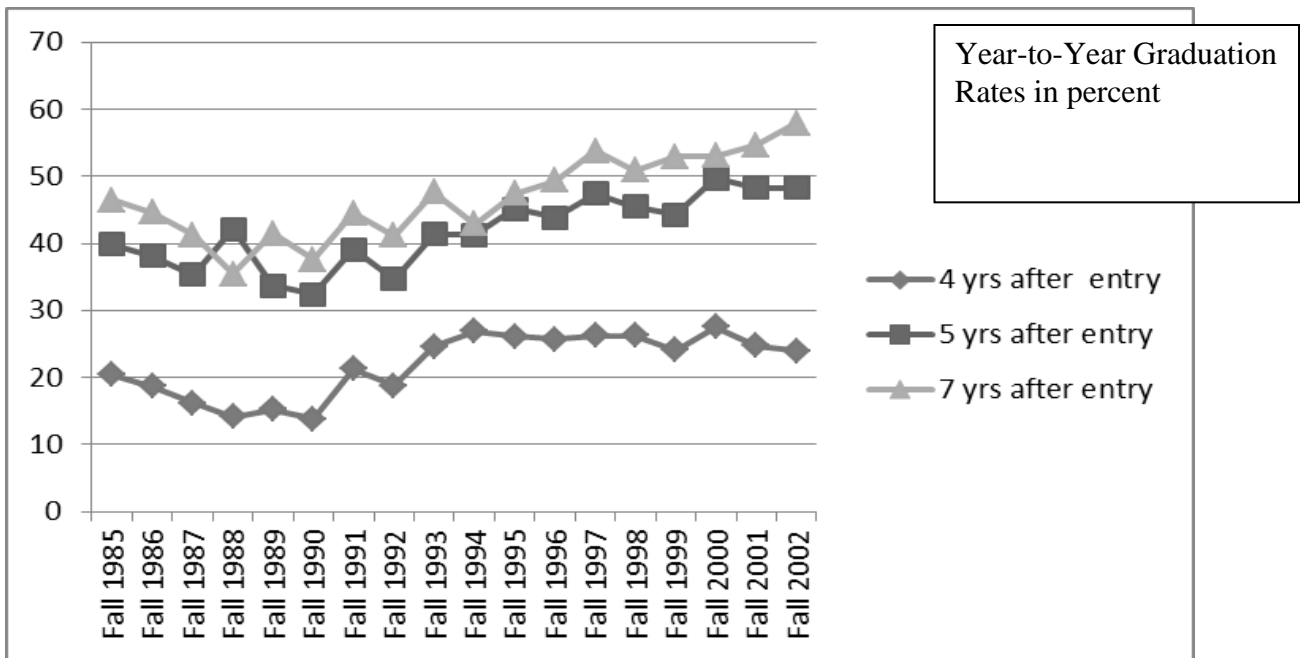
Figure 3 Year-to-Year Graduation Rates

As the statistics suggest, overall enrollments, retention rates, and graduation rates at the study institution have been reasonably steady since the mid to late 1980s. Enrollment, retention, and graduation rates at the study institution have had a slightly increasing trend since the late 1980s. The enrollment goals at the study institution over the past several years have been to: (a) slowly and slightly increase enrollment by increasing the number of new entering freshmen, retention rates and graduation rates; (b) increase the number of students of color; and (c) increase the average new entering student profile in terms of ACT composite score and class rank. The aforementioned results indicate that the study institution is meeting its enrollment goals in terms of increasing the number of new entering first-year students, measuring the retention and graduation rates, and increasing the academic ability of the average new entering student. Data gathered by the Student Support Services office indicates that nearly half of all new entering first year students at the study institution are first-generation students.

The data in Table 4 are provided by the Student Support Services office. As Table 4 below indicates, almost 10% of these new entering first year students are low-income and first-generation. The data in Table 4 are gathered each year at first year student registration. Each student is asked to fill out a survey for the Student Support Services office. The responses are self-reported by students.

Student Support Services (SSS) defines first-generation students as students with neither parent having a bachelor's degree. First-generation student status has many definitions in the literature. Terenzini et al. (1996) and Pascarella et al. (2004) defined first-generation college students as students whose parents have no college experience at all. Warburton et al. (2001), Choy (2001), and Horn and Nunez (2000) aggregated

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Table 4

Number and Percent of New Entering Freshmen who are First-generation, and First-generation and Low-Income, by year 1996-2006

					Year						
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Number of First Year Students Enrolled											
	1,286	1,278	1,341	1,477	1,471	1,634	1,539	1,654	1,575	1,721	1,734
Number of First Year Students Responding											
N	801	753	1081	1059	1275	1326	1036	1423	1353	1535	1541
%	62	59	81	72	87	81	67	86	86	89	89
First-Generation											
N	410	407	609	563	715	717	553	704	651	765	758
%	51	54	56	53	56	54	53	49	48	50	49
Low-Income FG											
N	210	236	367	348	234	78	78	120	89	121	101
%	51	58	60	61	32	11	14	15	14	16	13

students by parent education level into three different groups: first-generation- neither parent had more than a high school education; some college- one or both parents had some post-secondary education but neither parent had attained a bachelor's degree; and college graduate – one or both parents earned a bachelor's degree or higher. SSS defines low-income as Federal Pell grant recipients. Prior to 2000, SSS defined low-income as any student reporting the receipt of financial aid, which explains the dramatic change in the percentage of low income students in the year 2000.

<div align="center">Overall Research Design</div>

Terenzini et al.'s (1996) model of college impact will serve as the conceptual framework for the research design in this study. According to Terenzini et al.'s model of college impact, students enter college with certain characteristics, make decisions during college that impact their college experience, and leave college with varied learning outcomes. Pre-college characteristics, within college experiences, and learning outcomes share a causal relationship. Terenzini et al. proposed that first-generation and continuing-generation students are different in terms of pre-college characteristics, within college experiences, and learning outcomes. This study will determine if first-generation and continuing-generation students at the study institution differ in terms of pre-college characteristics, within-college experiences, and learning outcomes.

This study will use data collected by the Institutional Research and Assessment Offices in order to compare first-generation and continuing-generation students in terms of pre-college characteristics, within-college experiences, and learning outcomes. Approximately 60 variables within the study institution's assessment and student records

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data will be used to compare first-generation and continuing generation students within

Terenzini et al's. (1996) framework.

Construction of the Data Set

Table 5

Data Available, by Module and Year Term

	Year			
	2004	2005	2006	2007
Modules				
Demographic Data	X	X	X	X
Background Info	X	X	X	X
Pre Enrollment	X	X	X	X
CAAP Test	X	X	X	X
Data Update	X	X	X	X
Social Behaviors	X	X	X	X
Study Habits in Gen Ed	X	X	X	X
Campus Perception	X	X	X	X
General Satisfaction	X	X	X	X
Quality of Instruction	X	X	X	X
Quality of Service	X	X	X	X
Cumulative GPA	X	X	X	X

Pre-College Characteristics

All students are asked to participate in the Assessment Day Survey, and as results in Table 6 indicate, approximately half of the eligible students voluntarily responded to the survey. Although the data set will have some missing data, the data set is reasonably complete. The Institutional Research Office provided the data for each of the 60 variables. They provided one large file, with each student responding to the data with only a unique ID number that remains consistent from module to module and from year to year. Also obtained were the following variables from the Pre-Enrollment survey to determine first-generation status: highest level of education obtained by your father, and highest level of education obtained by your mother. First-generation students will be defined as those responding for whom neither parent has a bachelor's degree.

The study institution started collecting its data online during its annual Assessment Day in 1999. Since the advent of the online data collection in 2003, participation rates increased and the data reportedly more accurate. This research will use the new entering freshmen cohorts of 2004 through 2006 to compare the above listed variables for first-generation and continuing-generation students.

Rationale for Variable Selection

Research Questions

Each research question is based on part of Terenzini et al.'s (1996) conceptual framework. Every question focuses on one of the constructs within the framework. The first research question focuses on pre-college traits. The next research question focuses on different aspects of the student experience. The last two research questions focus on

Table 6

Modules Assigned by Year in School

Modules	Freshmen	Sophomore	Junior	Senior
Pre-Enrollment	X			
Data Update	X	X	X	X
Campus Perception	X	X	X	
General Satisfaction	X	X	X	X
Social Behaviors	X	X	X	
Satisfaction w/ course curriculum in the General Education		X		
Satisfaction w/ course curriculum in the major				X
Skill development in the Gen Ed			X	
Skill development in the Major				X
Study Habits in the Gen Ed		X		
Study Habits in the Major				X
Quality of Instruction in the Gen Ed		X		
Quality of Instruction in the Major				X
Quality of Services	X	X	X	X
CAAP		X	X	
Focus Group	X			
Departmental Assessment			X	X

learning outcomes, one on the Collegiate Assessment of Academic Proficiency and grade point average and one on retention rate. Each question includes subcategories.

The pre-college traits question includes subcategories of demographic background, motivation, and academic preparedness. The institutional context question can be categorized into overall institutional context, in-class experiences, out-of-class experiences, and coursework and curriculum patterns. The variables available in the assessment data do not allow me to investigate specific course choice and curriculum patterns. The learning outcomes category includes retention, number of credits completed, and grade point average.

The variables available in the assessment data are similar to variables investigated by other researchers. National research finds that first-generation students share a common set of demographic backgrounds traits such as being low income, racial/ethnic minorities, female and older (Terenzini et al. 1996; Inman & Mayes, 1999; and Bui, 2002). Most of the research literature included some demographic information on their research subjects. In this study, demographic background characteristics such as socio-economic status (parent income level), race, gender, and age will be included.

