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## Exploring the Effect of a Non-Residential Learning Community on Academic Achievement and Institutional Persistence

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THE FLORIDA STATE UNIVERSITY  
COLLEGE OF EDUCATION

EXPLORING THE EFFECT OF A NON-RESIDENTIAL LEARNING COMMUNITY ON  
ACADEMIC ACHIEVEMENT AND INSTITUTIONAL PERSISTENCE

By

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For Mom and Dad.

Thank you for all your encouragement and love.

Without your support and faith this would never have been possible.

This degree belongs to you; we are officially done.

For Lindsay.

You taught me to believe in myself and to laugh.

You are always good for a kick in the butt when needed. Thank you.

For my students.

You inspire me and are my passion.

I can't wait to see you live your dreams. Bring the ship in.

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## ABSTRACT

The purpose of this study was to examine what effect the Freshmen Interest Group (FIG) program, a variation of a non-residential learning community had on academic achievement scores and institutional rates of persistence. Study variables included: gender; race; pre-collegiate academic achievement (GPA scores); educational preferences (major choice); enrollment status, and cumulative grade point average scores, and participation in the FIG program. Regression analysis showed that FIG program had a statistically significant positive effect on the mean GPA scores of participants but no significant effect on the rate of institutional persistence.

Examining how student gender, race, pre-collegiate achievement, and educational preference interacted with the effect the FIG program had on academic achievement, regression analysis showed that female FIG participants had lower statistically significant achievement scores than male FIG participants, but when analysis was conducted for the full study sample females had higher achievement scores than males.

In terms of institutional persistence the analysis of the control variables found that Black identifying students in the sample had statistically significantly high rates of persistence compared to peers, but Black identifying FIG participants had a statistically significantly lower rate of persistence compared to peers participating in the FIG program from other race groups. Students who elected to enroll in a STEM (science, technology, engineering, or mathematics) curriculum area statistically had significantly lower rates of persistence compared to non-STEM students.

The study's findings showed that the FIG program was an effective intervention to change the direction of the statistical effect to a higher persistence rate than that found for non-STEM students. The FIG program was shown to be a possible means by which to improve the academic achievement and institutional persistence of college students. Because the results vary, in direction and intensity, for students based on some socio-demographic and educational preference variables, policy makers are encouraged to conduct more research and proceed with caution before using a non-residential learning community like the FIG as an universal means by which to increase educational effectiveness.

## **CHAPTER ONE**

American higher education has been shaped by stringent government and consumer demands for accountability since the early 1990s (Burke, 1998). These demands were born out of growing questions about the benefits of certain educational outcomes in light of decreasing availability of public funding for state institutions (Bevc & Ursic, 2008; Eaton, 1995). Furthermore, if policy trends witnessed in K-12 education are a predictor of future accountability standards in higher education, funding that is already limited will become even more tightly connected to perceived efficiency and effectiveness measures as indicated by student retention, academic achievement, and standards of overall institutional performance (Bevc & Ursic; Wawrzynski & Jessup-Anger, 2010).

As competition for federal and state subsidies has increased, institutions need to recruit larger numbers of qualified students and garner greater public trust has prompted them to develop strategies to improve the value of the enterprise and meet performance indicators required by accrediting bodies and institutional funding formulas. Retention rates, time-to-degree completion rates, and grade point averages are traditional criteria used to measure student performance, and therefore institutional effectiveness.

Campus programs that support students' personal and academic development contribute to the likelihood of academic success and institutional persistence (Borden, 1999; Pike, Kuh, & McCormick, 2011). At a large, research university in the Southeastern U.S., one such strategy implemented to improve these performance indicators was the Freshmen Interest Group program (FIG). Initiated in 2005, a FIG is a non-residential learning community program that assists first-year, first-time-in-college students to make an effective academic transition to the university. The mission of the FIG program is to "assist students in their initial selection of liberal arts courses; finding courses that carry a common thread of interest; and the development of small support cohorts of like-minded peers" (BDU, 2007). Through a colloquium taught by an upper-division student, sections of linked liberal arts courses, and a cohort of peers, it is the intent of the FIG program to "foster inquisitive thought and develop the mind as an instrument of analysis" (BDU, 2007).

### **Purpose of the Study**

This study examined the FIG program as a means of improving the effectiveness of undergraduate education. For the purposes of this inquiry, effectiveness was gauged by performance indicators commonly used to denote educational quality, namely the impact of the FIG program on student academic performance and institutional persistence. The effectiveness of academic enrichment programs in undergraduate education has been evaluated with various types of data, including student perceptions and attitudes, analysis of educational costs in relation to perceived value, the ratio of courses dropped to those completed, future course registrations, grade point averages, and student retention and persistence rates (Gordon & Hopkins, 1996; Rocconi, 2011).

As part of the attempt to improve student academic achievement and persistence, many institutions have developed first-year student support and academic enrichment programs (Pascarella & Terenzini, 1991; Smith & MacGregor, 2009). A considerable body of research indicates that the various forms of student involvement, both inside and outside of the classroom, have a substantial and positive effect on student academic development and higher education persistence (Astin, 1975, 1993; Pascarella & Terenzini, 1991; Smith & MacGregor, 2009).

Astin (1993) stated that, “Overall educational effectiveness can be ascertained by the amount of physical and psychological energy a student contributes towards his/her involvement in the college experience” (p. 365). The greater a student’s involvement, in both quantity and quality, with various aspects of the collegiate experience, academic and co-curricular, the greater the chances are that the student will achieve his/her educational goals and be satisfied with the educational experience, leading to a higher degree of academic achievement and increased likelihood of institutional persistence.

Non-residential learning communities, like the FIG program, are designed to encourage the type of campus engagement Astin (1993) described. In particular, the FIG program encourages student interaction with peers, faculty, and staff in the college environment, the development of healthy study skills, co-curricular involvement, and academic engagement. This study examined what effect, if any, the FIG program has had on specific institutional performance indicators, student academic achievement and institutional persistence. By measuring these indicators for students who participate in the FIG program and those who do

not, policy decisions can be made regarding how to leverage the FIG program improved the effectiveness of undergraduate education.

### **Research Questions**

The research questions which guided this study are listed below. Operational definitions follow the questions.

- What differences exist, if any, in the academic achievement and institutional persistence of students who participated in the BDU's FIG program and students who did not participate in the program?
- If there are differences in academic achievement or institutional persistence between students who participated in BDU's FIG program and those students who did not, do the differences vary based on gender or race?
- If there are differences in academic achievement or institutional persistence between students who participated in BDU's FIG program and those who did not, do the differences vary based on pre-collegiate academic achievement?
- If there are differences in academic achievement or institutional persistence between students who participate in BDU's FIG program and those students who did not, do the differences vary based on educational preference (major choice)?

This study was based on data from first time in college (FTIC) students who matriculated at BDU during the Fall 2005 and Fall 2006 semesters.

### **Definition of Terms**

The following operational definitions informed this study:

- *Non-residential learning community.* The Freshmen Interest Group (FIG) program at Big Dog University (BDU) is a non-residential learning community. Students do not live in a common residence hall as in some other programs. A FIG is a pre-packaged cluster of four or five high-demand freshman courses and weekly colloquia that are linked by themes and/or academic programs and directed by faculty from academic departments and/or programs. Each cluster is limited to 25 to 30 students based on specific courses included in that cluster and program popularity during a particular year. FIG colloquia are lead by current upper-class, undergraduate students serving as peer leaders.

- *Freshmen Interest Group (FIG) program:* The Freshmen Interest Group (FIG) program at Big Dog University (BDU) is an optional one credit colloquium seminar course. It is coupled with two or three academic classes. These courses are linked by an academic, co-curricular, or interest theme. The program includes on-campus and off-campus programming and other interventions designed to develop a social and learning community for up to 30 FTIC students.
- *First-time-in-college (FTIC) students.* FTIC students are typically 17 to 21 years old who graduated from high school within the last year. They matriculate at full-time students working towards a bachelor's degree at BDU with fewer than 30 hours of college credit. Transfer students are not included.
- *Academic Achievement.* Academic achievement was measured by the students' cumulative non-weighted institutional grade point averages (GPA) on a 4.0 scale. Literature supports the interchangeable use of academic achievement and academic performance; the grade point average serves as an easily accessible and measurable way to compare student academic achievement (Borden, Burton, & Evenbeck, 1999).
- *Institutional Persistence.* Persistence refers to student re-enrollment at an institution for subsequent semesters. More specifically, this study defined the persistence rate as the percentage of students who initially enrolled at BDU in Fall 2005 or 2006 who remained enrolled at the same institution through their second, fourth, fifth and seventh semesters, excluding summers.
- *Minority Student.* Based on BDU's admissions reporting categories, minority students were defined as those who have self-identified as non-Caucasian; which included Black, Asian, American Indian or Native Alaskan, Hispanic, and Native Hawaiian.
- *Non-STEM (science, technology, engineering, and mathematics) majors.* This term refers to majors declared by FTIC students in the following academic colleges/majors at BDU:
  - Arts and Sciences - excluding biology, biochemistry, chemistry, computer science, mathematics, meteorology, physics, and statistics
  - Business
  - Communication and Information - excluding information technology

- Criminology and Criminal Justice
- Education
- Human Sciences
- Motion Picture, Television and Recording Arts
- Music
- Social Sciences and Public Policy
- Social Work
- Visual Arts, Theatre, and Dance
- *STEM (science, technology, engineering, and mathematics) majors*. This term refers to majors declared by FTIC students in the following academic colleges/majors at BDU:
  - Arts and Sciences - biology, biochemistry, chemistry, computer science, mathematics, meteorology, physics, and statistics
  - Communication and Information - information technology
  - Engineering
  - Nursing

### **Methodological Framework**

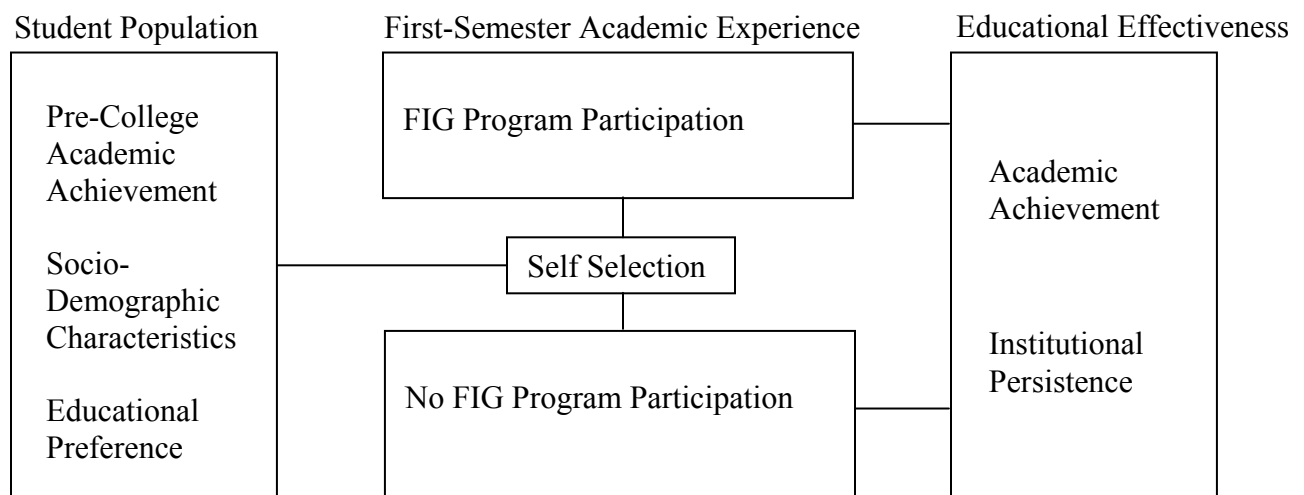
To understand what influence student participation in a non-residential learning community during the first semester of a college has on student success beyond the first year, two constructs typically measured, student and institutional performance indicators were examined in the study. The first construct measured for students was grade point average. Grade point averages were used as an indicator of gained knowledge because they are relatively easy to obtain, easily comparable, standardized within a single institution, and a measurable means of determining the degree of student academic success.

Students at Big Dog University are assigned grades on a 4.0 non-weighted grading scale. The cumulative institution only grade point averages for students involved in this study were recorded at the conclusion of their first, second, fourth, fifth, and seventh semesters, excluding summers, of college enrollment.

The second construct measured for students included in the study was the rate of full-time, continuous persistence at the institution. The rate of institutional persistence was

determined by recording the percentage of students, both participants and non-participants in a non-residential learning community, who maintained continuous enrollment at Big Dog University across five semester; omitting summers. Using institutional enrollment data, the percentage of students from the non-residential learning community participant group and the non-participant group were analyzed at the conclusion of the second, fourth, fifth, and seventh semesters, excluding summers. The study also computed the rates of subject persistence.

Non-residential learning communities are designed to encourage student campus engagement; which contributes towards the quantity and quality of learning (Astin, 1985; Morck, 2010; Smith & MacGregor, 2009). The FIG program encourages student interaction with peers, faculty, and staff in the college environment, the development of healthy study skills, co-curricular involvement, and academic engagement. This study examined what influence, if any, the FIG program has on specific institutional performance indicators, student academic achievement and institutional persistence. By measuring these indicators for students who participated in the FIG program and those who did not, it was better understood what influence, if any; the program has had on the effectiveness of undergraduate education. This study is represented through the following illustration of the conceptual framework.



**Figure 1.1 Methodological Framework of Study**

### **Significance of the Study**

This study examined the FIG program at Big Dog University (BDU) and contributes towards understanding what effect, if any; the program has on the effectiveness of undergraduate education. Although BDU is a large research institution, over 40,000 total student enrollment, the findings of this study may also benefit administrators at undergraduate-serving institutions who wish to understand the effect non-residential learning communities can have on the effectiveness of undergraduate education as measured by student academic achievement and institutional persistence. The study also informs future evaluation, modification, and implementation of the FIG program.

### **Assumptions of the Study**

The following assumptions were made at the outset of this study:

- Each FIG colloquium was generally the same, although sections varied slightly in terms of specific activities, the order of content, and focus of the FIG based on the preference of the instructor and the emphases of individual FIGs.
- All upper-class students who served as peer leaders met all expectations and requirements to teach the course, including selection from a competitive application/selection process and successful completion of a required training course (HUM4924).
- Grade point averages (GPAs) for the students included in the study accurately represent their academic achievement at BDU.

### **Limitations of the Study**

There were several limitations to this study:

- The FIG program was optional for first-year students at BDU; students self-selected into the program and could likewise leave the program at any point. This created a “volunteer effect”, which assumed that students who participated in the program were more motivated than students who did not participate. The volunteer effect could influence the study’s outcomes if FIG participants were not representative of the total first-year student population.
- Confounding variables may have positively and/or negatively influenced the college experience of students both participating and not participating in the FIG program. Some



of these variables may have included personal or family dynamics, living situations, co-curricular campus involvement, participation in additional academic enrichment programs, and time spent on study/coursework outside of class. Such variables could not be controlled for in the research design, and thus may have had some effect on students' academic performance and persistence.

- When students completed their undergraduate admissions application, they self-reported race/ethnicity with standard categories, including “Multi-Race/Ethnic” or “Non-Reported”. The “Multi-Race/Ethnic” or “Non-Reported” categories may confound full understanding about what differences exist in academic achievement and persistence between students who participated in BDU’s FIG program based on race if a disproportionate number of students from one or more racial/ethnic group fell into either of those categories.
- Because the study was conducted using data from one program at one institution, the study’s findings have issues related to external validity. Given that all of participants (treatment and control) are students at BDU with shared educational experiences during their first two years of college, it is not possible to generalize the findings of this study to students who cannot be similarly described as first-time in college (FTIC) undergraduates attending BDU.

### **Delimitations of the Study**

The following delimitations were made at the outset of the study:

- The study was intentionally limited to FTIC students who matriculated at BDU during the Fall 2005 and 2006. This limitation increased the management of the data set by limiting the scope of the study’s cases without harming the validity of the study’s findings since the number of students who participated in the FIG program and those who did not participate in the FIG program remained large enough for statistical comparisons to be made. Maturation did not affect the outcome of the study since data from both treatment and control subjects was obtained at the same points of time in the collegiate experience.

- FTIC students matriculating to BDU during Summer 2005 and 2006 were purposely eliminated from the study, even though they qualified for participation in the FIG program during the Fall 2005 or 2006 semesters respectively. This measure was taken because the majority of FTIC students who matriculate during summer terms are admitted through special remediation or academic support programs or due to deficiencies in their prior academic performance. Because these students may have been academically under-prepared, based on BDU admissions criteria, by comparison to students who matriculated in the fall semester they were not included in the study.
- The study was intentionally limited to one campus to limit the effects of confounding variables which may have negatively or positively impacted the study's findings (i.e. differences in campus climate, variations in student support resources, differences in undergraduate curriculum, and variations in FIG program goals, instructor training, or implementation).