Motivational variables for attending college have been compared for first-generation college students and continuing-generation college students. Conklin and Dailey (1981) investigated the impact of parental motivation. Inman and Mayes (1999), Penrose (2002), Bui (2002), and Billson and Terry (1982) compared personal motivations such as economic motivation and the desire for academic improvement between first-generation and continuing-generation students. Motivations will be examined based on students responses to eight questions such as "Because your parents wanted you to go to college."

Academic preparedness levels can impact success in college. Penrose (2002) , Riehl (1994), Hahs-Vaughn (2004), Bui (2002), Horn and Nunez (2000), and Choy (2001) investigated different measures of academic preparedness prior to entering college (e.g., ACT and SAT scores), and compared these measures for first-generation and continuing-generation college students. Penrose, Riehl, Hahs-Vaughn, and Bui (2002) compared pre-college standardized test scores like ACT and SAT. This study compared ACT composite scores for first-generation and continuing-generation students. Choy (2001) and Horn and Nunez (2000) investigated the rigor of high school curricula. This study will compare the number of college preparation courses first-generation and continuing-generation students took in high school.

Within College Experience

Pascarella and Terenzini (1991, 2005) argued that what happens to a student while in college is more important than where a student goes to college in terms of college impact on the student. Terenzini et al.'s (1996) framework postulated that certain pre-college traits will impact how a student interacts with the institution. The institutional context question encompasses everything that happens to a student while in college, including overall atmosphere of the college, the classroom experience, the out-of-class experience, and the coursework and curriculum pattern.

The classroom participation variable is part of the classroom experience construct within Terenzini et al.'s (1996) conceptual framework. Researchers have not been consistent in the variables used for measuring classroom participation. Terenzini et al. mentions classroom participation but never defines it. This study will include twenty questions that measure classroom participation levels such as the frequency of participation in classroom discussions.

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The out-of-classroom experience construct in Terenzini et al.'s (1996) model includes variables such as: perceived faculty concern, hours per week employed off campus, participation in a racial/cultural workshop, encouragement from friends to continue enrollment, attendance at an orientation program, and relationship with student peers. The literature review outlined similar variables that other researchers have investigated.

This research will include eighteen questions in five categories in the study institution's assessment data. The five categories are study and work habits, cultural socialization, involvement on campus, living on campus and sources of funding. The variables are survey items such as "How many weekends do you spend in town?" and "How often do you participate in academic clubs and organizations?" Billson and Terry (1982) compared first-generation and continuing-generation students on six similar categories: social integration, academic integration, support, college experience, satisfaction with college, and commitment to college.

Billson and Terry (1982), Hahs-Vaughn (2004), and Pascarella et al. (2004) compared the number of hours students worked while enrolled in college, and found that first-generation students were more likely to work more hours per week than their continuing-generation counterparts. Terenzini et al. (1996) compared time spent studying for first-generation and continuing-generation students and found that continuing-generation students were more likely to spend more time studying than their first-generation counterparts. In order to measure study and work habits, two variables will be examined: estimated number of hours spent working per week this past semester and estimated number of hours spent studying per week this past semester.

Terenzini et al.'s (1996) comparison of first-generation and continuing-generation college students included participation in a racial/cultural workshop as a variable in their out-of-class experiences in college and found that first-generation students were much less likely to participate in a racial/cultural workshop. Terenzini et al. does not define the rationale behind this variable but as our society continues to become more culturally diverse, awareness and understanding continues to become an increasingly important goal of higher education. This study will use the "How often do you socialize with someone from a different racial/ethnic group" variable.

Astin (1984) theorizes that students learn more and are more likely to be retained if they are involved on campus. Grayson (1997), Billson and Terry (1982), Hahs-Vaughn (2004), and Pascarella et al. (2004) compared campus involvement levels for first-generation and continuing-generation students and found that first-generation students were less likely to be involved in college. Pike and Kuh (2005) did not measure campus involvement specifically, but measured social and academic engagement instead and found that first-generation students had lower levels of social and academic engagement than their continuing-generation counterparts. Involvement on campus will be measured by the following variables: "How often do you participate in academic clubs or organizations?", "How often do you participate in school social clubs or organizations?", "How many weekends do you stay in town".

Astin's (1984) Theory of Involvement included place of residence and argued that students who live on campus are more likely to be involved in other areas of campus life and are more likely to be retained. Billson and Terry (1982), Pascarella et al. (2004), and Pike and Kuh (2005) all compared the first-year living experience for first-generation and continuing-generation students and found that first-generation students were less likely to

live on campus their first year. Retention rates for first-generation and continuing-generation students have been obtained from the Assessment and Institutional Research office and will be compared and analyzed.

Somers et al. (2004) compared the impact of price and the receipt of financial aid for first-generation and continuing-generation students and found that both price and financial aid had a more significant impact on the retention of first-generation students than continuing-generation students. As the price of higher education goes up or the amount of financial aid awarded goes down, first-generation students are less likely to be retained in school than their continuing-generation counterparts. In this study the students' estimate of parents' income variable will be used to infer the receipt of financial aid for the student.

The institutional context construct of Terenzini et al.'s (1996) conceptual framework includes organizational characteristics, policies, structures, and culture. Part of campus culture is sense of community. A unique aspect of the study institution is the commitment to developing community. This commitment to community is based on the work of Ernest Boyer (1990). Sense of community and students' overall satisfaction will be measured based on ten variables such as "I feel I can make life-long friends."

Learning Outcomes

The research literature indicates that learning outcomes are not measured consistently. Various assessments, graduation rates, retention rates, and grade point averages have been compared for first-generation and continuing-generation college students to research learning outcomes. This research will compare results on the Collegiate Assessment of Academic Proficiency taken by first-generation and continuing-generation college students at the study institution. This research will also compare

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cumulative grade point averages for first-generation and continuing-generation college students.

<div align="center">History of Assessment at the Study Institution</div>

The study institution has been committed to assessment of quality and continuous improvement since the 1980s, which is evidenced in the Long Range Plan and Quality Assurance and Assessment Plan. The current administration aims to maintain quality assessment as a means to increase retention and graduation rates. According to the FY 06 Presidential Workplan, the first-year retention rate goal is to exceed 80% and the 6-year graduation rate goal will reach 56% by 2010 (Ramaley, 2006). Research comparing first-generation students with continuing-generation students will help administration determine whether or not a focus on first-generation student programming is needed to impact retention and graduation rates. These single-institution research findings may be generalized to other schools of similar size, demographic make-up, and scope.

> "A historical overview of the highlights of assessment at [the study institution]
> The history of systemic student assessement at [the study institution] began with the tenure of the then new president. He brought with him a wealth of assessment knowledge and experience from [his previous institution], where he had served as the vice president of academic affairs for seventeen years. [The study institution] had collected much useful data pertaining to student characteristics, student outcomes, and student satisfaction since the mid 1980's, but no systemic assessment plan for the university had been developed. Around the same time that [the new president] came to [the study institution], a Blue Ribbon Commission created by the state university board, presented a report on Access and Quality in the state university system on September 25, 1990. These two events would have a dramatic effect on the future of assessment at [the study institution]. Beginning in the Fall of 1989, the Outcomes, Processes, and Indicators Committee was convened at to develop an assessment plan for the university. This plan containing an expectations document and identifying a set of principles to guide the assessment process was developed over the next nine months and approved by the Faculty Senate in the Spring of 1993.
> Beginning in the Fall of 1990, the university set out to develop a Long Range Plan and Mission statement including a comprehensive Quality Assurance and Assessment Plan which identified Quality Indicators for the university across 18 broad goals. These documents, developed over a two year period, became the

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basis for planning and assessment throughout the decade of the 1990's. The Quality Assurance and Assessment Plan were approved by all constituency groups of the university in May of 1993.

During the period from 1993 to 1995, the university began collecting data on the 256 quality indicators identified in the assessment plan and began funding for academic departments to work on their own individual assessment plans. In 1995 the NCA assessment plan was submitted, containing 80 key indicators based on input, process, result, and feedback measures. Results of these assessment indicators and some basic trend data began to appear in the [study institution's] data book and a making a better university document during the mid 1990's.

Using the information from the data collection on assessment indicators from 1993 through 1996, the university further refined assessment and planning efforts in 1997 with the advent of a revised university mission statement and the development of the leadership emphases. These Leadership Emphases focused the university planning and assessment efforts around seven primary themes including: Student Success, Student Satisfaction, General Education, Faculty and Staff Development, Partnership, Technology, and Enrollment. Although data on all of the original indicators in the Quality Assurance and Assessment document continued to be collected, special emphasis and attention were placed on the data relating to the Leadership Emphases which began a more short-term strategic planning effort of the university.

Out of this strategic planning effort evolved six university distinctives that were to guide the university into the 21st century. The six distinctives used to identify important characteristics for which the university stood and for which it aspired to be recognized as included: leadership in the application of technology, dynamic undergraduate university, unparalled educational value, powerful sense of place and community, self regarding, and principle centered.
(Assessment Databook, 2005)"

As the excerpt above indicates, systemic assessment at [the study institution] was

started by the university president in 1989 and has continued to evolve. The Quality

Assurance and Assessment Plan Goals, Objectives, and Indicators served as the starting

point, but assessment items at the time of this study have less to do with the original

quality indicators. Assessment items, this study is based on, are focused on the Seven

Principles for Good Practice in Undergraduate Education. The assessment authors started

with the inventories developed by the same conference that authored the Seven Principles

and then went on to review other surveys such as the CIRP (Cooperative Institutional

Research Program), the CSEQ (College Student Experience Questionnaire), the NSSE

(National Survey of Student Engagement), the Noel Levitz Student Satisfaction Inventory, and ACT surveys being used across the nation, and adapted survey items. These adapted survey items seemed to be the best way to measure the kinds of objectives that the study institution wanted to measure. Using survey items from these national surveys also allowed the institution to make national comparisons.