### **Summary**

This study reviews higher education literature focusing on student attrition, engagement, academic achievement, and persistence, and examines the use of the FIG program as a means of improving the effectiveness of undergraduate education. The first chapter provides the rationale for this study in addition to the research problem and related concepts. The second chapter reviews literature related to FIG programs, academic achievement, and persistence in the field of higher education and provides a conceptual model for a study of academic achievement and persistence in non-residential learning communities. The third chapter describes the data, population and samples, statistical methods, and hypotheses for this study. The fourth chapter presents the study's findings and discusses the findings against the research hypotheses and related FIG program, academic achievement and persistence literature. The fifth and final chapter presents the study's conclusions and recommendations for higher education policy makers and researchers.

## **CHAPTER TWO**

### **REVIEW OF LITERATURE**

This chapter discusses key studies that support the positive impact student engagement has on academic achievement and institutional persistence as well as the use of learning communities in undergraduate education as a catalyst for desired cognitive and affective outcomes. The chapter also reviews the theoretical foundations that support this relationship and the literature related to earlier research conducted on student engagement, academic performance, institutional persistence, and learning communities. Additional attention was also given to the interaction student gender, race, pre-collegiate achievement, and educational preference (major choice) has on the academic achievement and institutional persistence of students.

#### **Theoretical Framework**

Vincent Tinto's (1975; 1987) Student Integration Model of Attrition offers a longitudinal model for understanding all the aspects and processes that influence a student's decision to leave college, and how these processes interact to ultimately produce attrition. Tinto's theory, based on Durkheim's theory of suicide, proposed that student departure from college was often the result of the student's inability to integrate into the formal and informal academic and social community at the institution. Inability to integrate may be the result of a student's lack of commitment towards the chosen educational goal, lack of commitment to the institution, or absence of effective institutional interventions which promote persistence (Tinto, 1975; 1987).

Astin (1993), Tinto (1987), Pike, Kuh, and McCormick (2011) have contributed research which asserts that an important link exists between academic and social integration, sometimes referred to as engagement or involvement, and the quality of student learning and persistence towards an educational goal. Astin (1993) wrote, "Learning, academic performance, and retention are positively associated with academic involvement, involvement with faculty, and involvement with student peer groups" (p.394). Researchers studying student engagement have confirmed through the use of empirical studies, across diverse settings and conditions, that the more frequently students engage with faculty, staff, and peers, the more likely, with all other things being equal, they will excel academically and persist until graduation (Tinto 1987; Astin,

1993). As a result of this data, institutions strive to provide learning and living environments that contribute to academic and social student engagement.

One strategy implemented by institutions to achieve performance indicators through an engaging educational environment includes the development of non-residential learning communities, like the Freshmen Interest Group (FIG) program. This chapter provides a survey of the philosophical discussion regarding outcomes associated with higher education, the development and characteristics of learning communities, and key literature regarding student academic achievement, and institutional persistence.

### **Higher Education Outcomes**

Higher education outcomes can be broadly defined and their measurement is dependent on the weight of personal and societal values. Outcomes may be identified via an individual perspective if noted in the intrinsic personal development achieved by a student during his or her educational experience or tangible increases measured in a participant's earning potential or employment opportunities over time, often following as a result of participation (St. John, 2003). In terms of a societal perspective, higher education outcomes may be measured by listing the economic and non-economic benefits transferred to society as a result of citizen participation. Literature shows that as participation in higher education increases, there is less reliance on government programs, increased tax revenues, and higher civic engagement (Bowen, 1977; Institute for Higher Education Policy, 1998).

In *Reaping the Benefits: Defining the Public and Private Value of Going to College*, a report by The Institute for Higher Education Policy (1998), higher education outcomes were outlined in four categories: private economic, private social (non-economic), public economic, and public social (non-economic). While some outcomes are tangible, thereby measurable and more easily understood by consumers, others benefits are more intrinsic and gained over the long-term. Just as all the costs associated with higher education funding may not be viewed as legitimate or central to the mission by educational outsiders, so too many of the outcomes derived from participation may not be valued on first glance by educational policy maker. To help understand higher education outcomes, St. John (2003) suggests that they be thought of as benefits; sometimes not realizable until many years after participation.

The private economic outcomes, or benefits, associated with higher education are those best understood by those outside academia, especially by constituents who do not weigh the benefits and costs of education like institutional policy makers. Empirical evidence found in the literature shows that people who participate in higher education have higher earning potential (salaries) and increased opportunities for employment flexibility and benefits in both the short and long term (Institute for Higher Education Policy, 1998; St. John, 2003). Students who attend college but do not persist to degree completion have slightly increased opportunities for savings, earning, and job flexibility over those who do not attend any amount of higher education. The opportunity gap is greatest between college graduates and those who choose not to ever enroll in higher education (St. John, 2003).

While private social or non-economic outcomes may not be viewed as motivators for higher education participation to the same degree that economic benefits are, they do provide status and quality of life benefits that are measurable. Empirical data shows that college participants have improved health and longer life expectancies than those who do not participate in higher education. This difference is largely due to greater economic means and obtainable benefits through increased job opportunities and employment flexibility (Institute for Higher Education Policy, 1998). The economic benefits earned by a college graduate similarly transfer non-economic quality of life benefits to the dependents of those college graduates. Personal status is also likely to increase based on attainment of a college degree or associated titles and positions earned through improved employment opportunities. Higher earning positions also provide more expendable income for leisure activities, personal development, and time away from work (Institute for Higher Education Policy, 1998).

Educational outcomes benefiting individuals eventually become societal benefits. As the earning potential of individuals increases it is reasonable to assume that public tax revenues will increase and standards of living will rise. A relationship exists between the level of educational obtainment in a community and the level of the tax base, consumer spending, and opportunities for work flexibility in that community (Institute for Higher Education Policy, 1998). As the average salary in a community increases, the result therefore should be that fewer citizens will be dependent upon government programs (Institute for Higher Education Policy, 1998).

As individuals gain social benefits from their higher education participation, these benefits will also scale up to become public benefits. As participants are exposed to a variety of diverse experiences and ideas during their college experience, their level of civic engagement and a sense of responsibility for issues affecting the greater good have been proven to increase (Institute for Higher Education Policy, 1998). Results from this effort include reduced crime rates and increases in community service participation and charitable giving. At the same time, society becomes more adapt to social and technological changes and citizens show a greater appreciation for diverse ideas and cultures (Howard, 1977).

While some higher education outcomes are more tangible and immediate, others offer intrinsic long-term benefit to society. Some of these benefits provide stronger motivation for participation because of the direct rewards gained by the consumer, but society's economic and non-economic benefits should not be downplayed individuals or academy (Howard, 1977). Because of the returns gained by individuals and the greater societal good, in addition to the institutional funding benefits associated with improved outcome, or quality, measures, higher education policy makers have an undeniable interest in the promotion of improved student academic achievement and institutional persistence.

### **Learning Communities**

*Historical Development of Learning Communities.* A sense of community can provide significant influence towards helping students feel more satisfied and successful in their (college) environment (Sommers, 1998). Alexander Astin (1985) stated that, "Quality should be defined more by student action than attitude" (p. 212). One of the most important steps that colleges and universities can take towards becoming learning centered organizations is to reorganize their educational activities to encourage shared, connected learning experience (Tinto et al., 1993). There are two dominant paradigms used to create interconnected learning communities for undergraduate education in America: the living-learning community and first-year seminar/experience course (Borden, 1999).

Living-learning communities are defined as residential situations designed to promote students' overall growth and development (Hammer, 2003; Pike, Kuh, & McCormick, 2011). In addition to residing in close-knit supportive communities, participants may also have opportunity

to closely interact with faculty members, to take courses in their residence hall, or to interact with peers who share common occupational, academic, or co-curricular interests; all while developing a sense of community (Hammer, 2003). The other commonly used strategy for purposely increasing first-year retention with community building is the freshman/first-year seminar or course, which provides students with an introduction to the campus, strategies for relating to the institution's academic community, an academic fundamentals curriculum in small group settings, and the development of peer support networks (Cartney, 2006; Rocconi, 2011).

New trends in the development of non-residential learning communities during the last ten years have shown promise in the further development of engaging student learning environments, which promote academic success. Non-residential communities often link small course sections focused on a targeted curriculum area with interventions designed to support social or learning networks without regard to funding or space limitations common to communities dependant on a common residential experiences. Non-residential learning communities can be organized in an endless number of configurations based on institution resources, student needs, and program goals. In their most basic configuration, the learning community will include some type of block academic schedule that enables student to take courses together (Tinto, Goodsell, & Russo, 1993). The same students will register for the same two or more courses, in theory developing an academic support cohort.

Non-residential learning communities are based around shared student course enrollment and academic experiences, not a common residential experience. There are often supplemental initiatives developed to address the holistic development of the student in addition to academic success. Students belonging to a community may or may not live in the same or similar residential setting. In terms of shared courses, students in these learning communities will sometimes share their entire first-semester curriculum, thereby learning the same material simultaneously. In other community configurations, students are linked to each other by two or three shared courses; typically a literature or writing course connected to one in an area of history, social science, or physical science (Tinto, Goodsell, & Russo, 1993).

Non-residential learning communities at larger institutions might have 200-300 students enrolled in a single large lecture class in addition to a smaller accompanying discussion section

that is led by a graduate or upper-division student (Gahlenick et al., 1990). In another variation, students in an academic program might take all their courses together during common blocks of time across the institution. This model allows the entire student community to gather for four or five hours at a time, but less frequently during the course of the academic semester or quarter (Gahlenick et al., 1990). Learning communities that are purposely formed to promote student interaction and social learning opportunities for students and faculty, are sometimes not obvious to the participants because they are established across a variety of avenues that feel both natural and effortless (Morck, 2010; Schroeder, 1994).

Literature in this area notes that learning communities based on shared curriculums and academic experiences first emerged at smaller liberal arts institutions and those with unique curriculums or distinct missions. This is likely because these schools more often than not serve students who share closely defined common interests and academic structures at those institutions promote collaboration and cross-curriculum learning (Schroeder, 1994). Research supports that student persistence in college depends on a number of factors, both student and institutional related (Wilcox, 2005). Unshackling student support initiatives that focus on academic readiness and the development of success strategies from residence halls in a way that offers opportunities to foster social and support networks shows great promise (Wilcox, 2005).

*Elements of Learning Communities.* What constitutes a living-learning community or center varies from institution to institution based on definitions, facilities, and formal or informal programming for students that supports their engagement in community. Schroeder (1994) generalized the definition of living-learning communities to four criteria that should be central in their purpose and the measurement of success: involvement, influence, investment, and identity. Based on this definition, true living-learning communities encourage, expect, and reward broad-based member involvement. The environment naturally fosters a high degree of student interaction that requires members take on multiple roles and responsibilities based on intrinsic reward. As a consequence of involvement, everyone is important and everyone is needed (Schroeder, 1994).

In living-learning environments where communities exhibit a high degree of influence over their members, control is vested in members, and the students exert maximum control over



their physical and social environments (Schroeder, 1994). This phenomenon of influence may include the personalization of space, recruitment of new members, and authority to induct or remove members into or out of the community based on self-developed criteria. Additionally, expectations may dictate that formal or informal social contracts are developed to affirm group standards. Schroeder (1994) notes that in living-learning environments with high degrees of influence, the members feel important, that their perspective is valued, and individual contributions are essential to the welfare of the group.

Schroeder's (1994) definition of living-learning community characteristics stated that investment in the environment is a reflection of psychological ownership and flows naturally from increased involvement and influences. When engaged in the community, participants care about each other, the group, and the physical space which connects them. Interactions are often characterized by gentle confrontation rather than polite or passive-aggressive behaviors (Schroeder, 1994). It is also asserted that there is longevity of association and rewards provided for "good" membership or stewardship of community values (Schroeder, 1994).

Finally, the characteristic of identity means that those engaged in purposeful living-learning communities focus on commonalities and transcendent values (Schroeder, 1994). These transcendent values may be displayed with the presence of shared symbols, speech, and patterns of decision-making and common behavior. Members in groups possessing highly developed sense of identity would also define themselves in terms of "we" and "us", not "I" or "they", thereby reinforcing emphasis on common purposes, unity, and the collective (Schroeder, 1994). The value of these four community characteristics in support of personal and academic development is apparent beyond their specific residential application, if consideration is given to what might also characterize other in and out of classroom learning centered environments that support holistic student development.

*Research on Learning Communities.* Empirical evidence shows that living-learning communities that focus on student involvement, academic engagement, and community development can have a significant impact on academic achievement and college persistence (Astin, 1993, Pascarella, 1985; Pascarella & Terenzini, 1999). Achieving the goals of involvement, influence, investment, and identity as outlined by Schroeder can also be

transformative to community learning experiences that develop independently of residence halls, which represent the living component most commonly associated with living-learning communities.

While the amount of research conducted on non-residential learning communities is not as abundant in quantity or quality as the research focusing on residential learning communities, the existing literature does suggest that if properly developed, non-residential learning communities, can similarly support student engagement in the community over time (Astin, 1985; Baird, 1976; Pascarella & Terenzini, 1991; Pike, Kuh, McCormick, 2011; Schroeder, 1994; & Wilcox, 2005). Similar to residence based communities, a great degree of variation exists within the type, scope, and focus of non-residential learning communities take based on institutional and program missions, resources, and implementation. Additionally, student centered variations exist based on Schroeder's (1984) four criteria, involvement, influence, investment, and identity, along with cultural variations in the institutional community (Moos, 1986). The character of an environment is implicitly dependent on the typical characteristics of its members (Moos, 1986).

Research conducted by Baird (1976), Blimling, Whitt (1999), Schroeder (1984), Pascarella, Terenzini (2005); Wawrzynski and Jessup-Anger (2010) on the factors which constitute cognitive and personal development in learning communities suggest several themes common to successful learning communities regardless of location or theme. Of importance is the ability of the community to construct a sense of identity for members through which all participants recognize one another as learners, while still valuing the contributions of each individual (Schroeder, 1984). Learners within the community are neither independent nor dependent. A location and time must be established for active learning to take place, an established way for members to engage in transformative learning activities (Blimling & Whitt, 1999). For members of non-residential learning communities, this process commonly occurs in the classroom or through designated outside of the classroom events that contain learning outcomes. Learning communities should create supportive environments that safely encourage students to engage in the life of the institution; activities are designed to engage thought and encourage discussion.

Learning communities should contribute towards a seamless student experience that integrates social and academic experiences (Pascarella & Terenzini, 2005). As stated earlier, the level of integration of social and academic experiences will be integrated with each other will vary based on program goals and available resources, opportunities should be provided for students to integrate their personal interests into their academic life and likewise, take their academic work into personal and social aspects of the undergraduate experience. Non-residential learning communities in particular have the advantage of being loosely coupled to traditional learning system designs so that interdisciplinary connections can be created among multiple curriculum areas, supporting the notion that ways of knowing may be discipline specific, but knowledge and concepts are not (Morck, 2010; Schroeder, 1985). Consequently, non-residential learning communities can be very successful in providing a context for complex thinking skills. These skills may include divergent, flexible, and critical thinking, social cognition, creativity, and metacognition (Blimling & Whitt, 1999). If maximized, cross-discipline learning communities give participants opportunities to interact with curriculums at a more advanced level than simply receiving information. It fair to say however that this may be the affect of any well designed curriculum which emphasizes higher level thinking skills.

### **Demographic Variables**

A student's academic performance and persistence in college towards program completion has been a popular research topic because of the impact these performance indicators have on accreditation, reputation, and funding appropriations. Astin (1975); Kuh, Kinzie, Buckley, Bridges, Hayek (2006), Pascarella, Terenzini (2005), Tinto, and Pusser (2006) have all contributed research which discusses these variables, institutional and student, and how they contribute towards student attrition from higher education participation. While the specific factors which contribute to attrition, and the degree of influence, will vary for each student, research provides consistent information about student demographic variables which either predicts or shapes student's academic success and his or her persistence toward graduation. These socio-demographic variables commonly include gender and race/ethnicity.

*Gender.* Since the early 1970s, the undergraduate college enrollment of women has outnumbered male enrollment in the United States (U.S. Department of Education, 2001).

Although the net number of bachelor's degrees awarded to men has increased during this same period, undergraduate enrollment at most U.S. institutions about 55% female, a trend that continues to increase (King, 2002). U.S. Department of Education (2001) data reports that for every 100 men who earn a bachelor's degree, 133 women receive their degree. Mortenson (1999) contends the growing gap between degrees awarded to men and women points to a downturn in the engagement and educational attainment of male students.

Two areas of literature are relevant to understanding the relationship that may exist between gender and academic achievement and institutional persistence in the undergraduate experience. The first relevant area of the literature on this topic focuses on pre-collegiate educational preparation, the way in men and women are prepared for and encouraged to enroll in college. Without the appropriate preparation and encouragement to enroll and persist towards program completion, there is little chance of degree obtainment. The second literature area focuses on the quality of the student collegiate experience, with an emphasis on student engagement differences that exist between men and women. The concept of student engagement and its impact on educational quality and success are derived from Astin's (1984) theory of involvement.

While the breadth of research addressing the similarities and differences which exist in the educational engagement and achievement of men versus women in the college is narrow, a considerable amount of literature has been written on these topics for the K-12 level. This research illustrates some interesting differences regarding how boys and girls learn and engaged during the process of education (American Association of University Women, 1992, 1999; Berkam, Lee & Smerdon, 1997; Sax, 2005). Some of these differences are well accepted and have been documented through empirical research: boys tend to score better on standardized tests, especially those in areas of math and science (Berkam, Lee & Smerdon, 1997) and girls tend to be more motivated in education as a whole and perform better in assessments that focus on reading and writing (Sadker & Sadker, 1994).

The gap that once existed in equitable gender access to postsecondary education has also narrowed, if not completely closed, since the 1970s. Peter and Horn (2005) state, "Over the last 30 years, the 20% increase of new high school graduates enrolling in college is mostly due to the

admission of more women, lower-income students, and students of color” (p. 112). U.S. Department of Education (2004) data shows that 57% of all bachelor’s degrees in 2001-02 were earned by women, a slightly higher proportion than their representation among all enrolled undergraduate students. The six year graduation rate for women exceeds the number for men by more than 85,000 during the same period of time (U.S. Department of Education, 2004), a pattern of disproportion that exists across the board for all racial-ethnic categories. Older African-American females and Latinas are much more likely than their similarly aged men to attend college (King, 2002).

Although similar percentages of men and women high school seniors complete the traditional college preparatory curriculum and highest level of high school mathematics, men are disproportionately represented at both ends of the achievement spectrum (Mortenson, 2006, Peter & Horn, 2005) and U.S. Department of Education, 2001). Men also have lower educational aspirations (Bae et al., 2000). In part, women seem to get better grades in high school because they are more engaged in activities which promote achievement and persistence than their male counterparts; they study more hours, interact more often with their teachers, and volunteer for co-curricular educationally enriching opportunities (Kuh, 2006; Mortenson, 2006). Men, especially those belonging to race/ethnic minority groups, are least likely to complete the traditional college prep curriculum and as a result they enroll in college less motivated to read or actively take part in various aspects of campus life (King, 2002; McCarthy & Kuh, 2006). Thereby, the undergraduate grades of men in college on average tend to be significantly poorer than those of women (Gose, 1999).

On average, women are better prepared for college than men, but research regarding undergraduate perceptions of their college learning environment show that women tend to view institutions as being less supportive of both their academic and non-academic needs than males do. These negative perceptions may then in turn have negative effects on the learning and personal development success of women in higher education (Pascarella, 1985; Sandler, Silverberg, & Hall, 1996). Men and women also differ on the degree to which they participate in activities that have been shown to positively contribute towards student learning and development. On average, undergraduate women spend more time than men reading, writing,

and preparing for class during the pursuit of a bachelor's degree (Hu & Kuh, 2002, 2003). Some of these differences may be a function of major, as women tend to be overrepresented in areas that demand more writing than others, such as the humanities and social sciences compared with science, technology, engineering, and mathematics (STEM) fields. Certain of these advantages vary, depending on whether women attend a two- or a four-year college. For example, women at baccalaureate-granting colleges gain more than men in critical thinking over the course of college, whereas women attending two-year colleges tend to gain less during the first year than do men (Pascarella & Terenzini, 2005).

The educational value of student-faculty interaction is almost unequivocal (Kuh & Hu, 2001; Pascarella & Terenzini, 2005; Wawrzynski & Jessup-Anger, 2010). Frequent, meaningful interactions between students and faculty, both inside and outside the classroom, are important to learning and personal development, and a host of gains including academic skill development, social self-confidence, academic and social integration, and leadership (Astin, 1993; Pascarella & Terenzini, 2005; Smart, Feldman, & Ethington, 2000). While little of this research examines gender differences (Pascarella & Terenzini, 2005), some research has shown no difference (Kuh & Hu, 2001), while others have found that women have more frequent and positive interactions with their faculty than do men (Sax, Bryant & Harper, 2005).

Male students are less likely to seek academic assistance from tutors, perhaps because of gender-related socio-linguistic factors and cultural pressures (Wright, 2003). Yet, male students more frequently work on research projects with faculty members than female students (Drew & Work, 1998), gain more in quantitative mathematical problem-solving strategies (Baker & Jones, 1993; Halpern, 2000; Stumpf & Stanley, 1996), and report higher levels of satisfaction with digital learning environments (Blum, 1999). Even though female students tend to earn better grades in high school mathematics classes, once in college, males enroll in and complete higher level STEM courses (Davis, et al., 1996; Nelson & Rogers, 2004). Another study showed that women majoring in math and science gain more in math self-concept than men during college (Pascarella & Terenzini, 2005).

In terms of co-curricular involvement, men tend to be overrepresented in higher status campus leadership positions on coeducational campuses (Astin, 1993; Valian, 1998). Men are

also more likely to participate in intercollegiate athletics, and intramural and recreational athletics, but are less likely to study abroad (Open Doors, 2004) or take part in service learning (Campus Compact Statistics, 2006) and internships. Not all the findings from studies examining gender effects offer conclusive results. Some studies show that men more frequently participate in class discussions than females (Fassinger, 1995; Tannen, 1990), other studies found no effect (Howard, James & Taylor, 2002), while others indicate that women contribute to class more frequently (Drew & Work, 1998). Although Fritschner (2000) found no gender effect on active participation in class, gender had some influence on student fears (of professor's criticism and peer disapproval), confidence, and preparation that might affect learning in other ways including interaction with faculty and academic performance. Few, if any, significant gender differences exist in terms of self-reported educational gains in broad areas such as general education, openness to diversity, vocational training, and specialization (Drew & Work, 1998; Pascarella & Terenzini, 2005).

*Race/Ethnicity.* Jacqueline Fleming (1984) conducted a multi-year study comparing the undergraduate experiences of African American students attending predominantly White institutions with those attending historically Black colleges and universities. The study found that a discrepancy exists between the education Caucasian students receive and the education African American students receive, regardless of institutional type (Fleming, 1984). While African American students were able to develop a sense of community and receive the support they needed to develop emotionally at either type of institution, the quality of the education African American students received was not of the same quality.

Fleming's (1984) research promoted greater interest in the topic of student race and higher education achievement. One important finding to come from Fleming's (1984) study is that non-Caucasian, especially African American, students have significantly lower motivation and participation levels regarding college engagement activities which promote college success. While there has been a double digit percentage increase of minority student enrollment in post-secondary education during the 1990s, minority students are still significantly less likely to remain in college through degree completion. Those students who do graduate are less likely to do so on time (Astin, Tsui, & Avalos, 1996; Furr & Elling, 2002; Love, 1993).

Literature points to two factors which account for the discrepancy that exists between the increases in minority enrollment and under performance in student persistence and degree completion. First, minority students often have certain background characteristics which they bring with them to the college experience. The majority of this literature is based on Bourdieu's (1973) theory of cultural capital. This theory claims that non-Caucasian students are more likely to have attended under-funded urban schools, have had less access to resources and support during K-12 education, and have poorly educated guardians (Bourdieu, 1973; DeFrancesco & Gropper, 1996; DiMaggio, 1982; DiMaggio & Mohr, 1985; DiMaggio & Ostrower, 1990; Farkas, 1996; Kalmijn & Kraaykamp, 1996; Roscigno & Ainsworth-Darnell, 1999; Tinto, 1997).

Secondly, studies show that once matriculated, college and university environments are not as accommodating to the needs of minority students as they are to those of Caucasian students. What constitutes a non-accommodating environment may be perceived differently by students based on their level of college readiness and expectations about the higher education experience, but many studies believe the lack of or flexibility creates a level of discrimination or inequity, even if passive and unintentional, that has a negative effect on minority students' success (D'Augelli & Hershberger, 1993; Love, 1993; McCormack, 1995; Swim et al., 2003).

One study on this topic asked minority students attending a predominately white institution to record their daily encounters with discrimination in the college environment. The study found that students were on average encountering one incident a week which could be construed as discriminatory or non-accommodating to the needs of a minority student (Swim et al., 2003). Another study found that two-thirds of minority students reported knowing one or more minority students who have been mistreated because of their race or cultural identity (D'Augelli & Hershberger, 1993). Similar studies in the literature support the theory that if minority students encounter unsupportive or hostile college environments, they will be less likely to be academically successful and engaged.

Additionally, like female students, minority students often discover that the curriculum does not reflect the accomplishments, experiences, learning styles, or interests of minorities (Jones, 2001; McNairy, 1996). Likewise extracurricular aspects of the collegiate experience often singularly reflect the interests of Caucasian students and disregard the interests of campus



minorities, a signal that reinforces minority students not to be full engaged in the college experience; a lack of engagement that bleeds into the classroom (Fries-Britt & Turner, 2002; Littleton, 2002; McNairy, 1996).

Research shows minority students, particularly African American students, report feeling that their ideas are ignored, or that no one, including instructors, understands their perspective in classroom discussion and academic assignments (Fries-Britt & Turner, 2002). On the other end of the spectrum, minority students sometimes feel that they are singled out to always represent the minority-opinion on an issue (Fries-Britt & Turner, 2002). Minority students believe that they are treated differently than Caucasian students in their college experience by peers, instructors, and administrators. Literature shows that these differences cause a sense of alienation for minority students; alienation that hinders student engagement and institutional persistence (Fries-Britt & Turner, 2002; Gossett et al., 1996).

Minority students also report having trouble forming relationships with faculty and non-minority peers in and out of the classroom because they fear looking inadequate, mistrust white faculty, and have difficulty relating to them (Love, 1993; Jones, 2001). Literature about minority student engagement in extracurricular settings is somewhat conflicted. While there is evidence that minority students find social interaction unattractive or non-existent in the college experience and because of these beliefs, they are less likely than Caucasian students to participate in extracurricular opportunities (Fleming, 1984; Fries-Britt & Turner, 2002; Littleton, 2002; Love, 1993). In contradiction, some studies have shown that the involvement patterns of minority and non-minority students in extracurricular activities are very similar to one another (D'Augelli & Hershberger, 1993; Watson & Kuh, 1996).

Watson and Kuh (1996) noted that minority students were actually more involved in campus activities than white students at predominantly white institutions. It is suggested however that this might be because Caucasian students have more opportunities for involvement in off-campus activities (Watson & Kuh, 1996). Sutton & Kimbrough (2001) note that minority student organizations, including historically minority focused fraternities and sororities, remain the primary avenue minority students participate in extracurricular student life. The literature consistently reaffirms that various forms of student engagement, both inside and outside of the

classroom, have a significant positive effect on student academic development and higher education persistence (Astin, 1975, 1993; Pascarella & Terenzini, 2005; Morck, 2010).

### **Pre-Enrollment Variables**

In addition to the previously discussed student socio-demographic variables (gender and race/ethnicity), literature provides evidence that situational variables in the pre-enrollment experience may influence college student success. There is agreement among researchers that students' pre-collegiate academic preparation and choices regarding future academic goals can contribute towards or prevent college attrition and to what degree the learner has academic success in his or her chosen program of study.

*Pre-Collegiate Academic Achievement.* Research has found that the most powerful predictor of academic achievement and persistence at the college level is academic readiness. Strong pre-collegiate academic achievement is commonly characterized by high standardized test scores and/or grade point averages in pre-collegiate coursework (Pascarella & Terenzini, 2005). Pike, Saupe (2002), Astin (1997), Ishler, and Upcraft (2005) found that academic readiness, ability, and commitment towards academic goals are the best predictors of collegiate success. In a study using 53,000 students across 365 institutions, Astin (1997) noted that high school grades and standardized test scores account for the greatest variance in student success of all influencing pre-enrollment variables contributing towards in students' college readiness.

*Educational Preference.* Student choice of academic major, or program of study, creates considerable variation in the type of courses he or she will enroll in during the course of an undergraduate career. Variations in curriculum shape the type of teaching style used by instructors, evaluation practices used to assess student learning and assign grades, and the balance of course content between that focusing on math and science principles and that in the humanities and social sciences. Given that learners present personal preferences towards instructional styles and content areas in their learning process, research has found that variations in curriculum development and instructional design can have positive and effects on academic achievement and persistence towards graduation (Belcheir, 2000; Pike & Saupe, 2002; Tinto & Pusser, 2006; Wawrzynski & Jessup-Anger, 2010).

## Summary

Higher education institutions have long been invested in the degree to which students are successful in reaching their educational goals, but increased demand for evidence of institutional effectiveness during the late 20th century due to policy changes that directly connected institutional funding and prestige to student outcomes has further elevated the issue for faculty members and administrators. Policy changes related to all areas of institutional governance, including faculty promotion and tenure, institutional funding and priorities, and public perceptions of institution prestige and value, became more intensely influenced by short term and long term benefits derived from the resources expended in support of higher education. As it takes time, as well as human and financial resources to recruit, enroll, and successfully educate undergraduate students, policies makers and educational administrators began placing greater emphasis on measures of educational efficiency and effectiveness to inform decision making. Starting in the 1970s, institutions began finding it advantageous to provide evidence of superior student academic achievement and persistence towards program completion in relation to that of their peer institutions.

As evidence of institutional efficiency and effectiveness, levels of student attrition, rates of persistence towards degree completion, and levels of student achievement have been adopted as fairly standard educational outcomes that can be discretely measured and compared between intuitions. Tinto's (1975, 1987) Student Integration Model of attrition offers a longitudinal model for understanding all the aspects and processes that influence a student's decision to leave college and how these processes interact to ultimately produce attrition. Astin, Tinto, and other researchers contributed to the literature which suggests that an important link exists between academic and social integration, sometimes referred to as engagement or involvement, and the quality of student learning and persistence towards an educational goal. Astin (1993) wrote, "Learning, academic performance, and retention are positively associated with academic involvement, involvement with faculty, and involvement with student peer groups" (p. 394).

Researchers studying student engagement have confirmed through numerous studies, across diverse settings and conditions, that the more frequently students engage with faculty, staff, and peers, the more likely, all other things being equal, those students are to excel

academically as well as persist to graduation (Astin, 1993, Tinto, 1975, 1987). As a result of this, institutions strive to provide environments that contribute to academic achievement and persistence within their institutions. One such strategy implemented by institutions to achieve selected performance indicators is the development of undergraduate learning communities, such as residentially based living-learning communities and non-residential learning communities, also referred to as freshmen interest groups (FIG).

As students become increasingly familiar with the institution, faculty and staff members, student support services, and their peers, they tend to demonstrate more satisfaction with the educational experience (Astin, 2009; Smith & MacGregor, 2009). As Astin (1975) found, increased engagement of all types, directly correlates with improved student satisfaction and academic success. While significant research has been conducted to support the positive effects that living-learning communities may have on educational outcomes like student achievement and institutional persistence, evidence of decreased student attrition, it is not known how freshmen interest groups influence these same outcomes. Furthermore, it is not known what impact socio-demographic student characteristics, such as gender and race, or pre-collegiate academic achievement and student educational preferences, related to FIG participation on a student's academic experience outcomes.

Based on this review of the literature, it can be assumed that student learning communities can and do serve as viable options for institutions of higher education to improve student academic achievement and institutional persistence. However, more studies need to be conducted to explore if the positive longitudinal outcomes connected to student participation in living-learning communities are similarly identified from student participation in a non-residential learning community program. Specifically, if student involvement in a freshmen interest group program will positively correlate to increased academic achievement and institutional persistence. Therefore, this study examines what different the FIG program participation makes in student academic achievement and institutional persistence. The study will also examine what interaction student gender, race, pre-collegiate achievement, and educational preference has on the influence FIG participation has on those outcomes.

## **CHAPTER THREE**

### **METHODOLOGY**

This chapter presents a detailed overview and discussion of the research design, study site, subjects, program description, and method of analysis used in the study. Academic achievement and persistence trends of students who participated in a first-year non-residential learning community, the Freshmen Interest Group (FIG) Program at Big Dog University compared to similarly qualified students at the same institution who did not participate in the FIG program.

#### **Research Design**

This study constituted causal-comparative research and was non-experimental in its design. Often labeled as *ex-post facto* research, causal-comparative research is defined as, “. . . research which attempts to identify a causal relationship between an independent variable and a dependent variable. This relationship was more suggestive than proven as the researcher did not have complete control, or manipulation, over the independent variable since it had already occurred via a natural course of events” (Shadish, Cook, & Campbell, 2002). In attempt to understand what effects participation in Big Dog University’s Freshmen Interest Group program had on academic achievement and institutional persistence, the study used existing educational data that was previously generated and collected as part of the institution’s standard education and business practices. Multiple regression analysis was used to examine the association between FIG participation and educational outcomes (academic achievement and institutional persistence).