In 1999, the study institution started to collect data online annually during their once-a-year assessment day. On assessment day, students are asked to log-in to a protected online survey using their student identification number. Students receive assigned survey modules based on the number of credits they have completed. No student receives all of the survey modules. On assessment day, students are also asked to take the CAAP exam and/or participate in a focus group based on the number of credits they have earned. The same student identification number is used on the survey, CAAP, and in the focus groups so tracking all of the responses for a single student and accessing additional student information available only in the student record data-base such as entering ACT score and current cumulative grade point average is possible. The assessment day survey consists of fifteen different modules. Modules are assigned based on the number of credits students have earned. Table 5 outlines the modules, and indicates how students are assigned based on the number of credits they have earned.

Data collected from the voluntary survey modules and the CAAP exam is easy to quantify. Data collected from the focus groups and departmental assessments is not easy to quantify. This research will be using only the data collected from the survey modules and the CAAP exam.

The Assessment and Institutional Research staff consulted many leaders in higher education research and assessment throughout the process. Assessment and Institutional

Research staff were involved with the Seven Principles conference and became familiar with the individual authors such as Alexander W. Astin of UCLA, Howard Bowen of the Claremont Colleges, William Boyd of The Johnson Foundation, Carol M. Boyer of the Education Commission of the States (a co-sponsor of the conference), K. Patricia Cross of Harvard, Kenneth Eble of the University of Utah, Russell Edgerton of AAHE (a co-sponsor of the conference), Jerry Gaff of Hamline University, Henry Halsted of The Johnson Foundation, Joseph Katz of SUNY-Stony Brook, C. Robert Pace of UCLA, Marvin Peterson of the University of Michigan, and Richard C. Richardson, Jr. of Arizona State University. Peter Ewell and Dennis Jones of the National Center for Higher Education Management Systems (NCHEMS) also served as consultants during assessment planning in February of 1997 and May of 1998.

Student response to the online survey, participation in the CAAP exam, and participation in the focus groups is completely voluntary. Faculty are asked to encourage participation, but the only additional incentive offered is extra credit for survey response or focus group participation.

Students who complete the CAAP exam receive priority registration and the top five scores on each section of the exam receive fifty dollars each. As seen in Table 7, over half of the eligible students voluntarily responded to the survey items. Participation rates make it a reasonable set of data for the purpose of this research.

During pre-registration, new entering first year students are asked to fill out the pre-enrollment survey which contains questions about the students' demographic background traits, motivations for going to college, and expectations of college life.

The annual assessment survey is administered on-line every February. All of the data obtained from this survey is self-reported by students who voluntarily respond to the

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Table 7

Survey Response Rates for Modules Used From Assessment Day for Years 2004-2006

	Spring 2004			Spring 2005			Spring 2006		
Module	Eligible	Taken	%	Eligible	Taken	%	Eligible	Taken	%
Campus Perceptions	2,987	1,920	64	2,968	1,752	59	2,979	1,794	60
General Satisfaction	3,587	2,307	64	3,544	2,074	59	3,555	2,119	60
Social Behaviors	2,987	1,920	64	2,958	1,752	59	2,979	1,791	60

survey. Many faculty members require completion of the assessment day survey or award extra credit for participating in the survey. The survey has a secure login and is available online for two weeks starting on the February assessment day. The survey consists of fourteen different modules, each with a different focus. The fourteen different modules are: data update, campus perceptions, general satisfaction, social behaviors satisfaction with course curriculum- general education, satisfaction with course curriculum- major, skill development – general education, skill development – major courses, study habits general education, study habits – major courses, quality of instruction – general education, quality of instruction – major, quality of services, and CAAP.

Modules

Data Update Module

The "Data Update Module" provides student background information that would be difficult to obtain otherwise, (e.g., how many hours per week do our students study and work.) This module allows the institution to ask the important questions of every single student to answer such as "Are you returning in the fall?, how many weekends do you spend in town?, and where do you purchase your textbooks?" The "Data Update Module" is administered to every student completing the assessment survey. In 2005, 4,072 students completed this module, 54% of the total student enrollment.

Campus Perceptions Module

The "Campus Perceptions Module" gauges students' perceptions of community at the institution, and tries to determine if students have a sense of a connection to the campus community. A sense of campus community and a connection to that community is correlated with increased retention and graduation rates (Boyer, 1990). In this module, students are asked if they strongly agree, agree, disagree, or strongly disagree with statements such as "I feel part of a community of learners." and "The institution is student centered". Students who have completed 16-45 or 61-90 credits are asked to complete this module. In 2006, 1,794 students completed this module, or 60% of eligible students.

Social Behaviors Module

The "social behaviors module" asks a student about the frequency of their behaviors such as how many times a week do they volunteer, drink alcohol, and exercise. Social behaviors can impact student performance and the student experience. Students

who have completed 16-45 or 61-90 credits are asked to complete this module. In 2006, 1,791 students completed this module or 60% of eligible students.

Satisfaction with Course Curriculum- General Education

The general education curriculum exposes students to diverse, new ideas and provides a well-rounded base for continued learning. The institution wants to ensure that students are satisfied with their general education courses. Students with 46-60 credits were asked to complete this module, and in 2006, 465 students completed the module, or 60% of eligible students. Students are asked to report their satisfaction level with the variety of general education courses, the availability of general education courses, the content, the quality of instruction, the class size and the grading of general education courses.

Satisfaction with Course Curriculum- Major

Major courses are meant to prepare students within their chosen fields. The institution wants to ensure that students are satisfied with their major courses. In this module, students are asked to report their satisfaction levels with course availability, quality of instruction, course content, variety of courses, capstone experiences, academic advising, overall college experience, preparation for career or grad school, class size, and grading in their major. Students with 106 or more earned credits are asked to complete this module. In 2006, 865 students completed this module, or 54% of eligible students.

Skill Development – General Education courses

Skills needed after graduation should be developed in the general education and major courses. The "skill development- general education" module asks students to report how much their general education courses contributed to the development of their skills such as working in groups, coping with change, developing moral principles, appreciating

the arts, and developing presentation skills. Students who have between 61 and 90 credit hours earned were asked to complete this module. In 2006, 870 students completed this survey, or 59% of eligible students.

Skill Development- Major

The "skill development- major" module measures the student's perceptions of how significantly the major courses contributed to their skill development. Students with 91-105 completed credit hours are asked to complete this module and in 2006, 324 students completed the module, or 56% of eligible students.

Study Habits- General Education and Major

The study habits modules originated from the Seven Principles for Good Practice in Undergraduate Education inventories. The institution believes the Seven Principles are a good base for successful study habits. The study habits modules are asked in terms of study habits in general education courses and study habits in major courses. Students with 46-60 credit hours are asked to complete the study habits in general education courses module, while students with 106 or more earned credit hours are asked to complete the study habits in major courses module. The survey items in these two modules are the same. In 2006, 462 or 60% of the eligible students completed the study habits in the general education module, and 865 or 54% of the eligible students completed the study habits in the major module.

Quality of Instruction Modules- General Education and Major

The Quality of Instruction modules are also addressed separately in terms of general education and major courses but the same survey items are asked. The Quality of Instruction module is also based on the Seven Principles for Good Practice in Undergraduate Education, asking students to report the frequency their professors did

things that correspond to the seven principles such as use a variety of teaching methods, required more than five pages of writing, required oral presentations in class, and provided frequent feedback. The Quality of Instruction in the general education module was administered to students with 46-60 credit hours and in 2006, 459 or 59% of the eligible students completed the module. The Quality of Instruction in the major module was administered to students with 106 or more credits earned and in 2006, 865 students completed the module, or 54% of eligible students.

Principles of Good Practice in Undergraduate Education Module

The Principles of Good Practice in Undergraduate Education module groups the survey items from the study habits modules and the quality of instruction modules into the corresponding principles but keeps them separated by general education and major. The reports generated from this module show the frequency that students and faculty practice each of the seven principles.

Quality of Services Module

The quality of services module measures student satisfaction with 18 different support units such as the writing center, tutoring services, the bookstore, the dining areas, housing, and financial aid. The quality of services module is administered to students who have completed 16-45 and 61-105 credits and gives students the opportunity to share narrative comments on each area if they feel strongly one way or the other about the university support units.

CAAP Exam

ACT's Collegiate Assessment of Academic Proficiency (CAAP) exam is administered separately from the online assessment survey on the annual assessment day. The CAAP measures general academic skills in writing, reading, math, science

reasoning, and critical thinking. The exam takes 1 ½ hours and is administered in person.
Students who have completed 40-75 credits are asked to take the exam. Students who
take the exam are given priority registration for the following semester, and students with
the top 5 scores are awarded $50. Fifteen percent of eligible students volunteered to
participate.

Completion of the online assessment survey modules is completely voluntary.
The entire student population is encouraged to respond to the online assessment survey
and a little over half of the eligible students responded to the survey. Participation rates
make this data set a reasonably good set of data. The entire student population is defined
as the population and 50% of them respond to a typical module.
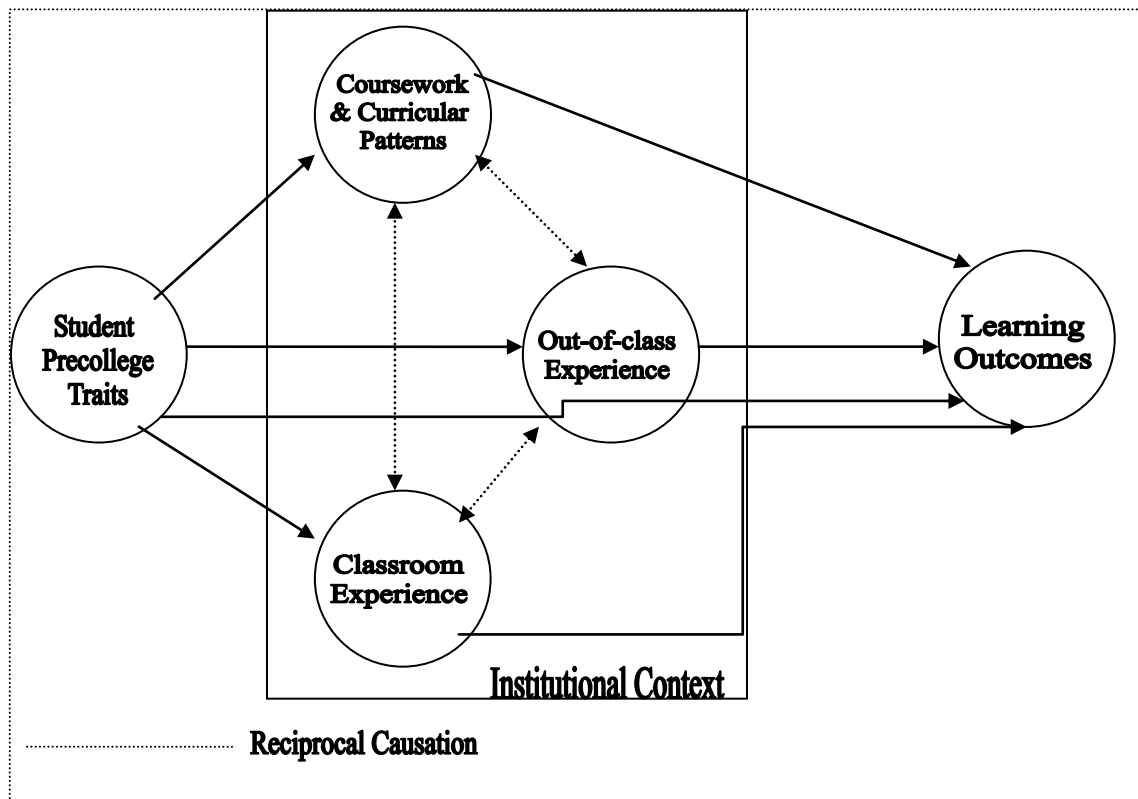
Figure 4

Conceptual Framework

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Terenzini et al.'s (1996) conceptual framework, as presented in Figure 4 will be used in comparing first-generation students and continuing-generation students. Terenzini et al. summarize that, what is known specifically about first-generation students falls into three categories that follow the order of the college experience: pre-college, transition to college, and the effects of the college experience on persistence in college. Terenzini et al's. research questions also followed the order of the college experience. The first question investigated pre-college characteristics, the second question investigated the transition to college by examining the first-year experience, and the third question sought to determine if there are differences in cognitive development. All three questions framed the comparison of first-generation and continuing-generation students.

Tereznini et al.'s (1996) conceptual framework incorporates college impact theories of Astin (1984), Pascarella (1985), Tinto (1975, 1987), and Weidman (1989). Terezini et al. propose "six sets of constructs defining a causal sequence" (p. 3). The constructs also following the same order mentioned above are: pre-college traits, coursework and curriculum patterns, classroom experience, out of class experience, institutional context, and learning outcomes. According to Terenzini et al. "pre-college characteristics are presumed to influence not only the outcomes of college directly, but also students' course-taking patterns, formal classroom experiences, and out of class experiences during college which in turn, also shape educational outcomes" (p. 3).

Terenzini et al. (1996), in their comparison of first-generation and continuing-generation students, used approximately 80 variables in two categories. The two categories are pre-college characteristics and within college experiences. The most statistically significant differences between first-generation and continuing-generation

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students were in the family income, ethnicity, pre-college CAAP score, highest degree sought, and encouragement from family pre-college variables. Within college experiences variables were categorized into curricular experiences, academic experiences, out of class experiences, and institutional characteristics. The most statistically significant differences were in the number of humanities and fine arts courses completed variable.

<div align="center">Research Questions</div>

The research questions for this study follow a similar order. The study will investigate differences in pre-college traits, within college experiences, and learning outcomes between first-generation and continuing-generation students. The data were provided by the Assessment and Institutional Research office to answer the research questions. Although the assessment data are not identical to the data collected by Terenzini et al. (1996), there are similarities. The next section illustrates how Terenzini et al.'s framework has been used to guide the selection of data housed in the Assessment and Institutional Research Office.

Question 1

The first research question is: Do first-generation and continuing-generation students differ in pre-college traits? Fifteen different variables in three different categories have been identified. The variables come from the pre-enrollment module and the student records data-base. Four variables are categorized as demographic background variables such as race. Six variables are categorized as motivation variables such as to make more money. Four variables are categorized as academic preparedness variables, such as ACT score.

Question 2

The second research question is: Do first-generation and continuing-generation students differ in terms of their college experience? Thirty-eight variables in three different categories have been identified. The variables come from the Study Habits in the General Education Module, the Data Update Module, the Social Behaviors Module, the Student Records Data-base, the Pre-Enrollment Survey, the Campus Perceptions Module, and the General Satisfaction Module. Twenty variables are categorized as in-class experiences, such as participating in class discussions. Eight variables are categorized as out-of-class experiences, such as estimated number of hours spent working per week this past semester. Ten variables are categorized as institutional experiences, such as "I can make life-long friends."

Question 3

The third research question compares learning outcomes for first-generation and continuing-generation students. The questions are: Do first-generation and continuing-generation students differ in cumulative grade point average at the end of the first year? And do first-generation and continuing-generation students perform differently on the CAAP exam? The cumulative grade point average will be collected from the student records data-base. The CAAP exam is administered to sophomore and junior student volunteers on assessment day each year. The CAAP exam has five different subject areas. Students are only administered two different subject areas.

Question 4

The fourth research question compares retention rates for first-generation and continuing-generation students. The Assessment and Institutional Research office tracks retention rates by first-generation status for the study institution. The study institution

defines first-generation status as students whose parents have not earned a Bachelor's degree. Findings will determine if retention rates overall are different for first-generation and continuing-generation students.

Statistical Analysis

This study will compare first-generation and continuing-generation college students on all of the variables using chi-square and or t-test statistics. In order to isolate certain variables, in relation to learning outcomes, multiple regression analysis will be used.

The variables used in this research study have either numeric or categorical responses. Numeric variables include variables such as GPA. A majority of the variables are variables with Likert-scaled type responses. Chi-square statistics will be used to compare categorical variables for first-generation and continuing-generation students.

Chapter 4

RESULTS

This chapter contains the results of the current study, which explored the difference in pre-college traits, within-college experiences, and learning outcomes between first-generation and continuing-generation college students at a medium sized public university. This study examined approximately 53 variables in the aforementioned three categories based on Terenzini et al.'s (1996) theoretical framework. A t-test was conducted for approximately 45 variables, whereas a chi-square analysis was used for the remaining eight variables. A standard least squares regression analysis was also performed with cumulative GPA as the dependent variable and gender, ACT, parent income and generation status as the independent variables.

Conceptual Framework

Terenzini et al's. (1996) model of college impact served as the conceptual framework for this study. Variables were categorized within the constructs of the model of college impact. Terenzini et al's. (1996) model describes the relationship between students' pre-college traits, their within-college experiences, and their learning outcomes. Pre-college traits include demographic background, motivations to attend college, and academic preparedness. Within-college experiences include classroom experiences, out-of-class experiences, and overall institutional satisfaction. Learning outcomes include cumulative grade point average and results of the CAAP examination.

Pre-College Traits

Pre-college traits variables include demographic variables, academic preparedness variables, and motivation to go to college variables. Results indicated that first-generation college students and continuing-generation college students at the study institution differed in terms of ACT composite score, parental income, gender, and motivations to attend college.

Demographic Variables

The demographic variables are parents' total income, gender, age, and race.

Income. Students were asked to indicate their parents' total yearly income within the following choices: 1= less than $10,000, 2 = $10,001 to $25,000, 3 = $25,001 to $50,000, 4 = $50,001 to $75,000, 5 = $75,001 to $100,000, 6 = $100,001 to $150,000, and 7= over $150,000. Results in Table 8 indicate a statistically significant difference in parents' total income between first-generation (FG) and continuing-generation (CG) students in this study. First-generation students are more likely to be in the lower income categories and less likely to be in the higher income categories. For example 28.3% of first-generation students reported parental income of $25,001-50,000, whereas 14.6% of continuing-generation students reported the same parental income level.

Gender. Results in Table 9 indicate a statistically significant difference in gender between first-generation and continuing-generation students. This research found first-generation students are more likely to be females: 72.3% of the first-generation students are female whereas only 64.1% of the continuing-generation students are female.

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Age and Race. There is not a statistically significant difference in age or race between first-generation and continuing-generation college students. A two-sample independent t-test was done to determine if there was a difference in age between first-generation and continuing-generation students. The mean ages of the two groups were

Table 8

Students' Response to Estimate of Parents' Total Yearly Income

	Income ($N=4,964$)				
	FG		CG		
Income	N	%	N	%	Chi-square
< $10,000	37	1.5	26	1.0	433.07***
$10,000 to $25,000	207	8.6	87	3.4	
$25,001 to $50,000	682	28.3	374	14.6	
$50,001 to $75,000	779	32.3	656	25.7	
$75,001 to $100,000	449	18.6	676	26.5	
$100,001 to $150,000	194	8.1	488	19.1	
>$150,000	61	2.5	248	9.7	

*** $p < .001$

almost exactly the same (M=18.1, $t = 1.06$). Nearly all of the students at the study institution are of traditional college age. There is a very small age range, and 88.9 % of the first-generation and 87.3% of the continuing-generation students were 18 years of age.