#### **Variables**

Student demographic characteristics (gender and race), pre-collegiate academic achievement, educational preference, participation and non-participation in the Freshmen Interest Group (FIG) program, academic achievement, and institutional persistence were variables in the study. Student participation and non-participation in the Freshmen Interest Group (FIG) program served as the independent variables. Student demographic characteristics, gender and race, pre-collegiate academic achievement, and educational preference were control or attribute variables. Creswell (2005) defines control variables as, “. . . variables which the researcher does not want to

measure directly but that are important to consider and “neutralize” because of their potential influence on the dependant variable. Typically control variables are personal, demographic attributed or characteristics, such as: gender, intelligence, race, and socioeconomic status” (p. 87). Therefore, gender, race, pre-collegiate academic achievement, and educational preference were controlled for in the study’s analysis to determine how they relate to the FIG program’s effect on the dependent variables.

The dependent variables in the study were student academic achievement and institutional persistence. Student academic achievement refers to a student’s academic performance in his or her program of study, as measured by the participants’ cumulative non-weighted grade point average (GPA) at the end of each term. The literature supports the interchangeable use of academic achievement and academic performance. Grade point average serves as an easily accessible and measurable way to compare student academic achievement (Borden, Burton, & Evenbeck, 1999). Institutional persistence refers to student rate of re-enrollment at the same institution across subsequent semesters towards degree completion. This study measured institutional persistence by examining the percentage of students who initially enrolled at BDU in the Fall 2005 or Fall 2006 semester who remained enrolled at the institution through the end of their seventh semester, excluding summers.

### **Research Site**

The study site was Big Dog University (BDU), one of the largest and oldest public universities in the state university system. BDU is a comprehensive graduate-research university with a strong liberal arts tradition located in mid-sized capital city in the Southeastern United States. During academic year 2006-2007, the average adjusted high school grade point average (GPA) and Scholastic Aptitude Test (SAT) score for entering first-time in college (FTIC) students were 3.71 and 1,167.5 respectively (BDU, 2006). Select designated peer institutions for BDU included the University of Texas at Austin, the University of Maryland at College Park, Indiana University at Bloomington, the University of Georgia, and the University of Kansas (BDU, Institutional Research Online).

BDU’s total student enrollment during the Fall 2006 semester was 40,474 (BDU, 2006). Of these students, 31, 058 (76.7%) were undergraduates; 56.4% female and 43.4% male (2006).

Of enrolled undergraduates during the Fall 2006 semester, 25.7% self-reported themselves as belonging to a minority race/ethnic group (American Indian/Native Alaskan, Asian Pacific Islander, Black, or Hispanic); not including 200 students who self-reported as a non-resident aliens and 223 who elected not to self-report their race/ethnicity (BDU, 2006). Of the total undergraduate student population enrolled during the Fall 2006 semester, 22,648 self-reported their race/ethnic identity as Caucasian (BDU, 2006).

*FIG Program Design & Instruction.* Participation in the Freshmen Interest Group (FIG) program at Big Dog University was optional for first-year, FTIC students. The program includes participation in a one-credit colloquium course, required on and off-campus group excursions, completion of an online portfolio project, and enrollment in cluster of co-requisite academic courses with a cohort (25-30) of peers. The FIG program states its objectives for participating students include”

To reflect on the FIG topic and develop an understanding for pursuing it within the scholarly community; To learn how to identify and reflect on your in-class and out-of-class learning experience and how to utilize your reflections for learning about yourself and planning for the future; To reflect on your class experiences during your first semester and to learn about the different ways in which institution calls upon you to demonstrate your learning; To reflect on your out-of-class experiences during your first semester and to learn how you can connect your identities and interests with the people and places in the academic community; and To learn how to interact with your instructors and fellow students in ways which support your own goals and the values of the institution (Big Dog University, 2007).

Introduced during the Fall 2004 semester, each section of the FIG program includes required enrollment in HUM1920, a weekly colloquium course, and a cluster of linked academic courses which share a common cohort of students; not to exceed 30. The colloquium was taught by an upper-division undergraduate peer leader as a weekly seminar worth one academic credit and graded satisfactory/unsatisfactory (S/U) (Big Dog University, 2007). Peer leaders are selected from a competitive applicant pool. Peer leaders must have a 3.25 cumulative grade point average, have completed a minimum of 45 semester hours of undergraduate coursework at the

time of application, be in junior academic status before they instruct a section of the weekly colloquium, and successfully complete HUM4924, a training class for FIG Peer Leader instruction (Big Dog University, 2007).

*FIG Program Content.* To earn a satisfactory grade in the colloquium, students had to actively participate in each weekly class session and complete all assignments. While the format and content of the weekly seminars varied, common components included: Discussion of academic content being addressed in accompanying cluster courses, Exercises based on scholarly readings with subsequent papers and presentations; Effective modes of college learning; Exploration of curricular and co-curricular learning and leadership opportunities available in the university community; faculty guest speakers; Understanding the structure of academia; and development of short and long term academic plans (BDU, 2007).

Students participating in the FIG program must complete an online portfolio project during the course of their first semester in college. The portfolio project was designed to help facilitate student reflection about their past, present, and future, including values clarification regarding decisions related to academic major choice and occupational interest (Big Dog University, 2007). A minimum of two on or off-campus group excursions outside of the class time are used to help students gain in-depth exposure to BDU and its surrounding community. The FIG program states that one of these will be an “arts excursion” and one will be an “intellectual excursion” (Big Dog University, 2007). Students participating in the FIG program are required to enroll in a cluster of linked co-requisite courses during the same semester they are taking the weekly seminar. The clusters are constituted by three or four undergraduate courses sharing a common interest or academic program theme.

### **Subjects**

The subjects in this study were comprised of two groups (a) FTIC students who completed the Freshmen Interest Group (FIG) program, as determined by enrollment in HUM1920 during their first-semester at BDU, and (b) FTIC students who matriculated at BDU during the same time but did not participate in the FIG program. Completion of the FIG program means that the student received a grade (S/U) for HUM1920 during their first semester at BDU. Students included in the study were traditional-age, between 17-22 years old, first-time in



college (FTIC) undergraduate students who matriculated Big Dog University during the Fall 2005 or Fall 2006 semester. During the Fall 2005 semester there were 6,111 FTIC undergraduates enrolled at BDU; 58.5% female and 41.5% male; 24.7% self-reporting their identity as non-white. During the Fall 2006 semester there were 6,274 FTIC undergraduates enrolled at BDU; 58% female and 42% male; 34.4% self-reporting their identity as non-white (Big Dog University, 2007b).

For the purpose of this study, only first-time in college (FTIC) students, between the ages of 17-22, who entered the institution directly from high school and who matriculated with no more than 30 hours of dual enrollment, CLEP, advanced placement or International Baccalaureate college credit were included in the data analysis. FTIC students who were offered early matriculation during the Summer 2005 or Summer 2006 semester were excluded from the study's data analysis. These limitations were placed on the study's subjects because of differences known to occur in the enrollment patterns of students who matriculate with a large amount of accelerated college credit and those who do not (Pascarella & Terenzini, 2005).

Students granted early summer matriculation at BDU were also excluded from the study because they are mandated to participate in additional academic enrichment programs, outside of the FIG program, due to significant deficiencies in pre-collegiate academic achievement, an independent variable, which could have an influence on the study's dependent variables (Pascarella & Terenzini, 2005). The excluded students who matriculated during the summer semesters have historically had low rates of FIG participation, including them in the study's data analysis could have confounded the validity of the study's findings.

FTIC students are recruited to participate in the FIG program prior to registering for first-semester courses at BDU. Recruitment occurs via pre-enrollment email communications sent by the institution's Division of Undergraduate Studies, information posted on institution websites targeted towards admitted FTIC students, and during a required academic information presentation and advising appointment with an academic advising at orientation. The required academic information session provided to FTIC students during orientation covered information about academic requirements, academic support recourses, and enrollment information for optional academic enrichment opportunities like the FIG program. Family members of entering

students are also educated about the FIG program via information posted to BDU's website and during an optional academic information presentation offered to them during the institution's orientation program.

In addition, information about the goals and perceived benefits of the FIG program was reinforced during orientation small group meetings led by orientation peer leaders, during optional concurrent information sessions open to all students and family members who attended the orientation program, and by academic advisors and peer mentors staffing computer labs at the time new students are registering for their courses. Participation in the FIG program was open to all FTIC students matriculating at BDU during the Fall 2005 and 2006 semesters regardless of academic major, living arrangements, gender, pre-collegiate academic achievement, educational preference, or participation in one or more other enrichment programs available to first-year students at the institution.

Participation in the FIG program was voluntary for students during both the 2005-2006 and 2006-2007 academic years. All FTIC students matriculating to BDU during the Fall 2005 and Fall 2006 Semesters with less than 30 hours of dual enrollment, CLEP, advance placement or International Baccalaureate college credit were included in the study. Students who completed the FIG program were compared on several variables to their peers who did not complete the FIG program.

### **Data Source**

Demographic, pre-collegiate academic achievement, educational preference, academic achievement and institutional persistence data about the subjects included in the study were acquired from Big Dog University's Department of Admissions and Records. Access to student data was acquired following all guidelines established by the institution's Human Subjects Committee and the University Registrar. Specific student data used in the study included (a) gender, (b) self-reported race, (c) high school grade point average, (d) academic major at the point of matriculation, (e) completion or non-completion of the FIG program (HUM1920), (f) cumulative grade point averages following subsequent semesters of college attendance, and (g) college enrollment status at the same institution for subsequent semester.

Direct surveying or interviewing of the study's subjects did not take place. All analysis was causal-comparative in nature using existing educational data.

### **Validity**

Validity is defined as the extent to which an empirical measure adequately reflects the real meaning of the concept being considered (Babbie, 1998). Internal validity is the approximate truth about inferences regarding cause-effect or causal relationships (Glass & Hopkins, 1996). There may be many reasons, other than the independent variable, why the dependent variable may be affected. The key question in internal validity is whether observed changes can be attributed to the treatment or intervention (i.e., the cause) and not other possible causes (sometimes described as "alternative explanations" for the outcome).

Babbie (1998) emphasizes reverse causation and confounding variables as threats to internal validity in causal-comparative studies. Reverse causation would occur if the dependent variable was actually the independent variable. This was not determined a threat of internal validity in this study because the subjects' enrollment records and cumulative grade point average scores were independent from each other and collected in the normal course of educational practice and data collection. Because subjects self-selected their participation in the FIG program and were not randomly assigned to participate in the program, there may have been confounding variables unknown to the researcher which influenced the subjects' choice to participate, how the subjects responded to program participation, or the resulting outcome (academic achievement and institutional persistence) scores of both the FIG and non-FIG participant groups.

The researcher attempted to account for this in the study by using a large sample size and controlling for anticipated confounding variables (gender, race, pre-collegiate academic achievement, and educational preference) during regression analysis (Shadish, Cook, & Campbell, 2002). External validity refers to the generalizability of a study's outcomes (Babbie, 1998). Because this study was conducted at a single institution with only one program, the external validity of the results is questionable until more replication and analysis is conducted. Interaction effects of selection biased was a consideration in the study's statistical analysis Other common external validity threats (i.e. reactive effect of testing and multiple treatment interference) were not considered issues in this study (Babbie, 1998).

## **Research Questions**

The research questions guiding this study were:

- What differences exist, if any, in the academic achievement and institutional persistence of students who participated in the BDU's FIG program and students who did not participate in the program?
- If there are differences in academic achievement or institutional persistence between students who participated in BDU's FIG program and those students who did not, do the differences vary based on gender or race/ethnicity?
- If there are differences in academic achievement or institutional persistence between students who participated in BDU's FIG program and those who did not, do the differences vary based on pre-collegiate academic achievement?
- If there are differences in academic achievement or institutional persistence between students who participated in BDU's FIG program and those students who did not, do the differences vary based on educational preference (major choice)?

## **Data Analysis**

Descriptive and inferential statistics were used to analyze the data in this study.

Descriptive statistics allowed data to be summarized and organized via the use of frequencies, means and standard deviations (Creswell, 2005). Inferential statistics allowed the data to be analyzed for deeper understanding and logical patterns which suggest causal relationships (Ary, et al., 1996; Creswell, 2005). Determining the existence of any causal relationships in the data involved testing for a level of significance between the effects of the independent variables on the dependant variables. In this study, regression analysis was used to analyze if participation in the FIG program had a statistically significant effect on the academic achievement and institutional persistence of the subjects. PASW Statistics 18 was used to complete all data analyses in this study.

Before data were analyzed to address the study's research questions, a t-test was run comparing the high school grade point averages (GPA), as recalculated by BDU, of the 644 students who participated in the FIG program as compared to 4108 student who did not participate in the FIG program. This recalculation was done to determine if a significant

difference existed between the two groups. Ary et al. (1996) defines significance to mean that something is, “less likely to be a function of change than some predetermined probability” (p. 191). This step in the statistical analysis of the data was completed to ensure that the average GPA of the subjects who participated in the FIG program was not significantly higher or lower than the average GPA of the subjects who did not participate in the FIG program.

A significant difference in the GPAs of these two groups might suggest that students participating in the FIG program were not representative of the total FTIC population at BDU or that students who self-selected to participate in the FIG program were otherwise more or less academically qualified than the students who elected not to participate in the FIG program. A significant difference could also have suggested that a volunteer or “halo effect” may have existed in regards to student participation in the FIG program and levels of academic achievement and institutional persistence.

*Research Question One.* Regression analysis was used to address the study’s research questions. Regression modeling is used to analyze several variables, when the focus of the study is on the relationship between a dependent variable and one or more independent variables (Gordon & Hopkins, 1996). The study’s first research question sought to determine if there was a difference in the academic achievement and institutional persistence of students who participated in the FIG program compared to students who did not participate in the FIG program. To understand what effect FIG participation has on education effectiveness, the following regression analysis model was used:

$$\mathbf{O} = f(\mathbf{P} + \mathbf{G} + \mathbf{R} + \mathbf{H} + \mathbf{S} + \mathbf{L})$$

### **Figure 3.1 Model of Educational Effectiveness**

**O** represents the educational outcomes that this study uses as measurable standards of educational effectiveness. These outcomes, the study’s dependent variables, are cumulative grade point average scores and rates of re-enrollment measured at predetermined points along the subjects’ undergraduate career. The model considers six variables in the function which may be impacting the measured outcome. **P** is subject’s participation or non-participation in the FIG

program, **G** is subject's gender, **R** is subject's race, **H** is pre-collegiate academic achievement (college academic readiness as demonstrated by a cumulative high school GPA score), **S** is educational preference (choice of an academic major in a STEM or non-STEM curriculum area), and **L** is length of time (based on semesters) enrolled in undergraduate education from the initial point of matriculation.

These variables were included in the analysis model because they may influence the measured educational outcomes and therefore have to be statistically controlled for during the regression analysis. Previous studies have shown that differences may exist in the academic performance and persistence rates of students based on gender and race identity. Literature also has shown that collegiate success influences academic readiness prior to enrollment. Using the subjects' cumulative high school scores as a determinate of academic readiness in the analysis was intended to account for those differences. Since some differences may exist between the curriculum of STEM and non-STEM degree programs in terms of content difficulty, pedagogical approaches to instruction and learning assessment, and the complexity of required program milestones that might influence student achievement or attrition, the educational preference or major choice of the subjects were controlled for in analysis. Finally, as students develop study and coping skills over time in their educational career and move from general studies courses into those specific to a program of study, levels of motivation and academic challenge are known to change. These factors, along with students' movement away from the semester of FIG participation, required that the length of time students have been enrolled since their matriculation to college can also be controlled for in the regression model.

Participation in the FIG program, denoted as **P**, is the independent variable in this study and variable of interest for the first research question. To understand what effect participation in the FIG program had on academic achievement longitudinally, a regression analysis was conducted to compare the cumulative grade point averages of FIG participants against non-participants at the conclusion of the subjects' first, second, fourth, fifth, and seventh semesters of college attendance, omitting any possible summer attendance. As regards institutional persistence, a regression analysis was conducted to compare the re-enrollment rates of FIG participants against non-participants at the conclusion of all subjects' second, fourth, fifth, and

seventh semesters of consecutive college attendance, again omitting any periods of summer attendance.

*Research Questions Two, Three, and Four.* The study's second, third, and fourth questions sought to determine if subject gender, race, pre-collegiate educational achievement and education preference variables influenced the effect FIG participation had on academic achievement or institutional persistence outcomes during the the undergraduate career.

For academic achievement, a regression analysis was conducted for cumulative grade point average scores at the conclusion of the subjects' first, second, fourth, fifth, and seventh semesters of college attendance, omitting any possible summer attendance. As regards to institutional persistence of FIG participants and influences by the control variables (**P**, **G**, **R**, **H**, **S**, and **L**), a regression analysis was used to analyze the re-enrollment rates of FIG participants with non-participants at the start of the subjects' second, fourth, fifth, and seventh semesters of consecutive college enrollment at the same institution, omitting any periods of possible summer attendance.