A chi-square analysis was conducted to determine if there was a statistically significant difference in race between first-generation and continuing-generation students, and no statistically significant difference was found. The options for race were re-categorized

Table 9

Gender Difference Between First-generation and Continuing-generation College Students

	Gender (N=5,154)				
	FG		CG		
Gender	N	%	N	%	Chi-Square
Male	690	27.7	956	35.9	39.95***
Female	1801	72.3	1707	64.1	

*** $p < .001$

as white, black, and other, since the number of students of color at the study institution is very small, the number of Hispanic, Asian, and American Indian students would have been too small of a sample..

Academic Preparedness Variables

ACT Composite and Field of Study

ACT Composite Score. The first academic preparedness variable is ACT composite scores. A two-sample t-test was conducted to determine difference. Previous research has suggested first-generation students are more likely to have lower ACT

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Table 10

Race Comparison Between First-generation and Continuing-generation Students

	Race (*N=5,157*)				
	FG		CG		
Race	N	%	N	%	Chi-square
White	2,251	90.3	2,416	90.7	.44
Black	16	.6	14	.5	
Other	226	9.1	234	8.8	

scores than continuing-generation students. This research found a statistically significant difference in composite ACT score with first-generation students averaging 22.1 and continuing-generation students averaging 22.84 (N=5,114, $t= 9.63^{***}$).

Field of Study. Field of study is the second academic preparedness variable. Students knowing their field of study prior to entering the university is an indicator of their level of college knowledge and preparedness. Survey response choices were "not sure", "somewhat sure", and "definite". As the results in Table 11 indicate, this research did not find a statistically significant difference between first-generation and continuing-generation college students in their response to the "Do you know your field of study?" item when asked prior to entering the university.

Table 11

Comparison Between First-generation and Continuing-generation Students on How Confident They are in Their Major Choice Prior to Entering the University

	Group (*N= 5,135*)				
	FG		CG		
Response	N	%	N	%	Chi-square
Not Sure	338	13.6	350	13.2	3.69
Somewhat Sure	991	39.9	1129	42.6	
Definite	1153	46.5	1174	44.3	

Motivations to Attend College

The motivation to go to college variables are, "because your parents wanted you to go," " so you could find a job/career that interests you," " to gain a broad liberal education," " to improve your reading and study skills," " to become a more cultured person," " to be able to make more money," " to learn about your interests," and "to get training for a specific career." The response choices were coded as follows 1= not important, 2 = somewhat important, 3= moderately important, and 4 = very important. As the results in Table 12 indicate, there were statistically significant differences between first-generation and continuing-generation students for three of the seven motivations to

attend college variables. This research found first-generation students gave higher importance ratings to "to be able to make more money," and "to get training for a specific career" and continuing-generation students gave higher importance ratings to "to be able to make more money," and "to get training for a specific career" and continuing-generation students gave higher importance rating to "because your parents wanted you to go". The research did not find a statistically significant difference for the remaining four variables.

Within-college Experience

The within-college experience variables included students' in-class experience and out-of-class experience. This data was collected during an annual online survey administered in the years of 2004, 2005, 2006, and 2007. The survey is comprised of 14 different modules. The modules are administered based on the number of credits the student has earned. No student received all 14 modules in one survey year. The variables in Tables 14, 15, and 18 were taken from various modules so the N varies for each variable. This is cumulative data across the years 2004-2007.

In-Class Experiences

The 19 in-class experience variables have Likert-scale responses coded as follows 1=never, 2=rarely, 3=occasionally, and 4=usually to statements such as , "I am a participant in class discussions." As the results in Table 13 indicate, there is statistically significant difference between first-generation and continuing-generation students in in-class participation in four of the nineteen variables. There is a statistically significant

Table 12

Comparison Between First-generation and Continuing-generation Students in Their Motivation to Attend College

	Group (*N=5,151*)												
	FG						CG						
	Not	Some what	Mod	Very			Not	Some what	Mod	Very			
	N	N	N	N			N	N	N	N			
Question	%	%	%	%	m	SD	%	%	%	%	m	SD	t-test
Because your parents wanted you to go	483	756	725	524	2.33	.70	490	744	808	621	2.31	.69	-2.33**
	19.4	30.4	29.1	21.1			18.4	27.9	30.3	23.3			
To find a job/career that interests you	22	108	480	1,880	3.69	.59	47	114	465	2,035	3.69	.64	.431
	.9	4.3	19.3	75.5			1.8	4.3	17.5	76.5			
To gain a broad/liberal education	90	373	983	1,041	3.2	.82	98	444	993	1,124	3.18	.84	.613
	3.6	15	39.5	41.9			3.7	16.7	37.3	42.3			

Table 12 continued

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Table 12 continued

	FG						CG						
	Not	Somewhat	Mod	Very			Not	Somewhat	Mod	Very			
	N	N	N	N			N	N	N	N			
Question	%	%	%	%	x	SD	%	%	%	%	x	SD	t-test
To improve reading or study skills			992	631	2.84	.88	166	696	1111	688	2.87	.87	-1.40
	6.9	27.8	39.9	25.4			6.2	26.1	41.8	25.9			
To make more money	48	201	693	1,543	3.5	.73	89	244	763	1,562	3.43	.79	3.42***
	1.9	8.1	27.9	62.1			3.4	9.2	28.7	58.8			
To learn more about your interests	51	266	921	1,249	3.35	.75	46	272	958	1,380	3.38	.74	-1.36
	2.1	10.7	37.0	50.2			1.7	10.2	36.1	52.0			
To get specific career training	16	104	448	1,911	3.72	.57	25	170	524	1,937	3.65	.64	4.10***
	.7	4.2	18.1	77.1			.9	6.4	19.7	72.9			

*p<.05,   **p<.01,   ***p<.001

difference between first-generation and continuing-generation students in their responses to "I am a participant in class," ($p<.001$) "I want professors to know my name,"($p<.05$) "I am willing to get to know other students in my class,"($p<.05$) and "I practice oral presentations out loud before I deliver them in class," ($<.05$). First-generation students are less likely than continuing-generation students to: participate in class discussions, want professors to know their name, to be willing to get to know their classmates, and to practice oral presentations out loud before they deliver them in class. The rest of the variables did not produce a statistically significant difference between the two groups.

<div align="center">Overall Institutional Satisfaction</div>

The seven overall institutional satisfaction variables also have Likert-scale responses, which have been coded as 1=never, 2 = rarely, 3 = occasionally, and 4= usually. As the results in Table 14 indicate, there is a statistically significant difference between first-generation and continuing-generation students on their feelings of being known as an individual at the study institution. First-generation students have a lower mean for the item "I am known as an individual here" variable.

Out-of-Class

The out-of-class variables ask students to estimate the number of hours each week students spend in certain activities such as working off campus and studying. A t-test was done for the number of hours spent working off campus per week and the number of hours spent studying per week. Students were allowed to just fill in their estimated number of hours, no choices or categories were given. Some out-of-class variables have a Likert scale responses of not at all, few times, once a month, 2-3 times a month, 1-2 times a week, and more than 1-2 times a week.

Number of Hours Worked. As the results in Table 15 indicate, there is a statistically significant difference in the number of hours worked off campus. First-generation students work more hours off campus.

Table 13

Comparison Between First-generation and Continuing-generation Students for In-class Experiences

	Group (*N=600*)												
	FG						CG						
	never	rarely	occ.	usually			never	rarely	occ.	usually			
	N	N	N	N			N	N	N	N			
Item	%	%	%	%	m	SD	%	%	%	%	m	SD	t-test
I am a participant in class discussions	4	70	122	69	2.96	.047	4	61	149	121	3.15	.042	-3.03**
	1.5	26.4	46.1	26.0			1.2	18.2	44.5	36.1			
I ask questions in class if I don't understand	5	65	115	81	3.02	.791	6	63	153	112	3.11	.765	-1.38
	1.9	24.4	43.2	30.5			1.8	18.9	45.8	33.5			

	FG						CG						
	never	rarely	occ.	usually			never	rarely	occ.	usually			
	N	N	N	N			N	N	N	N			
Item	%	%	%	%	m	SD	%	%	%	%	m	SD	t-test
I want my professors to know my name	2	22	89	153	3.47	.680	3	20	95	216	3.57	.648	-1.67*
	.8	8.3	33.5	57.5			.9	6.0	28.4	64.7			
I keep class assignments and projects during the semester	0	10	61	194	3.69	.537	0	12	76	245	3.70	.532	-.122
	0	3.8	23.0	73.2			0	3.6	22.8	73.8			
I am willing to get to know other students in my class	1	9	66	189	3.67	.559	0	8	69	258	3.75	.488	-1.72*
	.4	3.4	24.9	71.3			0	2.4	20.6	77.0			

Table 13 continued

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	FG						CG						
	never	rarely	occ.	usually			never	rarely	occ.	usually			
	N	N	N	N			N	N	N	N			
Item	%	%	%	%	m	SD	%	%	%	%	m	SD	t-test
I use BlackBoard when available	2	9	35	220	3.77	.535	4	16	48	267	3.72	.606	1.13
	.8	3.4	13.2	82.7			1.2	4.8	14.3	79.7			
I study with other students in my courses	8	53	115	89	3.08	.808	4	70	135	125	3.14	.783	-.995
	3.0	2.0	43.4	33.6			1.2	21.0	40.4	37.4			
I ask classmates and friends for comments on assignments and projects before I turn them in	12	67	106	80	2.96	.858	18	85	141	90	2.91	.856	.727
	4.5	25.3	40.0	30.2			5.4	25.5	42.2	27.0			
I try to help classmates who are having trouble understanding a difficult class	1	21	109	134	3.42	.653	1	17	141	176	3.47	.608	-.956
	.4	7.9	41.1	50.6			.3	5.1	42.1	52.5			