### **Summary**

This causal-comparative study used existing educational data to determine the effect of a Freshman Interest Group (FIG) program had on academic achievement and institutional persistence controlling for subject demographic characteristics (gender and race), pre-collegiate academic readiness (cumulative high school GPA score), educational preference (choice of major in a STEM or non-STEM curriculum area) and length of time enrolled (persistence). Further analysis was also conducted to determine what, if any, interaction existed between the control variables and the effect FIG participation had on educational outcomes.

Literature supports the interchangeable use of academic achievement and academic performance; the grade point average serves as an easily accessible and measurable way to compare student academic achievement (Borden et al., 1999). Institutional persistence is defined in the study as the rate of subject re-enrollment at the same institution from one semester to the next. The FIG program at Big Dog University (BDU) includes an optional one credit colloquium seminar course coupled with two or three for credit academic classes. The courses are linked by an academic, co-curricular, or interest theme. The program involves intentional on-campus and

off-campus programming and other interventions designed to develop a social and learning community for no more than 30 FTIC students; there was not a residential component to the program.

Analysis of the dependent variables, academic achievement and institutional persistence, was done using existing educational data collected by BDU during normal education and business practices. The study's subjects consisted of FTIC students who matriculated at BDU during the Fall 2005 and Fall 2006 semesters; excluding those who matriculated with 30 or more dual enrollment, CLEP, advance placement or International Baccalaureate college credit. These students belong to one of two mutually exclusive groups, those who participated in the FIG program during their first semester at BDU and those who did not participate in the program. The cumulative GPA scores and re-enrollment rates for the two subject groups were analyzed using regression analysis to determine what effect FIG participation has on academic achievement and institutional persistence when controlling for gender, race, pre-collegiate academic achievement, and education preference. Further analysis went on to look at what interaction may have existed between the presences of the control variables and the effect FIG participation had on the educational outcomes, academic achievement and institutional persistence.



## **CHAPTER FOUR**

### **RESULTS**

The purpose of this study was to examine the effect of the Freshmen Interest Group (FIG) program, a non-residential learning community, at Big Dog University (BDU) as a means of improving the quality of the undergraduate educational effectiveness. Specifically, this study examined the relationship between participation in the program and students' academic achievement and institutional persistence. The data analysis reported in this chapter considers the impact of the FIG program on those educational outcomes and discusses what interaction the gender, ethnicity, pre-collegiate academic achievement, and educational preference of the subjects may interact with those effects.

#### **Methodology**

The study used a causal-comparative research methodology. Similar to an experiment, causal-comparative research examines the impact of an independent variable on a dependent variable, with the exception that the researcher does not manipulate the independent variable. In causal-comparative research, the independent variable has already occurred via a natural or other process void of manipulation by the researcher (Ary, Jacobs, & Razavieh, 1996). The data used in this study came from the Fall 2005 and 2006 First-Time-In-College (FTIC) cohorts at Big Dog University. The data included demographic information (race and gender), pre-collegiate academic achievement, educational preference (major choice), academic achievement, and institutional persistence information.

Access to student data was acquired following all guidelines established by the institution's Human Subjects Committee and student records administrators. Specific student data included (a) gender, (b) self-reported race, (c) high school grade point average as calculated by BDU Office of Admissions using a standard formula in the admissions process, (d) academic major at the point of matriculation, (e) completion or non-completion of the FIG program (HUM1920), (f) cumulative grade point averages following subsequent semesters of college attendance, and (g) enrollment status at the same institution for subsequent semesters. Students from the Fall 2005 and 2006 cohorts who matriculated with 30 or more dual enrollment, CLEP, Advanced Placement or International Baccalaureate college credit hours were excluded from the

study. Students that participated in the FIG program were compared to peers who did not participate in the FIG program. Direct surveying or interviewing of the study’s subjects did not take place; data analysis was restricted only to existing academic records.

Educational data for 4,101 students who matriculated during the Fall 2005 semester and 3,717 students who matriculated during the Fall 2006 semester were obtained from BDU’s Office of the University Registrar. Upon receipt of the data, the researcher examined and “cleaned” the data to ensure that all records were in an appropriate format and met the student profile characteristics established by the study’s methodology. The 4,101 students from the 2005 cohort included 256 students who participated in the FIG program and 3,845 who did not. The 3,716 students who matriculated in the 2006 cohort included 390 students who participated in the FIG program and 3,326 who did not. The researcher created a decision rule to omit cases from the analysis for those students who had either an extremely low or high pre-collegiate GPA that did not match BDU’s standard admissions profile. Eight such cases were eliminated using the decision rule; one was a pre-collegiate GPA of 0.00 and seven who had a pre-collegiate GPA of 9.80. The researcher was unable to determine the cause of these outliers in the data set.

Table 4.1 illustrates that the study sample consisted of 7,165 students; a total of 644 who participated in the FIG program and 7,165 who did not. Using the decision rule, the mean high school GPA for students who participated in the FIG program was 3.61 compared to 3.65 for those students who did not participate in the program. The standard deviation of FIG participant GPA scores was .361, while the standard deviation for non-FIG participant GPA scores was .441. A t-test analysis did not find that the difference between the pre-collegiate academic achievement scores of the two groups to be statistically significant.

**Table 4.1 Test Comparing FIG Student and Non-FIG Student Pre-Collegiate GPA Scores**

	Took HUM1920	N	Mean	Std. Deviation	Std. Error Mean
Pre-Collegiate GPA Scores	Non-FIG	7165	3.653147	.4417219	.0047512
	FIG	644	3.610139	.3610167	.0143403

## **Participant Demographics**

This section provides a description of the subjects included in the study's data analysis; the information is illustrated in Table 4.2.

### **Study Sample and FIG Participants**

The study sample of 7165 students, 644 of whom had participated in the FIG program, consisted of 43.3% men; 77.2 % White; 6.7 % Black; 11.4 % Hispanic; and 3 % Asian students. The demographics of those who participated in the FIG program resembled the total group: 41.3 % men; 74.7 % White; 7.7 % Black; 12.3 % Hispanic; and 1.7 % Asian students. The difference Black and Hispanic students who participated in the FIG program compared to non-participants was an important observation. More Black and Hispanic students self-selected to participate in FIG than not participate; the trend was the opposite for White students. Females also participated in the FIG program at a higher rate than male students.

The mean pre-collegiate achievement (GPA) score for the study sample was 3.6531 and the mean score for FIG participants only was 3.6101. The summary statistics presented in Table 4.2 show that the mean achievement (GPA) scores of the full sample always, including their pre-collegiate scores, always remained higher than the FIG participant group. This also occurred when comparing the rates of persistence for the full sample with the FIG participants. During all observations, the full study sample rate of persistence was found to be higher than the FIG participant only rate of persistence. This difference was greatest during the fifth and seventh semesters of observation.

Table 4.2 shows the mean semester one academic achievement for the sample was 3.0483. This score increases incrementally for each semester thereafter with the largest gain (0.0594) taking place between the second and fourth semesters. This may be an important observation as it marks the transition from subjects' first-year in college and the sophomore year. The mean semester one academic achievement score for FIG participants was 3.6101. This score was 0.430 points below the semester one score for the entire sample. Unlike the scores for the sample which increased each semester, the mean achievement score for FIG participants decreased by 0.0082 in semester two. After this initial decrease, the score rebounded by 0.0598 in semester four and continued to increase incrementally during semesters five and seven. Other

than the score decrease observed in the second semester for FIG participants, mean achievement scores increased each semester. Semester to semester gains were greater for FIG participants than the entire study population.

The mean semester one institutional persistence score for the sample was 0.9653 which was the opposite of the trend noted for academic achievement scores which increased incrementally for each semester thereafter. The institutional persistence scores for the entire sample decreased in each observed semester with the largest decrease (-0.0931) taking place between the second and fourth semesters. This observation may be important because it marks the transition from subjects' first-year in college and the sophomore year. This same observation was made during the same period of time when the entire sample showed its greatest increase in the mean achievement score. This finding points to a period in a students' academic career as being critical in terms of his or her persistence and academic achievement.

The mean semester one institutional persistence score for FIG participants was 0.9551. This was -0.0084 less than the mean score for the full sample. The mean institutional persistence score for FIG participants decreased, as it did for the entire sample, incrementally at each observation during the course of the study. The mean persistence score of FIG participants always remained lower than the score for the entire study sample. This difference was greatest in the fifth and sixth semesters.

*2005 Cohort.* Data from 4,101 unique students comprising the 2005 cohort were used in a analysis of academic achievement and institutional persistence. The 2005 sample closely resembled the demographics of the total FTIC student population that matriculated to BDU in 2005. The cohort consisted of 42.7 % men; 77.2 % White; 7.2 % Black; 11.2 % Hispanic; and 4.2 % Asian students. The mean pre-collegiate GPA score for all members of the 2005 cohort was 3.6588. This closely relates to the mean pre-collegiate GPA score for the full study sample (3.6531) and that for those identified in the study as FIG participants (3.6101).

*2006 Cohort.* Data from 3,716 unique students comprising the 2006 cohort were used in a analysis of academic achievement and institutional persistence. The 2006 sample closely resembled the demographics of the total FTIC student population that matriculated to BDU in 2006. The cohort consisted of 44.9 % men; 77.3 % White; 7.3 % Black; 11.6 % Hispanic; and

3.6 % Asian students. The mean pre-collegiate GPA score for all members of the 2006 cohort was 3.6322. This closely relates to the mean pre-collegiate GPA score for the full study sample (3.6531) and that for those identified in the study as FIG participants (3.6101).

**Table 4.2 Summary Statistics of Student Characteristics, 2005 and 2006 Cohorts**

	<b>Full Sample</b>		<b>FIG Only</b>		<b>2005</b>	<b>2006</b>
	<b>Mean</b>	<b>Std. Dev.</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Mean</b>	<b>Mean</b>
<b><i>Percent of Students:</i></b>						
Male	0.4330	0.4955	0.4133	0.4928	0.4270	0.4390
Asian	0.0307	0.1725	0.0341	0.1815	0.0429	0.0363
Black	0.0679	0.2516	0.0774	0.2674	0.0726	0.0739
Hispanic	0.1140	0.3178	0.1238	0.3297	0.1122	0.1160
White	0.7728	0.4190	0.7477	0.4347	0.7723	0.7738
Majored in STEM	0.2699	0.4439	0.2492	0.4329	0.2589	0.2640
Enrolled in HUM1920	0.0826	0.2754	1	0	1	0
High School GPA	3.6531	0.4416	3.6101	0.5012	3.6588	3.6322
<b><i>Academic Achievement</i></b>						
Semester 1 GPA	3.0483	0.7459	2.9938	0.7810	3.0321	2.9932
Semester 2 GPA	3.0734	0.6713	2.9856	0.7015	3.0603	3.0343
Semester 4 GPA	3.1328	0.5606	3.0454	0.5760	3.0342	3.1231
Semester 5 GPA	3.1506	0.5307	3.0745	0.5263	3.1345	3.1639
Semester 7 GPA	3.1857	0.4967	3.1243	0.4815	3.1459	3.1832
<b><i>Institutional Persistence</i></b>						
Enrolled Semester 1	1	0	1	0	1	0
Enrolled Semester 2	0.9635	0.1874	0.9551	0.2072	0.9622	0.9259
Enrolled Semester 4	0.8704	0.3359	0.8622	0.3449	0.8764	0.8726
Enrolled Semester 5	0.8443	0.3626	0.8266	0.3789	0.8644	0.8563
Enrolled Semester 6	0.7948	0.4039	0.7632	0.4255	0.7852	0.7684
Num. of Unique Students	7165		644		4101	3716
Num. of Observations	7165		644		4101	3716

### **FIG Enrollment Analysis**

Students from the 2005 and 2006 cohorts were combined into a single data set and analyzed as such. Pre-collegiate grade point averages (GPA) of the participants were examined to determine if significant statistical difference existed between the FIG participants and non-FIG participants. Pre-collegiate mean GPA scores were one characteristic used to determine the similarity of groups. A statistically higher GPA by FIG participants would indicate that the students who enroll in the FIG program were not representative of the total population of first-year students at BDU, indicating that they were academically stronger students or students who demonstrated behaviors with a higher level of academic capacity. Likewise, a statistically lower GPA by FIG participants would suggest that those enrolled in the FIG program were academically weaker or students who demonstrated behaviors that suggest less academic motivation.

A t-test was used to compare the mean GPA scores between groups. When computing the t-test, it is assumed that the samples are independent from each other and normally distributed. The pre-collegiate GPA scores of all participants were recalculated by BDU's Office of Admissions during the admissions process using a standard scale. This scale uses a common course weighting system and omits elective courses outside of core math, science, English, foreign language, social science, and history curriculum areas. All student scores were independent from each other and obtained from the institution's Office of the Registrar.

The distribution of FIG participant GPA scores did not meet the Kolmogorov-Smirnov D test of normality ( $p = .001$ ) nor did the distribution of the non-FIG participant GPA scores ( $p = .000$ ). Glass and Hopkins (1996) indicate that a violation of the assumption of normality "has almost no practical consequences in using the two-tailed t-test" (p. 291). The t-test is strong enough to account for violations of the assumption of normality. As the size of the studied group increases, the probability becomes more accurate (Glass & Hopkins, 1996). As a result, it was determined that there would be no adverse consequences in the study's findings because a large enough number of cases for the groups, FIG and non-FIG participants, existed to assume that the participants were sufficiently heterogeneous for data analysis in the study.

The assumption of variance of homogeneity was calculated using Levene’s Test of Equality of Variances with the assistance of PASW software. There was a difference in the variance of both distributions ( $p = .001$ ). Students who enrolled in the FIG program had significantly lower ( $p = .001$ ) high school GPA scores than students who did not enroll in the course, as seen earlier in Table 4.1. This finding is important in the analysis of additional study data when inferring what impact FIG program participation may have on student academic achievement or institutional persistence. It indicated that students enrolling in the FIG program had significantly lower pre-collegiate GPA score than students who do not enroll in the program.

In comparing the pre-collegiate GPA scores of FIG participants based on gender, race/ethnicity, and educational preference, the data indicated that female FIG participants had lower pre-collegiate GPA scores than males. Black and Hispanic participants also had lower pre-collegiate GPA scores compared to other racial groups. The data also indicated that students who self-selected to matriculate to college in an academic major which belonged to the science, technology, engineering, or math (STEM) curriculum area had a slightly higher pre-collegiate GPA score than participants who elected to matriculate in a non-STEM curriculum area. These scores are listed below in Table 4.3.

**Table 4.3 Gender, Ethnicity, and Educational Preference Pre-Collegiate GPA Scores**

	<i>n</i>	Mean
Male	4429	3.71
Female	3380	3.55
White	6038	3.66
Black	530	3.56
Asian	239	3.67
American Indian or Alaska Native	46	3.71
Hispanic	888	3.57

**Table 4.3 – continued**

	<i>n</i>	Mean
Race/Ethnicity Unknown	46	3.62
Native Hawaiian	22	3.65
STEM Major	2107	3.68
Non-Stem Major	5702	3.63

An analysis of the probability of student participation in the FIG program based on demographic and academic factors found that female, Black, and Hispanic students were significantly more likely to enroll in the FIG program than students who were male or identified in other racial groups. Results in the second column of Table 4.4 illustrate that female and Hispanic students were significantly more ( $p \leq .05$ ) likely to self-select participation in the FIG program; Black students were also significantly more ( $p \leq .01$ ) likely to self-select participation. It is important to note that the 2006 cohort had significantly more Females self-select, column five, participation in the FIG program than men; something not found during the analysis of the 2005 cohort. Likewise, results in column four illustrate that significantly more Black students in the 2005 cohort elected to participate in FIG than other racial groups. This same pattern of significantly greater participation was not found in the 2006 cohort of students.

Adding academic preference (e.g. STEM or non-STEM major choice and pre-collegiate academic achievement) to the regression analysis as shown in the third column of Table 4.4 indicated that students in STEM majors were significantly less ( $p \leq .05$ ) likely to enroll in the FIG program as compared to non-STEM peers. Comparing the participation levels of STEM students by cohorts, results in column four indicate that significantly less STEM majors in the 2005 self-selected to participate in the FIG program compared to non-FIG students. This was not the same case of the 2006 cohort. Regarding pre-collegiate achievement scores, students whose high school GPA score was in the second highest, third highest, and fourth highest quartiles of the sampled students were significantly less ( $p \leq .01$ ) likely to self-select participation in the FIG program. This finding was significant, -0.0320, for students with pre-collegiate GPA scores



in the fourth (or highest) quartile. The probability that students would participate in the FIG program was highest in the first quartile (or lowest). These findings are important to the study as they indicate which groups of students were more likely to self-select participation in the FIG program.