Table 13 continued

	FG						CG						
	never	rarely	occ.	usually			never	rarely	occ.	usually			
	N	N	N	N			N	N	N	N			
Item	%	%	%	%	m	SD	%	%	%	%	m	SD	t-test
I will ask for comments from my professors before an assignment is due	11	74	119	59	2.86	.810	12	82	167	74	2.90	.776	-.69
	4.2	28.1	45.3	22.4			3.6	24.5	49.9	22.1			
I try to tie together material from different courses	2	34	116	111	3.28	.712	2	26	161	144	3.34	.647	-1.15
	.8	12.9	44.1	42.2			.6	7.8	48.4	43.2			
I practice oral presentations out loud before I deliver them in	7	37	71	149	3.37	.822	9	36	74	215	3.48	.793	-1.66*
	2.7	14.0	26.9	56.4			2.7	10.8	22.2	64.4			

	FG						CG						
	never	rarely	occ.	usually			never	rarely	occ.	usually			
	N	N	N	N			N	N	N	N			
Item	%	%	%	%	m	SD	%	%	%	%	m	SD	t-test
I try to relate what I learned in class to the real world	1	22	123	117	3.35	.649	3	21	151	159	3.40	.648	-.778
	.4	8.4	46.8	44.5			.9	6.3	45.2	47.6			
I do just enough to get by in my courses	50	128	68	18	2.20	.825	61	158	94	22	2.23	.821	-.373
	18.9	48.5	25.7	6.8			18.2	47.2	28.1	6.6			
I participate fully in class activities and demonstrations	1	45	152	65	3.07	.656	5	45	190	95	3.12	.682	-.927
	.4	17.1	57.8	24.7			1.5	13.4	56.7	28.4			

Table 13 continued

	FG						CG						
	never	rarely	occ.	usually			never	rarely	occ.	usually			
	N	N	N	N			N	N	N	N			
Item	%	%	%	%	m	SD	%	%	%	%	m	SD	t-test
I try to learn from feedback I have received	2	13	98	151	3.51	.626	2	8	121	203	3.57	.574	-1.29
	.8	4.9	37.1	57.2			.6	2.4	36.2	60.8			
I attend class on a regular basis	0	4	10	251	3.93	.306	0	1	19	314	3.93	.255	-.216
	0	1.5	3.8	94.7			0	.3	5.7	94.0			
I come to class prepared	0	1	34	229	3.86	.355	0	3	47	283	3.84	.390	.746
	0	.4	12.9	86.7			0	.9	14.1	85.0			

Table 13 continued

	FG						CG						
	never	rarely	occ.	usually			never	rarely	occ.	usually			
	N	N	N	N			N	N	N	N			
Item	%	%	%	%	m	SD	%	%	%	%	m	SD	t-test
I use my laptop for IM, web, and email	71	98	79	16	2.15	.890	92	120	102	21	2.15	.899	-.050
	26.9	37.1	29.9	6.1			27.5	35.8	30.5	6.3			

*$p<.05$ **$p<.01$

Table 14

Comparison Between First-generation and Continuing-generation-students on Overall Institutional Context Variables

	Group (N=1,837)												
	FG						CG						
	never	rarely	occ.	usually			never	rarely	occ.	usually			
	N	N	N	N			N	N	N	N			
Item	%	%	%	%	m	SD	%	%	%	%	m	SD	t-test
Classes encourage interaction and discussion	6	105	570	180	3.07	.595	10	125	641	192	3.04	.606	.876
	.7	12.2	66.2	20.9			1.0	12.9	66.2	19.8			
Professors on campus offer high quality instruction	7	108	599	149	3.03	.574	19	115	662	172	3.02	.612	.420
	.8	12.5	69.4	17.3			2.0	11.9	68.3	17.8			

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Table 14 continued

Item	FG							CG					
	never	rarely	occ.	usually				never	rarely	occ.	usually		
	N	N	N	N				N	N	N	N		
	%	%	%	%	m	SD	%	%	%	%	m	SD	t-test
This school is committed to academic excellence	0	36	556	272	3.27	.531	4	28	657	284	3.25	.522	.742
	0	4.2	64.4	31.5				.4	2.9	67.5	29.2			
Students are made to feel welcome here	4	32	530	296	3.30	.558	6	28	601	337	3.31	.554	-.329
	.5	3.7	61.5	34.3				.6	2.9	61.8	34.7			
I feel part of a community of learners here	11	101	512	239	3.13	.653	17	117	584	251	3.10	.663	1.01
	1.3	11.7	59.3	27.7				1.8	12.1	60.3	25.9			
I am known as an individual here	24	158	487	193	2.98	.720	20	168	535	247	3.04	.714	-1.65*
	2.8	18.3	56.5	22.4				2.1	17.3	55.2	24.5			

Table 14 continued

Item	FG						CG					
	never	rarely	occ.	usually			never	rarely	occ.	usually		
	N	N	N	N			N	N	N	N		
	%	%	%	%	x	SD	%	%	%	%	x	SD	t-test
This school is student centered	7	70	561	223	3.16	.589	15	87	622	247	3.13	.623	.972
	.8	8.1	65.2	25.9			1.5	9.0	64.1	25.4			
I feel safe on campus	4	31	482	344	3.35	.573	4	28	543	394	3.37	.562	-.572
	.5	3.6	56.0	40.0			.4	2.9	56.0	40.7			

*p<.05

Number of Hours Studying. As table 15 indicates, there is no statistically significant difference between first-generation and continuing-generation students in the number of hours spent per week studying.

Table 15

Comparison Between First-generation and Continuing-generation Students in the Number of Hours Spent Working and Studying Each Week.

Question	Group Working (*N=3,633*) Studying (*N=2,693*)					
	FG			CG		
	N	M	SD	N	M	SD
# of hours spent per week working off campus						
	1,262	5.75	8.9	1,371	4.03	7.63
# of hours spent per week studying						
	1,291	13.26	8.8	1,402	13.62	9.12

-1.02

*** *p<.001*

Stay on campus. A Chi-square analysis was done to compare how often students stay in town on the weekends. Choices for this question were commute, every weekend on campus, alternate weekends on campus, one weekend per month on campus, rarely on campus on the weekends, and no weekends on campus. As the results in Table 16, indicate there is a statistically significant difference in the responses of first-generation

and continuing-generation students. First-generation students are more likely to commute or go home more frequently. For example 4.22% of first-generation students are commuters whereas only 1.17% of continuing-generation students are commuters.

Table 16

Comparison Between First-generation and Continuing-generation students in Commuting and the Frequency of Staying on Campus on the Weekends

	Group (*N=2,619*)				
	FG		CG		
Response	N	%	N	%	Chi-square
Commute	53	4.22	16	1.17	
					65.75***
Every Weekend on campus	526	41.91	728	53.37	
Alternate Weekends on campus	474	37.77	490	35.92	
One weekend a month on campus	78	6.21	43	3.15	
Rarely on campus on weekends	76	6.06	59	4.32	
No weekends on campus	48	3.82	28	2.05	

***p<.001

Participation in Activities. A Chi-square analysis was done to compare club participation and socializing with someone of another race between first-generation and continuing-generation students. Choices were as follows, "not at all," " few times," " once a month," "2-3 times a month," " 1-2 times a month," and "more than two times a week." As the results in Table 17 indicate, there was no statistically significant difference between first-generation and continuing-generation students' responses to these variables.

Learning Outcomes

This study used results from the Collegiate Assessment of Academic Proficiency (CAAP) exam and cumulative grade point average to measure learning outcomes. A t-test was conducted to determine difference in CAAP exam results between first-generation and continuing-generation students as well as cumulative grade point average between first-generation and continuing-generation students.

CAAP is an ACT program designed to help post-secondary institutions assess and evaluate student learning. CAAP consists of five, 40-minute sections. Student volunteers are administered two of the five sections. The study institution administers the CAAP exam to first-year and second-year student volunteers during the annual assessment day. Student volunteers receive priority registration for participating in the CAAP exam and the top three scores on each section of the exam receive bookstore gift cards. This research is using CAAP results across 2004, 2005, 2006, and 2007. The

Table 17

Comparison Between First-generation and Continuing-generation Students Out-of-class

Experiences

| Experience | Group (N=1,829) | | | | | |
| | FG | | CG | | | |
	N	%	N	%	Chi-square
Participate in Academic Clubs					
Not at all	362	42.0	385	40.0	1.28
Few times	131	15.2	157	16.3	
Once a month	111	12.9	128	13.3	
2-3 times a month	102	11.9	113	11.7	
1-2 times a week	94	10.9	104	10.8	
More than twice/ week	61	7.1	76	7.9	
Participate in Social Clubs					
Not at all	345	40.1	344	35.6	7.24
Few times	132	15.4	171	17.7	

Once a month	111	12.9	120	12.4	
2-3 times a month	98	11.4	108	11.17	
1-2 times a week	108	12.6	126	13.0	
More than twice/week	66	7.7	98	10.1	
Socialize with someone of another race					
Not at all	18	2.1	26	2.7	6.17
Few times	40	4.7	42	4.32	
Once a month	62	7.2	80	8.2	
2-3 times a month	148	17.3	147	15.1	
1-2 times a week	238	27.8	240	24.7	
More than twice/week	350	40.9	438	45.0	

number of students that test results are available for is small in comparison to the results for the rest of the variables. Although the CAAP exam results are a reasonably good sample, confidence in this comparison of variables is not as high as for the rest the comparisons of the variables.