**Table 4.4 Student Characteristic Effects on Probability of Enrolling in FIG Program**

	<b>Pooled</b>			<b>2005</b>	<b>2006</b>
Female	0.0062*	0.0057*	0.0102**	-0.0007	0.0240**
	[0.0028]	[0.0028]	[0.0028]	[0.0034]	[0.0045]
Asian	0.013	0.0144	0.0159	0.0385**	-0.003
	[0.0087]	[0.0088]	[0.0089]	[0.0131]	[0.0126]
Black	0.0141*	0.0156**	0.0119*	0.0185*	0.0087
	[0.0060]	[0.0061]	[0.0059]	[0.0075]	[0.0094]
Hispanic	0.0105*	0.0109*	0.008	0.0126*	0.002
	[0.0046]	[0.0046]	[0.0046]	[0.0057]	[0.0071]
STEM Major		-.0096**	-.0074*	-.0229**	0.0053
		[0.0031]	[0.0031]	[0.0035]	[0.0051]
Pre-Collegiate GPA: 2nd Quartile			-.0116**	-.0160**	-.0081
			[0.0037]	[0.0041]	[0.0063]
Pre-Collegiate GPA: 3rd Quartile			-.0115**	-.0161**	-.0119*
			[0.0034]	[0.0039]	[0.0056]
Pre-Collegiate GPA: 4th Quartile			-.0320**	-.0248**	-.0467**
			[0.0033]	[0.0039]	[0.0052]
Demographics	X	X	X	X	X
STEM Major		X	X	X	X
High School GPA			X	X	X
Observations	39050	39050	39050	20430	18560
Pseudo R-Square	0	0	0	0.01	0.01

Robust standard errors in brackets

\* significant at 5% \*\*significant at 1%

Several interesting interactions are presented in Tables 4.3 and 4.4 which are also important to this study. While female, Black, and Hispanic students were significantly more likely to enroll in the FIG program, they also had significantly lower pre-collegiate GPA scores than males and other demographic groups. Non-STEM students were significantly more likely

to participate in the FIG program. As a group, non-STEM students had lower pre-collegiate GPA scores than STEM students.

Students with pre-collegiate GPA scores in quartile one represented the highest scores within the study sample. Students in quartiles two through four (highest) were significantly less likely to participate in the FIG program. This effect was compounded by the fact that among the quartile ranges, those in quartile one were the least likely to participate. Table 4.1 illustrates that the mean pre-collegiate GPA score for students who participated in the FIG program was -0.0430 lower than those not in the program. This finding was not a statistically significant difference but it is important to consider in relation to the research questions. This regression analysis suggests there are actually differences in the likelihood of self-selecting to participate in FIG. This issue was mitigated somewhat in the preceding analysis and discussion by controlling for the variables that appeared to indicate self-selection bias.

### **Research Questions**

*Research Question One.* What differences exist, if any, in the academic achievement and institutional persistence of students who participated in the BDU's FIG program and students who did not participate in the program? To determine if differences existed between FIG students and non-FIG students in academic performance and institutional persistence a regression analysis was conducted.

### **Academic Achievement**

A regression analysis was conducted using the cumulative GPA scores from the conclusion of the subjects' second, fourth, fifth, and seventh semesters of college enrollment; summers as well as students who dropped out were omitted. Students who participated in the FIG program had higher mean cumulative GPA scores compared to students who did not participate in the program as illustrated in column one of Table 4.5. The regression analysis controlled for students who had dropped out and were no longer enrolled during the semester of observation. The FIG program had a statistically significant positive effect ( $p \leq .01$ ) on the mean GPA score of participants. The mean GPA score increased by 0.0800. The study's model was informed by what was known about the effects of student demographic variables, pre-collegiate academic preparation, and educational preference, and duration of time enrolled at the institution

on student achievement. The regression analysis controlled for these factors to understand the influence these variables may have on academic achievement and the effect of FIG participation on that outcome. The results presented in column five of Table 4.5 illustrate the results of the regression analysis. Controlling for these variables, the FIG program was found to have had a statistically significant positive effect ( $p \leq .01$ ) on the mean GPA score of program participants, an increase of 0.0454.

Examining how sub-groups of students, as defined by gender, race, pre-collegiate GPA score, educational preference (STEM or non-STEM) fared in terms of academic achievement regardless of FIG participation, the analysis indicated that females had statistically significant higher ( $p \leq .01$ ) GPA scores. The mean GPA score was 0.1007 higher than that of males. Black students had statistically lower ( $p \leq .01$ ) GPA scores (-0.0937), while Hispanic students had statistically higher ( $p \leq .01$ ) GPA scores (0.0257). The GPA scores of STEM majors were statistically significantly lower ( $p \leq .01$ ) compared to non-STEM peers at -0.2218 lower. Students in the study with pre-collegiate GPA scores found in the second, third, and fourth quartiles all had statistically higher ( $p \leq .01$ ) mean GPA scores for collegiate academic achievement over those in the first quartile. Table 4.4 illustrated that students in quartile one were most likely to self-select participation in the FIG program; quartile four students were least likely. As quartile four students had the highest pre-collegiate GPA scores and quartile one students had the lowest. Table 4.5 demonstrates that this stratification remains consistent in the same direction when examining the cumulative GPA scores for collegiate work of students in the sample.

The regression also controlled for the length of time subjects were enrolled at the institution. The results, presented in column five of Table 4.5, show that length of time a student was enrolled at the institution had a statistically significant positive effect on the mean academic achievement scores of the study's sample. This effect was positively the length of time students were enrolled increased. The differences were 0.0231, 0.0735, 0.0890, and 0.1184 for semesters two, four, five, and seven respectively. This was a statistically significant effect ( $p \leq .05$ ) for semester two as well as the other ( $p \leq .01$ ) semesters.

**Table 4.5 Effects of FIG Participation on Academic Achievement**

	Pooled					05 Cohort	06 Cohort
Took HUM1920	0.0800**	0.0816**	0.0849**	0.0458**	0.0454**	0.0207	0.0710**
	[0.0124]	[0.0123]	[0.0123]	[0.0115]	[0.0115]	[0.0180]	[0.0150]
Female		0.2060**	0.1956**	0.1005**	0.1007**	0.0967**	0.1085**
		[0.0067]	[0.0066]	[0.0062]	[0.0062]	[0.0086]	[0.0089]
Asian		-0.0242	0.0001	-0.0069	-0.0069	-0.0596*	0.0383
		[0.0180]	[0.0178]	[0.0165]	[0.0166]	[0.0253]	[0.0212]
Black		-.1936**	-.1655**	-.0924**	-.0937**	-.0934**	-.0906**
		[0.0135]	[0.0134]	[0.0123]	[0.0123]	[0.0165]	[0.0183]
Hispanic		-.0378**	-.0308**	0.0259**	0.0257**	0.0435**	0.0065
		[0.0103]	[0.0103]	[0.0096]	[0.0096]	[0.0133]	[0.0138]
STEM Major			-.1770**	-.2228**	-.2218**	-.2341**	-.2101**
			[0.0077]	[0.0071]	[0.0071]	[0.0102]	[0.0099]
Pre-Collegiate GPA: 2nd Quartile				0.2082**	0.2066**	0.2004**	0.2135**
				[0.0092]	[0.0092]	[0.0124]	[0.0137]
Pre-Collegiate GPA: 3rd Quartile				0.3618**	0.3595**	0.3639**	0.3522**
				[0.0084]	[0.0083]	[0.0116]	[0.0122]
Pre-Collegiate GPA: 4th Quartile				0.6394**	0.6363**	0.6519**	0.6153**
				[0.0080]	[0.0080]	[0.0108]	[0.0119]
2nd Semester					0.0231*	0.0256	0.0203
					[0.0104]	[0.0144]	[0.0149]
4th Semester					0.0735**	0.0755**	0.0710**
					[0.0098]	[0.0136]	[0.0140]
5th Semester					0.0890**	0.0984**	0.0782**
					[0.0096]	[0.0133]	[0.0138]
7th Semester					0.1184**	0.1370**	0.0980**
					[0.0095]	[0.0132]	[0.0137]
Demographics		X	X	X	X	X	X
STEM Major			X	X	X	X	X
High School GPA				X	X	X	X
School Year Fixed Effects					X	X	X
Constant	3.1202**	3.0226**	3.0723**	2.8336**	2.7779**	2.7568**	2.8029**
	[0.0034]	[0.0057]	[0.0058]	[0.0072]	[0.0103]	[0.0142]	[0.0150]
Observations	34934	34934	34934	34934	34934	18259	16675
R-squared	0	0.03	0.05	0.2	0.2	0.21	0.2

Robust standard errors in brackets

\* significant at 5%; \*\* significant at 1%

As discussed earlier in the study, the length of time a student spent enrolled at the institution correlated with higher academic achievement scores. This effect is presumed to be caused by a shift from the general studies curriculum to a declared major field of study, the attrition (departure) of less academically qualified or motivated students, and the increased development of coping and other skills which in turn support academic success. In short, those students who persist may have learned how to cope within the academic environment.

#### Institutional Persistence

A regression analysis was conducted using institutional reenrollment rates from the subjects' second, fourth, and fifth semesters following their initial term of college enrollment; with summer enrollments omitted. Students who participated in the FIG program had lower rates of institutional persistence when compared to students who did not participate in the program as illustrated in column one of Table 4.6. The FIG program had a statistically significant negative effect ( $p \leq .05$ ) on the persistence rate of FIG participants; a -0.0137 decrease. Again, the results were informed by what is known about the effects of student demographic variables, pre-collegiate academic preparation, and educational preference, and duration of time enrolled at the institution on institutional persistence. The analysis controlled for these factors to help explain what effect these variables may have on institutional persistence and the effect of FIG participation in determining that outcome. The results presented in column five of Table 4.6 illustrate the regression analysis using the full model of the regression analysis. Controlling for the gender, race, pre-collegiate achievement, educational preference variables, the FIG program did not have a statistically significant effect on the rate of institutional persistence.

Examining the students by using the variables gender, race, pre-collegiate GPA score, educational preference (STEM or non-STEM) in terms of institutional persistence regardless of FIG participation in column five, the analysis found that females had statistically significant lower ( $p \leq .01$ ) rates of persistence. Their persistence rate was -0.078 less than that of the male students in the study sample. Black students had a statistically higher ( $p \leq .01$ ) rate of persistence over other racial groups; 0.0303.

The persistence rate of STEM majors was found to be statistically lower ( $p \leq .01$ ) compared to non-STEM peers; or -0.0180 less. Students in the study with pre-collegiate GPA

scores in the first, second, or third (lowest to highest) quartiles all had statistically higher ( $p \leq .01$ ) rates of institutional persistence compared to students in the fourth (highest) quartile. Table 4.4 illustrated that students in quartile four were most likely to self-select participation in the FIG program; quartile one students were least likely. As quartile one students had the highest pre-collegiate GPA scores and quartile four students had the lowest, as seen in Table 4.5 their rates of institutional persistence were similarly stratified favoring those in highest versus lowest quartile ranges.

The regression analysis also controlled for the length of time subjects had been enrolled at the institution. The results, presenting in column five of Table 4.6, show that length of time a student is enrolled at the institution had a statistically significant negative effect ( $p \leq .01$ ) on the rate of persistence for the students in the sample. This finding supports the idea that the longer students are enrolled at the institution, the greater the chance they have of stopping out or otherwise discontinuing their enrollment because of personal or academic reasons, a combination of both, or because of other unknown factors. This negative effect appears to be further compounded based on length of time subjects were enrolled. The attrition (drop out) rate in semester two was -0.2006 and -0.2920 for semester five.

**Table 4.6 Effects of FIG Participation on Institutional Persistence**

	Pooled				05 Cohort	06 Cohort	
Took HUM1920	-0.0137*	-0.0142*	-0.0148*	-0.0101	-0.0089	-0.0134	-0.0071
	[0.0059]	[0.0059]	[0.0059]	[0.0057]	[0.0048]	[0.0079]	[0.0062]
Female		.0045	.0035	-.0086**	-.0078**	-.0078*	-.0081*
		[0.0031]	[0.0031]	[0.0031]	[0.0026]	[0.0036]	[0.0037]
Asian		0.0069	0.0089	0.0067	0.0059	-.0096	0.0216**
		[0.0087]	[0.0086]	[0.0086]	[0.0071]	[0.0115]	[0.0083]
Black		0.0271**	0.0292**	0.0366**	0.0303**	0.0341**	0.0264**
		[0.0056]	[0.0055]	[0.0050]	[0.0039]	[0.0051]	[0.0059]
Hispanic		-.0026	-.002	0.0051	0.0045	-.0055	0.0150**
		[0.0049]	[0.0049]	[0.0047]	[0.0038]	[0.0056]	[0.0052]
STEM Major			-.0163**	-.0211**	-.0180**	-.0290**	-.0072
			[0.0036]	[0.0037]	[0.0031]	[0.0045]	[0.0042]
Pre-Collegiate GPA: 2nd Quartile				0.0372**	0.0315**	0.0261**	0.0376**
				[0.0036]	[0.0028]	[0.0040]	[0.0039]

**Table 4.6 - continued**

	Pooled				05 Cohort	05 Cohort	
Pre-Collegiate GPA: 3rd Quartile				0.0469**	0.0389**	0.0350**	0.0428**
				[0.0033]	[0.0027]	[0.0038]	[0.0038]
Pre-Collegiate GPA: 4th Quartile				0.0701**	0.0577**	0.0562**	0.0589**
				[0.0032]	[0.0025]	[0.0036]	[0.0037]
2th Semester					-.2006**	-.2125**	-.1876**
					[0.0074]	[0.0105]	[0.0105]
4th Semester					-.2340**	-.2486**	-.2180**
					[0.0076]	[0.0107]	[0.0107]
5th Semester					-.2920**	-.3104**	-.2717**
					[0.0078]	[0.0109]	[0.0111]
Demographics	X	X	X	X	X	X	X
STEM Major		X	X	X	X	X	X
High School GPA			X	X	X	X	X
School Year Fixed Effects					X	X	X
Observations	39050	39050	39050	39050	39050	20490	18560
Pseudo R-Square	0	0	0	0.02	0.12	0.13	0.12

Robust standard errors in brackets

\* significant at 5%; \*\* significant at 1%

*Research Questions Two, Three, and Four.* Is there a statistical difference in the academic achievement or institutional persistence of students who completed the FIG program based on gender or race, pre-collegiate academic achievement, or educational preference status? A regression analysis was used to determine if an interaction existed between these variables and the effect FIG participation has on either the academic performance or institutional persistence of students in the study in addition to the interaction effects of subject gender, race, pre-collegiate achievement, and educational preference variables.

#### Academic Achievement

A regression analysis was conducted using the cumulative GPA scores from the conclusion of the subjects' second, fourth, fifth, and seventh semesters of college enrollment; summers were omitted. Analysis for only those students who participated in the FIG program found that as the whole, there was a statistically significant negative effect ( $p \leq .01$ ) on GPA score; -0.0454. This results are illustrated in column one of Table 4.7 below.

*Gender.* Female students who participated in the FIG program had a lower cumulative GPA compared to male participants (see column two of Table 4.6). Female gender status had a statistically significant negative interaction ( $p \leq .01$ ) on the mean GPA scores of FIG participants. The mean GPA score of female participants decreased by -0.0763. This result suggests that the gender variable, female, negatively influenced the achievement outcome effect of FIG participation or something was different about the females who self-selected to participate in the FIG program compared to those who did elect to participate.

*Race, Pre-Collegiate Academic Achievement, and Educational Preference.* Race, pre-collegiate academic achievement score, and educational preference status of FIG participants were not found to have a statistically significant interaction on the mean GPA scores of FIG participants. This finding is important because these variables were shown in the results presented in Table 4.5 to have an effect on the academic achievement scores of the sample when FIG participation status was disregarded. The statistically significant negative effect that the variables, Black, Hispanic, and STEM status had on academic achievement in the regression analysis conducted for Table 4.5 was no longer significant when looking only at academic achievement among students who participated in the FIG program. This finding suggests that the FIG program negates some of the negative influence the Black, Hispanic, and STEM variables were found to have on academic achievement. Likewise, pre-collegiate academic achievement quartiles and persistence in college beyond the point of matriculation were no longer found to have a significant interaction on the outcomes of FIG participants' academic achievement scores.