As the results in Table 19 indicate, statistically significant differences were found in scores on the writing section of the CAAP and in cumulative grade point average. First-generation college students at the study institution have a lower average CAAP

writing score and a lower average cumulative grade point average. First-generation

college students had an average cumulative GPA of 2.83 and continuing-generation

Table 18

First Year Retention Rate Comparison between First-generation and Continuing-

generation Students

	1st year Retention Rate		4 year Graduation Rate	
	FG Rate	CG Rate	FG Rate	CG Rate
2000	75.6	81.3	26.4	32.1
2001	73.0	77.0	26.2	28.8
2002	75.0	77.7	26.4	27.6
2003	70.1	76.7	24.0	27.3
2004	71.9	74.0	27.0	26.0
2005	70.0	71.3	28.6	29.4
2006	69.9	73.4		
2007	72.1	74.9		
2008	72.0	76.9		

students had an average cumulative GPA of 2.91. There was no statistically significant difference on CAAP Science, CAAP Math, CAAP Critical Thinking, or CAAP Reading scores.

Retention was not a variable provided in the same database as the rest of the variables but the institutional research office did provide retention and graduation rates for first-generation and continuing-generation students. First-generation students at the research institution have lower first year retention rates than continuing-generation students. On average first-generation students have lower four-year graduation rates than continuing-generation students.

<div align="center">Regression Analysis</div>

The results presented in this research considered the bivariate relationship between status (i.e., first-generation and continuing-generation) for a set of 53 variables within three categories (i.e., Pre-College Traits, Within College Experience, and Learning Outcomes). Although informative, the possibility of correlations amongst the variables means that what appear to be differences between the two groups may be due, in part or largely, as a result of correlations with other variables.

In this regression analysis, variables which yielded statistically significant differences between the two groups and variables with a large number of students responding were used. Not all of the variables within a particular category (e.g., within college experience) were used in the analysis. Given the complex nature of the assessment process on

campus, i.e. modules assigned based on credit count, many of variables used in the previous analyses had a relatively small n and were not used. Although it would been

Table 19

Comparison of Cumulative GPA and CAAP scores Between First-generation and Continuing-generation College Students.

		Group						
		FG			CG			
Variable	N	N	M	SD	N	M	SD	t-test
Cum GPA	3,694	1,784	2.83	.78	1,906	2.91	.74	-3.14**
Writing	146	66	65.1	3.78	80	66.4	3.69	-2.07*
Math	143	76	58.8	2.88	67	59.4	3.63	-1.13
Reading	175	71	63.0	5.09	104	63.9	4.70	-1.26
Critical Thinking	132	61	64.0	4.78	71	63.3	4.43	.82
Science	158	81	63.2	3.81	72	63.3	3.64	-.23

*p <.05 ** p<.01

desirable to include in the analysis some of the student experience variables, the numbers of students for whom such results were available were relatively small. Hence, only those

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variables for which data were available for large numbers of first-generation and continuing-generation students were used. The following variables were used in a multiple ordinary least squares regression with cumulative GPA as the criterion variable: gender, ACT, parent income, and first-generation and continuing generation status.

Cumulative GPA is an indicator of academic success and is a strong predictor of retention and graduation. A standard least squares analysis was performed for further analysis of the relationship between the following independent variables: gender, ACT, parent income, and first or continuing generation status and the dependent variable of cumulative GPA. I then ran an analysis of variance for gender, ACT, and parent income for both first-generation and continuing- generation students together and then first-generation and continuing-generation students separately.

For this regression analysis I recoded gender and generation status status to numerical values. Gender has been recoded as 0 for male and 1 for female. Generation status has been recode as 0 for continuing-generation student and 1 for first generation student.

In the standard least squares regression analysis the R Square value is 0.1097 which is low R square value. The percent of variation in GPA accounted for by the independent variables gender, ACT, parent income and first-generation status is low (*R square* = .1907). Even though the variables of gender, ACT, and generation status are statistically significant the variation in GPA that can be attributed to these variables is actually quite low. In this regression analysis parent income was not a statistically

significant predictor of GPA. In this regression analysis female and first generation

student variables have a negative effect on GPA and ACT has a positive effect on GPA.

Table 20

Regression Analysis of Cumulative GPA and Gender, ACT, Parent Income, and

Generation Status (N=3550)

Variable	SLOPE	*t*	sig level
Female	-.172	-13.19	.0001*
ACT	.068	16.29	.0001*
Parents' Income	-.011	-1.18	.2391
FG	-.032	-2.41	-.0160*

*p < .01

In the standard least squares regression analysis parent income did not have a

statistically significant relationship with GPA. Regression searches for a straight line

relationship, but a simple scatterplot showed a bell-shaped curve relationship between

parent income and cumulative GPA.

A one-way analysis of variance of cumulative GPA by parent income does

indicate a statistically significant relationship (6, 3,568 = 2.90 *p*= .0079). It appears that

middle income students have better average cumulative GPA's than low and high income

students. A one-way analysis of variance of cumulative GPA by parent income for only first-generation college students does not show a statistically significant relationship (6, 1,728 = 1.20 p = .2997). A one-way analysis of variance of cumulative GPA by parent income for continuing-generation college students does show a statistically significant relationship (6, 1,833= 3.1060 p = .0050).

A one-way analysis of variance of cumulative GPA by ACT was done for the entire sample (21, 3,641 = 13.55 p<.001) as well as one for first-generation students (20, 1,751 = 6.3806 p<.001) and one for continuing-generation students (20, 1,870 = 8.3512 p<.0001) was conducted and a statistically significant relationship was found in all three analysis of variance. A one-way analysis of variance of cumulative GPA by gender was done for the entire sample (1, 3,687 = 148.9096 p<.0001) a statistically significant relationship was found.

Chapter 5

DISCUSSION

Introduction

This chapter will illustrate and discuss differences and similarities found between first-generation and continuing-generation college students within the literature and at the study institution. The questions this study intends to answer are:

- Do first-generation and continuing-generation students differ in pre-college traits?
- Do first-generation and continuing-generation students differ in terms of their college experience?
- Do first-generation and continuing-generation students differ in cumulative grade point average?
- Do first-generation and continuing-generation students perform differently on the CAAP exam? And
- Are first-generation and continuing-generation students retained at the same rate?

The research questions are based on the constructs of Terenzini et al.'s (1996) conceptual framework.

The constructs of Terenzini et al.'s (1996) conceptual framework are pre-college traits, within college experience, and learning outcomes. This study explored differences in data between first-generation and continuing-generation students at a four year

medium sized public university in the Midwest. This study explored 53 variables

categorized into pre-college traits, within college experience or learning outcomes.

Summary of the Findings

Differences and similarities with previously reported results were found in each

category. First-generation students at the study institution differed in terms of pre-college

factors. They were more likely to have a lower composite ACT score, lower parental

income, and be female. First-generation college students at the study institution differed

in terms of pre-college motivation factors. They were more likely to be motivated to

attend college to gain career specific training and make more money, and less motivated

than continuing-generation students to go to college because their parents wanted them to

go. First-generation college students at the study institution differed in terms of in-class

and out-of-class experiences. They were less likely to participate in class discussions, less

likely to want professors to know their name, less willing to get to know other students in

their classes, less likely to practice oral presentations out loud, and less likely to feel like

they are treated as an individual. First-generation students were more likely to work more

hours off campus, more likely to commute to campus, and more likely to go home on

weekends. First-generation college students at the study institution differed in terms of

learning outcomes. They have a lower overall cumulative GPA and do not perform as

well on the CAAP writing exam. First-generation students were less likely to be retained

from the 1st to 2nd year of college.

First-generation and continuing-generation students at the study institution were

not statistically different on pre-college traits in terms of age, being decided on a major

prior to entering, race, wanting to attend college to gain a liberal arts education, wanting to go to college to improve reading skills, and wanting to go to college to pursue their interests. First-generation and continuing-generation students were not statistically different in institutional context in terms of the study habits in general education course variables, campus perception variables, satisfaction with the campus, laptop use, and number of hours spent studying. First-generation and continuing-generation students were not statistically different in learning outcomes in terms of the CAAP Math score, the CAAP Reading score, the CAAP Critical Thinking score, and the CAAP Science Score.

There were differences and similarities between results of this study and results previously reported in the literature. A discussion of the literature and this research on Terenzini et al.'s (1996) conceptual framework follows. Although the literature and this research compared different variables for pre-college traits, within college experiences, and learning outcomes for first-generation and continuing-generation students, it is still possible to compare the findings of the literature and this research.

Research Question #1

Do first-generation and continuing-generation students differ in pre-college traits? Pre-college traits in this research were categorized into demographic variables, academic preparedness variables, and motivation to go to school variables. The demographic variables were parents' total yearly income, gender, age, and race. The academic preparedness variables were ACT composite score and if a student is decided on a major. The motivation to go to school variables included: because your parents

wanted you to go, so you could find a job/career that interests you, to gain a broad liberal education, to improve your reading and study skills, to become a more cultured person, to be able to make more money, to learn about your interests, and to get specific career training.

A review of the literature showed statistically significant differences between first-generation and continuing-generation students in some demographic variables, academic preparedness variables, and motivations to go to college variables. The literature review showed that first-generation students are more likely to come from low-income families (Terezini et al., 1996; Somers et al., 2000; Inman & Mayes, 1999; Bui, 2002), be female (Inman & Mayes, 1999; Bui, 2002), be older (Inman & Mayes, 1999; Somers et. al., 2000), and be a student of color (Inman & Mayes, 1999; Bui, 2002). The literature also found first-generation students to be more likely to score in the lowest quartile on the ACT or SAT (Penrose, 2002; Riehl, 1994; Hahs-Vaughn, 2004; Bui, 2002) and be decided on a major (Terenzini et. al., 1996). The literature review showed that first-generation students report less encouragement from family to attend college (Terenzini et. al., 1996).

This study also found first-generation students to be more likely to come from low income families and to be female. But this study did not find a statistically significant difference between first-generation and continuing-generation students in age or race. The lack of difference between first-generation and continuing-generation students in terms of age and race in this study could be due to the small population of non-traditionally aged students and students of color at the study institution. This study found

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first-generation students to have a lower overall average ACT composite score than continuing-generation, but did not find a statistically significant difference in how decided students are on a major.

This study found differences between first-generation and continuing-generation students in their motivations to attend college. This study found statistically significant differences in the following motivations to attend college: because your parents wanted you to go, to make more money and to get specific career training. Continuing-generation generation students reported more importance for the variable because your parents wanted you to go. First-generation students were more likely to indicate these motivations to attend college as very important or moderately important. This study did not find statistically significant differences in the other motivations to attend college questions.

The largest differences in results between first-generation and continuing-generation students was found in pre-college traits as opposed to within-college experiences and learning outcomes. Although some of the differences were statistically significant, the differences were quite small. For example, the difference in ACT score between first-generation and continuing-generation students is statistically significant but the difference is not large. First-generation students average a 22.1 composite ACT score, whereas continuing-generation students had an average of 22.8, on a 36 point scale, this is not a large difference.

Research Question #2

Do first-generation and continuing-generation college students differ in terms of their college experience? Research question #2 explored the institutional context as portrayed in Terenzini et al.'s (1996) conceptual framework. Institutional context included students' coursework and curriculum patterns, in-class experience, and out-of-class experience. A large number of variables were analyzed in the previous literature to measure institutional context. This study compared first-generation and continuing-generation students' in-class experience and overall institutional context on 28 variables such as "I want professors to know my name" and "I can make life-long friends here." This study also compared the number of hours spent working, the number of hours spent studying, the number of weekends spent on campus, and club participation frequency to measure out-of-class experience.

This study supported what was reported in the literature, that first-generation students were more likely to work more hours off campus, (Terenzini et. al., 1996; Pascarella et. al., 2004; Billson & Terry, 1982) and live off campus or commute (Pascarella et. al., 2004; Billson & Terry, 1982). This study found that first-generation students were less likely to report that they participate in class and they are more likely to go home on the weekends. This study did not find statistically significant differences in 23 of the 28 in-class and institutional context variables. The in-class variables with a statistically significant difference were "I am a participant in class discussions," " I want professors to know my name," " I am willing to get to know other students in my classes," " I practice oral presentations out loud before I deliver them in class," and "I am

known as an individual here." First-generation students were less likely to want professors to know their name, less willing to get to know their classmates, less likely to practice oral presentations out loud, and less likely to feel like they are known as individuals. This study did not find a statistically significant difference in the number of hours spent studying or in the frequency of academic or social club participation.

Although this study did find statistically significant differences in five of the 28 institutional context variables, first-generation and continuing-generation students seemed to be experiencing the campus similarly. There were more similarities than differences across the variables, and the differences were not large. The similarities may be due, in part, to the homogenous population at the study institution. A majority of the students at the study institution are white, traditional aged students with an even mix of male and female students.

This study is unique and adds to the body of knowledge on first-generation college students' academic experiences, preferences, and classroom behaviors. This study was able to explore these specific academic experiences such as "I am a participant in class discussion," "I want professors to know my name," "I am willing to get to know others students in my class," and "I practice oral presentations out loud before I deliver them in class etc." The literature review did not find any other single institution studies that asked students questions about their academic experience in great detail. Exploring these variables at other institutions may have very different findings. The lack of difference at the study institution on these variables indicates that first-generation and continuing-generation students are experiencing the institution similarly.

Research Question #3

Do first-generation students and continuing-generation students differ in terms of learning outcomes? Two variables were used to measure learning outcomes: cumulative grade point average and CAAP sub scores. Learning outcomes are not consistently measured in the literature. Although the literature includes many different learning outcomes variables, retention and graduation rates are commonly discussed and hypothesized in the literature. Riehl (1994), Inman and Mayes (1999), and Penrose (2002) found that first-generation students are less likely to be retained than continuing-generation students.

This study found statistically significant differences between first-generation students and continuing-generation students in cumulative grade point average and the writing sub score of the CAAP exam. No statistically significant differences were found on the math, reading, critical thinking, and science sections of the CAAP exam. First-generation students were more likely to have a lower cumulative grade point average, and were more likely to have a lower score on the writing section of the CAAP exam than continuing-generation college students. Although the GPA difference between first-generation and continuing-generation students is statistically significant the difference is not extreme. The average cumulative GPA for first-generation students is 2.83 and the average cumulative GPA for continuing-generation students is a 2.91. CAAP exam results are also more similar than they are different.

This study found lower first-year retention rates and lower four-year graduation rates for first generation students than for continuing-generation students. The average

first to second retention rate over the years 2000-2008 for first-generation students was 72.18, whereas the same statistic for continuing-generation students was 75.91. Although the difference appears to be small, lower retention rates for first-generation students is still an issue the study institution could address to improve overall enrollment and campus-wide retention and graduation rates.

Conclusion

Terenzini et al. (1996) hypothesized a causal sequence that follows the college-going experience or pipeline starting with pre-college traits, within college experience, and learning outcomes. This study found statistically significant differences in at least one variable for every stage in the model. The most impactful differences were found in pre-college traits, out-of-class experiences, and learning outcomes. There are five variables with a statistically significant difference among in-class experience variables. This study found that, at the study institution first-generation and continuing-generation students enter college with different pre-college traits, spend their time outside of class somewhat differently, and differ slightly in learning outcomes.

First-generation students enter this college at a slight disadvantage. First-generation students were more likely to be female and low income, two populations that have historically been identified as at-risk of stopping out of school. First-generation students have a lower average ACT composite score. The lower ACT composite scores are evidence that first-generation students are somewhat less academically prepared for college. First-generation and continuing-generation students report slightly different motivations to attend college.

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First-generation students at the study institution are less likely to participate in class discussions, to want professors to know their name, to be willing to get to know classmates, to practice oral presentations out loud and less likely to feel like an individual. Based on these findings it seems that first-generation are less engaged in the classroom experience than continuing-generation students. First-generation students appear to be less connected to campus. They reported working more hours off campus and they were more likely to either commute or go home on the weekends.

First-generation and continuing-generation students were experiencing somewhat different learning outcomes at the study institution. First-generation students have a lower average cumulative grade point average as well as lower scores on the writing section of the CAAP exam. First-generation students at the study institution are less likely to be retained after one year and less likely to graduate in four years than continuing-generation students. The cumulative GPA and CAAP exam scores are only slightly different. Although statistically significant these slight differences may not negatively impact a student's future. Stopping out of college and never earning a bachelor's degree may have a much larger impact on a student's future. Improving the retention and graduate rates for first-generation students will have a positive impact on the study institution's enrollment, as well as have a positive impact on the lives of the students who graduate.

A regression analysis using cumulative GPA as the dependent variable and gender, ACT, parent income, and first-generation or continuing-generation student status as the independent variables showed that although statistically significant the impact on

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GPA is actually small (r square = .1097). First-generation status and female gender variable have a negative effect on GPA whereas ACT composite score has positive effect on GPA. Parent income was not statistically significant. Results of the regression analysis support the findings of the other analyses in terms of finding that differences are small.

Implications and Recommendations

The study institution is a popular university and continues to increase admission criteria in order to limit the new entering class size. Doing so may limit access for first-generation students. In order to maintain access for first-generation students the study institution may want to review their admission practices and consider a more holistic process.

In order to improve retention and graduation rates university-wide, the study institution could focus retention efforts on first-generation students and their parents. The study institution could set a goal to help first-generation students increase their cumulative grade point average and become more connected to campus through academic assistance and financial assistance which is available to students on campus. The study institution could also develop a communication plan with parents to make them aware of the services available on campus for their students.

First-generation students scored lower on the CAAP writing exam than continuing-generation students. These lower writing scores are an indication of poorly developed writing skills among first-generation students. The study institution could

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implement programs to improve the writing skills of first-generation students, as well as communicate these programs to parents of first-generation students.

This study tried to determine whether or when controlling for other pre-college traits, generation status still has an impact on GPA. The pre-college traits explored were gender, ACT, generation status, and parent income. Although gender, ACT, and first-generation or continuing-generation status are statistically significant predictors of GPA, the variance in GPA that can be attributed to these factors is only 11%. Eighty-nine percent of variance in GPA depends on other factors. Basing admission decisions or creating assistance programs that focus solely on ACT, gender, or first-generation student status is not recommended due to small variance in GPA that can attributed to these factors.

Parental income was no longer a statistically significant variable in the regression analysis, but there was a bell-shaped curve correlation between GPA and parent income. Parent income was student reported in this study. Student reported parent income is not accurate, future research could be more accurate if student financial aid records are accessed.

This study also explored students' motivations to attend college but did not explore their motivation and desire to do well in college and succeed in college. A comparison of determination and desire to do well in college between first-generation and continuing-generation students could also be explored in future research. Qualitative analysis of student interviews could offer additional comparisons between first-

generation and continuing-generation students in terms of their within college experiences and decision making, as well as their desire to do well in college.

Although much of the literature and results of the present study have found difference between the two groups of students, the that differences tend to be relatively small suggests a cautionary note about developing programs that are targeted at first-generation students. First-generation students should not be targeted in ways that further their potential sense of marginalization and disconnection with the higher education experience due to the fact that they are the first in their families to attend college. Rather, first-generation students should be strongly encouraged to participate in those programs and special services that are available to all students in campus.

Another unexplored topic in the literature concerns the experiences of first-generation college students as they graduate college and enter the world of work or continue their academic experiences by enrolling in graduate or professional programs. As a first step in this area of inquiry, initial studies should be conducted to compare first-generation and continuing-generation students at the point of completing a baccalaureate degree. Since the choices of majors of first-generation and continuing-generation students are likely to differ due to reported differences in likely majors of the two groups of students. The next question then would ask "Are first-generation students as well prepared as continuing-generation students to succeed in the next stage of their education?"

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