**Table 4.7 Interaction Effects of FIG on Academic Achievement**

Took FIG	-.0454** [0.0115]	-.0009 [0.0189]	-.0371** [0.0128]	-.0440** [0.0131]	-.0287 [0.0217]
Female*FIG		-.0763** [0.0237]			
Asian*FIG			-.0572 [0.0715]		
Black*FIG			0.0067 [0.0446]		



**Table 4.7 - continued**

Hispanic*FIG							-0.0575 [0.0387]		
STEM*FIG								-0.0057 [0.0274]	
Pre-Collegiate GPA 2nd Quartile*FIG									0.025 [0.0328]
Pre-Collegiate GPA 3rd Quartile*FIG									-0.0438 [0.0308]
Pre-Collegiate GPA 4th Quartile*FIG									-0.0534 [0.0311]
Demographics	X	X	X	X	X	X	X	X	X
STEM Major	X	X	X	X	X	X	X	X	X
High School GPA	X	X	X	X	X	X	X	X	X
School Year Fixed Effects	X	X	X	X	X	X	X	X	X
Constant	2.7779** [0.0103]	2.7741** [0.0104]	2.7770** [0.0103]	2.7778** [0.0103]	2.7761** [0.0104]				
Observations	34934	34934	34934	34934	34934				
R-squared	0.2	0.2	0.2	0.2	0.2				

Robust standard errors in brackets

\* significant at 5%; \*\* significant at 1%

#### Institutional Persistence

A regression analysis was conducted using institutional reenrollment rates from the subjects' second, fourth, and fifth semesters of college enrollment; summers omitted. Analysis for only those students who participated in the FIG program indicated that as a whole, there was no statistically significant interaction between FIG participation on the rate of institutional persistence as shown in column one of Table 4.8.

*Gender.* The gender identity of FIG participants was not found to have a statistically significant interaction on the level of the FIG participants' level of academic achievement as measured with by cumulative GPA scores as seen in Table 4.8.

*Race.* As regards race, the variable, Black was shown to have a statistically significant negative interaction ( $p \leq .05$ ) effect on the persistence rate of FIG participants. Column three of Table 4.8 indicates that FIG participants identified as Black had statistically lower (-0.0579) rates of persistence. This finding is inconsistent with the findings presented in Table 4.6 which indicated that regardless of FIG participation status, Black students had statistically higher persistent rates (0.0303). This result suggests that something is different about the Black students who self-select to participate in the FIG program or that the program influences their retention in a negative way that did not influence other race groups.

*Pre-Collegiate Academic Achievement.* In column five of Table 4.8, the analysis shows that there was a statistically positive interaction ( $p \leq .01$ ) of FIG participation for subjects with pre-collegiate achievement scores in the second quartile (0.0288). Results presented in Table 4.6 show that regardless of FIG or non-FIG participation subjects in the third, second, and first (highest to lowest) quartiles of pre-collegiate academic achievement scores all had statistically significant positive differences in their persistence scores compared to the lowest group. When a regression analysis was conducted only for subjects who participated in the FIG program, only those in the second quartile still showed a significantly positive rate of institutional persistence.

*Educational Preference.* There is a statistically significant positive interaction ( $p \leq .05$ ) of FIG participation and enrollment in the STEM curriculum area on rate of institutional persistence. The persistence rate of STEM FIG participants increased 0.0117 compared to non-STEM FIG participants. This result is contrary to the information presented in Table 4.6, which indicated that STEM students, regardless of FIG participation status, had statistically negative rates of persistence (-0.0180). This finding suggests that there was either was something different about the STEM students who self-selected participation in the FIG program or that the FIG program has a significantly positive interaction on the persistence rates of those students; something that the STEM students did not gain or benefit from outside of FIG participation.

**Table 4.8 Interaction Effects of FIG on Institutional Persistence**

Took FIG	-0.0089	-0.0035	-0.0039	-0.0142*	-0.0093
	[0.0048]	[0.0073]	[0.0054]	[0.0058]	[0.0073]
Female*FIG		-0.0092			
		[0.0099]			
Asian*FIG			-0.0174		
			[0.0290]		
Black*FIG			-0.0579*		
			[0.0257]		
Hispanic*FIG			-0.0091		
			[0.0148]		
STEM*FIG				0.0177*	
				[0.0084]	
Pre-Collegiate GPA 2nd Quartile*FIG					0.0288**
					[0.0092]
Pre-Collegiate GPA 3rd Quartile*FIG					-0.0115
					[0.0125]
Pre-Collegiate GPA 4th Quartile*FIG					-0.0166
					[0.0154]
Demographics	X	X	X	X	X
STEM Major	X	X	X	X	X
High School GPA	X	X	X	X	X
School Year Fixed Effects	X	X	X	X	X
Observations	39050	39050	39040	39050	39050
Pseudo R-Square	0.12	0.12	0.12	0.12	0.12

Robust standard errors in brackets

\* significant at 5%; \*\* significant at 1%

### Summary

The purpose of this study was to assess the longitudinal impact of the Freshmen Interest Group (FIG) program on students' academic achievement and institutional persistence at Big

Dog University. This study was causal-comparative, using existing educational data to determine what effect participation in a FIG program has on academic achievement and institutional persistence. Statistical analysis was also conducted to determine what interaction exists between the effect of FIG participation and the study's control variables (gender, race, pre-collegiate academic achievement, and educational preference). The study's independent variable was subject participation in the FIG program. The dependent variables were academic achievement and institutional persistence. Academic achievement was measured by the participants' cumulative non-weighted institutional grade point average (GPA) at specified points during college enrollment. Institutional persistence was measured by rate of subject reenrollment at the same institution over time.

The study included data for 4,101 students who matriculated at Big Dog University in the Fall 2005 Semester and 3,716 students who matriculated in the Fall 2006 Semester; data obtained from BDU's Office of the University Registrar. The study's sample consisted of 7,809 students; 644 who self-selected participation in the FIG program and 7,165 who did not. The mean pre-collegiate GPA score for students who participated in the FIG program was 3.61 opposed to 3.65 for students who didn't participate in the program. The sample resembled the overall population of students at the University.

Regression analysis was used to determine what effect FIG participation had on the subjects' academic achievement and institutional persistence outcomes. Results showed that the FIG program had a statistically significant positive effect on the mean GPA score of participants. The study's model was informed by what was known about the effects of student demographic variables, pre-collegiate academic preparation, and educational preference, and duration of time spent enrolled at the institution has on student achievement. The analysis controlled for these factors to help understanding what influence these variables may have on academic achievement and the effect of FIG participation on that outcome.

Examining how sub-groups of students defined by their gender, race, pre-collegiate GPA score, educational preference (STEM or non-STEM) fared in terms of academic achievement regardless of FIG participation, the analysis showed that females had statistically significant higher GPA scores. Black students had statistically lower GPA scores and Hispanic students had

statistically higher scores. The GPA scores of STEM majors were statistically significantly lower compared to non-STEM peers. Students with pre-collegiate GPA scores found in the second, third, and fourth quartiles all had statistically higher mean GPA scores for collegiate academic achievement over those in the first quartile. The analysis showed that the length of time a student was enrolled at the institution had a statistically significant positive effect on the mean academic achievement scores of the study's sample. This effect was increased positively as the length of time a student spent enrolled increased. The length of time a student spends enrolled at the institution was also correlated with higher academic achievement scores.

Students who participated in the FIG program had lower rates of institutional persistence compared to students who did not participate in the program. The FIG program had a statistically significant negative effect on the persistence rate of FIG participants. A regression analysis using the study's full model controlled for confounding variables and found that the FIG program did not have a statistically significant effect on the rate of institutional persistence.

Examining how sub-groups of students as defined by gender, race, pre-collegiate GPA score, educational preference (STEM or non-STEM) fared in terms of institutional persistence regardless of FIG participation, the analysis found that females had statistically significant lower rates of persistence. Black students had a statistically higher rate of persistence over other racial groups. Students with pre-collegiate GPA scores found in the third, second, and first (lowest to highest) quartiles all had statistically higher rates of institutional persistence compared to students in the first quartile. The analysis controlled for the length of time subjects had been enrolled at the institution. The results indicate that the length of time a student was enrolled at the institution had a statistically significant negative effect on the students' rate of persistence.

Female students who participated in the FIG program had lower cumulative GPA scores compared to male participants. Race, pre-collegiate academic achievement scores, and educational preference status of FIG participants was not shown to have a statistically significant interaction on the mean GPA scores of FIG participants. This finding is important to the study because these variables as presented in Table 4.5 appeared to have an interaction effect on the academic achievement of students in the sample when FIG participation status was disregarded. The statistically significant negative effect on Blacks, Hispanics, and STEM participants'

academic achievement in the regression analysis as seen in Table 4.5 was no longer significant when looking only at the academic achievement scores for students who participated in the FIG program. Likewise, pre-collegiate academic achievement quartiles and duration of enrollment in college after matriculation were no longer shown to be variables that have a significant interaction on the outcomes of FIG participants' academic achievement scores.

Regression analysis found that as a whole there was no statistically significant interaction between FIG participation and the rate of institutional persistence. Gender of FIG participants was not found to have a statistically significant interaction on the level of the FIG participants' level of academic achievement when measured by cumulative GPA scores as seen in Table 4.8.

With regard to race, Black students were found to experience a statistically significant negative interaction effect on their persistence based on FIG participation. This finding is inconsistent with the results presented in Table 4.6 which indicated that regardless of FIG participation status, Black students had statistically higher persistent rates. There was a statistically positive interaction for FIG participation for students with pre-collegiate achievement scores in the third quartile (where one is the highest quartile and four is the lowest). Regardless of FIG or non-FIG participation subjects in the, third, second and first quartiles of pre-collegiate academic achievement scores, all had statistically significant positive differences in their persistence. Regression analysis found that subjects in the third pre-collegiate GPA quartile still demonstrated a significantly positive rate of institutional persistence.

FIG participants who enrolled in STEM majors were found to have a statistically significant positive interaction effect on their rate of persistence. This finding contradicts information presented in Table 4.6, which indicated that STEM students, regardless of FIG participation status, had statistically negative rates of persistence. These findings suggest that either something different about the STEM students who self-selected participation into the FIG program or that the FIG program has a significantly positive interaction on the persistence rates of these students; something that the STEM students did not gain or benefit from outside of FIG participation.

## CHAPTER FIVE

### SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Since the early 1900s, American higher education has been shaped by strong government and consumer demands for accountability (Burke, 1998). If policy trends witnessed in K-12 education are a predictor of future accountability expectations for higher education, limited funding will become even more tightly connected to perceived efficiency and effectiveness measures such as student retention, academic achievement, and standards of overall institutional performance (Bevc & Ursic, 2008).

As competition for federal and state support has increased, institutions have also needed to recruit more qualified students and garner greater public trust. These demands have prompted colleges and universities to develop strategies for proving the value of the enterprise and meet performance indicators required by accrediting bodies and institutional funding formulas. Retention rates, time-to-degree completion rates, and grade point averages are traditional criteria used to measure student performance and, therefore, institutional effectiveness.

Campus programs that support students' personal and academic development contribute to the likelihood of academic success and institutional persistence (Borden, 1999; Wawrynski & Jessup-Anger, 2010). At Big Dog University (BDU), a large research university in the Southeastern U.S., one strategy implemented to achieve such performance indicators is the Freshmen Interest Group program (FIG). The purpose of this study was to examine the FIG program as a means of improving the effectiveness of undergraduate education. For the purposes of this inquiry, effectiveness was gauged by performance indicators commonly used to denote educational quality, namely, the impact of the FIG program on student academic performance and institutional persistence. The effectiveness of academic enrichment programs in undergraduate education has been evaluated with various types of data, including student perceptions and attitudes, analysis of educational costs in relation to perceived value, the ratio of courses dropped to those completed, future course registrations, grade point averages, and student retention and persistence rates (Gordon & Hopkins, 1996; Smith & MacGregor, 2009).

As part of the attempt to improve student academic achievement and persistence, many institutions have developed first-year student support and academic enrichment programs

(Pascarella & Terenzini, 1991; Wawrzynski & Jessup-Anger, 2010). A considerable body of research indicates that various forms of student involvement, both inside and outside of the classroom, have a substantial positive effect on student academic development and higher education persistence (Astin, 1975, 1993; Pascarella & Terenzini; Rocconi, 2011).

Astin (1993) stated that, “Overall educational effectiveness can be ascertained by the amount of physical and psychological energy a student contributes towards his/her involvement in the college experience” (p. 365). The greater a student’s involvement, in both quantity and quality, with various aspects of the collegiate experience, academic and co-curricular, the greater the chances are that the student will achieve his or her educational goals and be satisfied with the educational experience, leading to a higher degree of academic achievement and increased likelihood of institutional persistence.

Non-residential learning communities, like the FIG program, are designed to encourage the type of campus engagement Astin (1993), Pike, Kuh, and McCormick (2011) described. In particular, the FIG program encourages student interaction with peers, faculty, and staff in the college environment, the development of healthy study skills, co-curricular involvement, and academic engagement. This study examined what effect, if any, the FIG program has had on specific institutional performance indicators, academic achievement and institutional persistence. By measuring these indicators for students who participate in the FIG program and those who do not, better use can be made of any effect the program may have on the effectiveness of undergraduate education.

### **Summary of Findings**

Four research questions guided this study:

- What difference, if any, are there between the academic achievement and institutional persistence of students who participated in BDU’s FIG program and students who did not participate in the program?
- If there are differences in academic achievement or institutional persistence between students who participated in BDU’s FIG program and those students who did not, do the differences vary based on gender or race?



- If there are differences in academic achievement or institutional persistence between students who participated in BDU's FIG program and those who did not, do the differences vary based on pre-collegiate academic achievement?
- If there are differences in academic achievement or institutional persistence between students who participated in BDU's FIG program and those students who did not, do the differences vary based on educational preference (major choice)?

A t-test analysis of the study's sample was conducted to determine if a difference in pre-collegiate academic achievement (GPA) scores existed between FIG and non-FIG students. There are criticisms in the literature which state that optional enrollment in enrichment programs like the FIG program will present an inherent self-select or "halo effect" in the data. Such effects frequently assumes that students who self-enroll in enrichment programs are more academically prepared or motivated than students who do not enroll. T-test results found that FIG participants had lower pre-collegiate GPA scores than non-FIG participants, but the difference (-0.0430) was not statistically significant. The subjects' probability of enrollment, based on control variable characteristics, was also conducted.

While female, Black, and Hispanic students were significantly more likely to enroll in the FIG program, they also had significantly lower pre-collegiate GPA scores than males and other peer race groups. Similarly, non-STEM students were significantly more likely to participate in the FIG program and they had lower pre-collegiate GPA scores. Students with pre-collegiate GPA scores in first quartile range, represent the lowest of scores from the study's full sample. Students in quartiles two through four were significantly less likely to participate in the FIG program. A regression analysis model was developed which accounts for subject race, gender, pre-collegiate academic achievement, and education preference variables was used to understand what influence those factors have on academic achievement or institutional persistence outcomes. That model also allowed for the researcher to conduct an analysis of what effect FIG participation has on these outcomes and how that effect may be influenced by subject race, gender, pre-collegiate academic achievement or educational preference.

*Research Question One.* The FIG program was found to have had a statistically significant positive effect on the mean GPA score of program participants. Examining how sub-

groups of students defined by their gender, race, pre-collegiate GPA score, educational preference (STEM or non-STEM) fared in terms of academic achievement regardless of FIG participation, the results showed that females and Hispanic students had statistically significant higher academic achievement (GPA) scores. Black students had statistically lower GPA scores. The GPA scores of STEM majors were statistically significantly lower and students with pre-collegiate GPA scores in the second, third, and fourth quartiles all had statistically higher mean GPA scores for collegiate academic achievement than those in the first quartile.

The regression model also controlled for the length of time subjects have been enrolled at the institution. Results show that length of time a student was enrolled at the institution had a statistically significant positive effect on the mean academic achievement scores of the study's sample. This effect was compounded positively as the length of time a student spent enrolled increased. The length of time a student spent enrolled at the institution correlated with higher academic achievement scores; an effect thought to be caused by a shift from the general studies curriculum to the students' majors, the attrition of less academically qualified or motivated students, and increased development of coping and other soft skills which support academic success.

When not controlled for subject demographic variables, pre-collegiate achievement, or educational preference, those who participated in the FIG program had statistically lower rates of institutional persistence. When those variables were controlled for in the full analysis model, the FIG program was found not to have a statistically significant effect on the rate of institutional persistence. Examining how sub-groups of students defined by their gender, race, pre-collegiate GPA score, educational preference (STEM or non-STEM) fared in terms of institutional persistence regardless of FIG participation, the analysis showed that females had statistically significantly lower and Black students has statistically significantly higher rates of persistence. The persistence rate of STEM majors was found to be statistically lower compared to non-STEM peers. Students with pre-collegiate GPA scores found in the second, third, and fourth quartiles all had statistically higher rates of institutional persistence compared to students in the first quartile. Students from the first quartile were statistically more likely to self-select participation in the FIG program. They also had the highest pre-collegiate GPA scores.

The analysis model also controlled for the length of time subjects have been enrolled at the institution. The length of time a student was enrolled at the institution had a statistically significant negative effect on the rate of persistence for the study's sample. Logic supports that the longer students are enrolled at the institution the greatest the chance they have to drop out or otherwise discontinue their enrollment because of personal or academic reasons. Thereby the negative effect was compounded based on length of time subjects were enrolled from the point of matriculation.

The remaining research questions examined the heterogeneity of FIG participation effect on subject academic achievement and institutional persistence based on the interaction of race, gender, pre-collegiate academic achievement, and educational preference variables. A regression analysis which controlled for these variables was used to answer research questions two through four.

*Research Question Two.* In regard to academic achievement, males who participated in the FIG program had significantly higher grade point averages than females who participated in the program. This finding was contrary to what was shown in question one for the study's full sample when FIG participation was not controlled for in the analysis. Race was not found to have a statistically significant influence on the effect FIG participation had on the subjects' academic achievement. In regard to institutional persistence, the variable, gender, was not found to have a statistically significant interaction on the persistence of FIG participants.

There was a statistically significant negative interaction between FIG participation and the persistence rate of Black students. This finding is important to note because analysis found that in the entire sample, regardless of FIG participation status, Black students had statistically significant higher rates of institutional persistence over peers in other race groups. This result suggests that Black students who self-selected participation in the FIG program were different or the FIG program impacted them differently than it did any other race group.

*Research Question Three.* The pre-collegiate academic achievement score of subjects' was not found to have a statistically significant interaction effect on the participants' collegiate achievement (GPA) score. Analysis results found that a statistically significant positive interaction between pre-collegiate achievement scores in the second quartile and the effect FIG

participation had on institutional persistence. Analysis found that regardless of FIG participation, subjects in the second, third, and fourth quartiles of pre-collegiate academic achievement scores all had statistically significant positive differences in their persistence scores. When the regression analysis was conducted only for subjects participating in the FIG program, only those in the second quartile exhibited a significantly positive rate of institutional persistence.

*Research Question Four.* The educational preference (STEM or non-STEM major choice) of FIG participants did not have a statistically significant interaction effect on participants' academic achievement. This finding was important to the study because this variable was found to have had a statistically significant negative influence on the academic achievement scores of the study's population when FIG participation status was disregarded. This result suggests that the FIG program negates some of the negative influence STEM status has on the academic achievement of subjects. FIG participation was also found to have a statistically significant positive interaction on the rate of institutional persistence of STEM majors. This finding was contrary to the earlier analysis which showed STEM major had statistically negative rates of persistence (-0.0180). This finding suggests that there either was something different about the STEM students who self-selected participation in the FIG program or that the FIG program has a significantly positive interaction on the persistence rates of those students; something that the STEM students did not gain or benefit from outside of FIG participation.

## **Discussion**

The purpose of the study was to examine what longitudinal effect participation in the FIG program had on academic achievement and institutional persistence and what interaction gender, race, pre-collegiate academic achievement, and educational preference variables have on those effects. Results of this study led to the below conclusions.

### **Academic Achievement**

Congruent with the information presented in the literature review, the study found that participation in the FIG program presented mixed results in regards to influencing the academic achievement of FIG participants over non-FIG participants. Results show that as a whole, the academic achievement of subjects participating in the FIG program benefited from a statistically

significant positive effect. Subjects achieved higher cumulative grade point averages over time. These results are similar to those found by Borden, Buron, and Evenbeck (1999) in their survey of data related to students' participation in introductory curriculum tracks which foster community development in tandem with academic engagement versus peers who were not enrolled in similar programs.

The degree of the FIG program's effect on the educational effectiveness outcomes (academic achievement and institutional persistence), direction of its orientation, and whether it was statistically significant or not varied based on the demographic, educational preference and pre-collegiate achievement characteristics of subjects. Consistent with the research conducted by Davis et al. (1996), Bae et al. (2000), and Sadker and Sadker (1994), the present study found that female participants had a statistically significant higher academic achievement level than their male peers. Study findings were consistent with the research outcomes of Baker and Jones (1993), who asserted that female students' have increased levels of academic achievement when provided learning environments that foster community interaction and varied instructional styles. Sandler, Silverberg, Hall (1996), and Sax et al. (2005) predict that women will out-achieve men when engaged by educational environments that reinforce relationships over competition.

An analysis conducted of the academic achievement scores of the entire sample, which controlled for race identity but not FIG participation, showed that Black had statistically significant lower levels of achievement and Hispanic students has statistically higher levels of achievement. When this analysis was conducted with a control in place for FIG participation, neither of the findings remained at their level of significance. These results suggest that if all other characteristics of the sampled students are equal, the FIG program did help to increase the level of academic achievement for Black students but had an opposite influence on the achievement of Hispanics. This finding was in keeping with research conducted by Love (1993), Roscigno and Ainsworth-Darnell (1999) who found that Black students often struggle with academic achievement during the undergraduate college experience due to lack of academic preparation and a lack of support during the collegiate transition.

The results of this study also found that students choosing to study in STEM (science, technology, engineering, and mathematics) curriculum areas had statistically significant lower

grade point average scores compared to non-STEM students. When comparing FIG participants to the full population, the finding was no longer statistically significant. While STEM FIG students still showed lower achievement scores than non-STEM FIG students, the fact that the result was no longer statistically significant suggests that the FIG program was an appropriate intervention for improving the academic success of the STEM subjects. This finding supported the predictions made by Davis et al. (1996) and Belcheir's (2000) research.

Analysis of how a FIG participant's level of pre-collegiate academic achievement, as determined by their cumulative high school GPA score, interacts with collegiate academic achievement and institutional persistence presented interesting results. While higher pre-collegiate academic achievement was found to be a statistically significant positive predictor of the collegiate achievement of student in the full sample, this effect was no longer statistically significant when analyzing the interaction for FIG participants only. This result may be attributed to the lower mean cumulative GPA score of FIG participants over non-participants, less academic motivation in FIG participants over time, or that the FIG program somehow had a negative interaction with the longitudinal academic achievement of students based on their pre-collegiate achievement score.

Some researchers argued that students who are more prepared or motivated academically would be motivated to self-select participation into engagement opportunities like the FIG program (Cresswell, 2005). Results in the present study found that the students who enrolled in the FIG program had a lower mean high school GPA score than students who did not enroll in the program. A definitive explanation for this occurrence cannot be made, but possible explanations include marketing, formal and informal, targeted towards academically less prepared students, perceived lack of prestige or understanding of the program by the higher pre-collegiate achieving students, and academic curriculum structures which discouraged higher pre-collegiate achieving students from participating in FIG. Finally, as the FIG program is viewed as a first-year engagement program, similar to living-learning communities and the honors program, chances are good that higher achieving students would take advantage of those other opportunities first, which make it less likely that they would also participate in the FIG program.

This study allowed the researcher to analyze pre-existing academic achievement data representing two and a half years worth of the FTIC students' experience at Big Dog University. Study results found that students who enrolled in the FIG program maintained a higher grade point average during this time than students who did not enroll in the course. These results were statistically significant with the greatest effect occurring in the seventh observation, which equated to the Fall semester of the subjects' third year. Analysis of the full sample showed that females had statistically higher GPA scores than males when FIG participation status was not controlled for in the model. For those participating in the program, the results of the analysis changed and females were found to have statistically lower GPA scores. Analysis not controlling for FIG participation also found that STEM and Black identifying students had statistically higher and Hispanic identifying students had statistically lower scores. Differences in the academic achievement scores of STEM, Black, and Hispanic students were no longer significant when controlling for FIG participation.

The interaction of gender, race, and educational preference variables on the effect of FIG participation on academic achievement is mixed. This finding suggests that sub-populations of subjects are impacted differently by their participation in the FIG program or that something is different about the students from these subgroups who are selecting to participate in the program. The variation of effect may have been the result of participant self-selection. Further study is needed to determine if the students were otherwise less academically qualified or motivated for higher education. The fact that STEM and female student achievement is shown to improve when participating in the FIG program is encouraging and suggests that with more understanding of the participant effect, the FIG program has potential to increase the academic achievement of those at risk populations.

The inconsistent statistically significant positive effect of FIG participation on the academic achievement of subjects' with lower cumulative high school scores was consistent with research conducted by Belcheir (2000), Pascarella, Terenzini (2005), Smith, and MacGregor (2009). Students in the first and third quartile ranges are assumed to be pre-disposed to higher collegiate achievement based on pre-collegiate academic readiness. Not surprisingly, consistent with these studies, FIG participants from those quartile groups were found to have higher college

achievement scores as were non-FIG participants from those quartiles. With more study, this result suggests an opportunity to improve the academic achievement of another at risk group; those who matriculate with lower pre-collegiate high school achievement scores.

#### Institutional Persistence

A regression analysis of what effect FIG program participation had on students' institutional persistence indicate that students who participate in the FIG program are less likely to be retained than students who do not participate in the program. These findings on the institutional persistence of students are counter to the research findings of Astin (1985), Baird (1976), Borden, Burton, Evenbeck (1999), Porter, and Swing (2006). Those studies found that subjects should be more likely to successfully integrate into the academic and social environment of the institution because the FIG program introduced participants to activities and resources which promote academic and extracurricular development. Tinto's (1997) theory of student departure asserted that students are more likely to remain at an institution if they integrate academically and socially into their new community. A t-test analysis found that FIG participants have lower pre-collegiate mean GPA scores than the full study sample, this fact or other unknown information regarding how the FIG program impacted the retention of participants point to a reason for this unexpected finding.

This study's finding related to institutional persistence does not correlate with the research findings by Tinto (2005). This contradictory finding may also have been due to the effects of participant self-selection; students who self-selected to participate in the FIG program had lower mean high school GPA scores. Pascarella, Terenzini (2005), Pike, Saupe (2002), Ishler, Upcraft (2005), Wawrynski, and Jessup-Anger (2005) found that the most powerful predictor of academic achievement and persistence at the college level is academic readiness. Strong pre-collegiate academic achievement is commonly characterized by high standardized test scores and/or grade point averages in pre-collegiate coursework (Pascarella & Terenzini, 2005). It was assumed by the researcher, based on the study's findings and current literature that the lower high school GPA scores disadvantaged FIG participants for institutional persistence regardless of their participation in the FIG program. The FIG program, quite simply, was not a strong enough intervention to effect a positive change in the rate of re-enrollment.



While the FIG program was not found to have statistically significant effect on the institutional persistence of FIG participants compared to non-participants when analyzed in the aggregate, there were some differences in effect when demographic, pre-collegiate achievement and educational preference subgroups were controlled for in the regression model. FIG participation had a statistically significant negative effect on the institutional persistence of Black students and a positive effect for STEM majors and those with pre-collegiate achievement scores in the second quartile. This is incongruent with the findings of D'Augelli and Hershberger (1993), Jones (2001), and Rocconi (2011) who point to mentoring and curriculum individualization as a means of improving the academic success of students. Not controlling for FIG participation status, Black students had significantly higher rates of reenrollment. The fact that Black students has statistically lower reenrollment rates when participating in the FIG program is an important finding, especially for policy makers and those in institutional leadership. Similarly, the fact that the FIG program was found to be an effective means of improving the persistence of STEM students was an important finding that has potential for institutions looking for avenues by which to improve STEM student retention.

There was a statistically significant positive effect of FIG participation on the institutional persistence rate of subjects who had a high school GPA in the second quartile group. When full set of data was analyzed, regardless of FIG participation status, the persistence rate of students was highest among the third and fourth quartile groups, which were the lowest pre-collegiate achievement means. Controlling for FIG participation in the analysis, results for only the second quartile group had positive statistical significance. The finding that FIG participation has the greatest impact on the re-enrollment rate of students entering college with less academically competitive high school GPA scores was similar to the research findings of Borden, Burton, and Evenbeck (1999), and Kuh et al. (2006). Students introduced to academic and co-curricular support resources and programs are engrossed into the academic community at a faster rate than students who do not benefit from intentionally focused initiatives (Gablenick, MacGregor, Matthews, & Smith (1990); Wawrzynski & Jessup-Anger, 2010).

As the participants with high school GPA scores in the first quartile require the least growth needed to develop the interpersonal and academic success skills needed for persistence in

higher education, it seems appropriate that reenrollment rate of subjects in lower ranges, like those in second quartile group of this study, showed a greater effect from participation in an intervention program like the FIG program which focused on that type of development. As institutions are interested in improving persistence rates, the findings presented by this study suggest that the FIG program has the potential to improve reenrollment rates of students in STEM programs those in the lower pre-collegiate achievement quartiles; both shown to be at risk populations in the analysis of the full sample and review of related literature.

In examining the impact of the FIG program over the course of two and a half years among students in 2005 and 2006 entering classes, it was determined that students who participated in FIG were retained at a lesser rate than students who did not participate in the course. These results were statistically significant for the first year and a half of the students' academic experiences, or during the first three analyses that were conducted. Again, these findings are inconsistent with findings of Astin (1985), Baird (1976), Borden, Burton, Evenbeck (1999), Porter, and Swing (2006), and others in the field who found participants in similar types of programs to have significantly higher retention rates than non-participants over three years. The conflict between the study's findings and what is commonly understood in the literature as the expected outcome for student participation in early engagement programs suggests that participant self-selection error and/or curriculum content deficiencies were present which resulted in these skewed effects.

The other statistically significant effects identified for demographic sub-groups of participants during the first year, negative effect in re-enrollment rates of Black students, positive reenrollment effect for STEM majors and positive re-enrollment effect for students in lower high school GPA score quartile bands, suggest potential use of the FIG program as a means by which institutions can influence the persistence of at risk groups. Replication of the study and further analysis would be warranted before drawing such strong conclusions.

Findings also suggest that participation in the FIG program may impact a student's long-term retention at an institution as a result of the student making early resource, support, and social connections that promote academic and social development. This benefit, however, may be diminished, negated, or even reversed based on demographic characteristics in the students'

profile or by certain educational preference choices, such as major. This possibility aside, the strongest predictor of academic success, noted by both academic achievement and institutional persistence, in a students' first collegiate year remains academic readiness and pre-collegiate preparation when students did not complete the FIG, an example of a student success engagement program (Astin, 1997; Isher & Upcraft, 2005; Pascarella & Terenzini, 2005; Wawrynski & Jessup-Anger, 2010). This result was found in the current study through the analysis of participant and non-participant high school GPA scores, FIG participant status, and longitudinal re-enrollment rates.

### **Implications and Recommendations for Practice**

From the results presented in this study, a number of recommendations can be made with regard to the continued development of the Freshmen Interest Group (FIG) program. These recommendations may aid first-time-in-college (FTIC) students during their transition to college by improving their academic achievement and institutional persistence in addition to the perceived educational quality of their institution. Based on what is now known about the types of students self-selecting participation in the FIG program and the inconsistent way in which sub-groups benefit or not from participation, marketing strategies should be developed which target the groups shown to benefit the most from intervention.

Institutions have historically struggled with STEM majors in terms retention rates, length of time to degree completion, and levels of academic achievement (Nelson & Rogers, 2004). STEM students in this study's sample had significantly lower academic achievement scores and persistence rates compared to non-FIG students while in college. STEM students who participated in the FIG program had higher achievement scores compared to those who did not participate. Study results also suggested that the FIG program will have a statistically significant positive impact on the persistence rate of STEM students. Given this information, institutional policy makers should leverage the use of FIG program to increase the academic success of STEM students by requiring or incentivizing participation. Likewise, much study has been made of the collegiate achievement gap which exists between Black students and other racial groups. The results of this study found that Black students participating in the FIG program had gains in their cumulative academic achievement scores. With more study of non-residential learning

communities, especially the FIG program, administrators may be able to narrow the achievement gap.

Because the results on academic achievement were mixed for some demographic groups, males and students of color, the institution should re-engage itself in a conversation about the curriculum strategies, resources, and informal community messages that shape the success of at risk populations. It is recommended that the FIG program implement the findings presented in Astin (1996), King (2000), and Rocconi's (2011) research which includes bolstering academic skills education along with the quality and quantity of peer mentoring interactions that would assist students develop effective study habits and coping skills that promote positive academic performance, particularly in the first year of enrollment. While this study did not focus on the role of peer to peer relationships or instructor mentoring in influencing student success and academic motivation, research that has proven these to be effective strategies for promoting collegiate success of at risk groups (Belcheir, 2000). The FIG program should use these strategies to leverage the full effect possible for at-risk students participating.

In terms of institutional persistence, the study's findings were interesting because they presented results counter to what was anticipated based on literature regarding the topic. FIG students, as an aggregate group, are significantly more likely to lower academic achievement scores compared to their counterparts who did not participate in the program, but there was not a statistically significant impact on persistence. Again, this effect seems to be a result of participant self-selection. It is again recommended that decisions be made about who the program is marketed to and which educational outcomes are most desirable by the institution as a result of participation. The study results show that, on average, students with lower high-school GPA scores and those of color benefited from greater re-enrollment gains because of their participation in the FIG program. Because STEM students at BDU had a significant increase in their enrollment rate when they participated in the FIG program, the institutional policy makers should require, not recommend or simply make available, the FIG program to students known statistically not to achieve or persist at the same level as their peers.

The study's findings illustrate that more should be done to assist all student groups to have a successful academic transition to college, especially as it relates to gender, race and

educational preference (major choice). The study showed that the persistence rates of students based on gender and race vary greatly during the first three years of enrollment. The academic achievement of females actually had a statistically significant negative effect because of FIG participation; contrary to the statistically positive interaction that female gender status had on academic achievement in the sample for subjects not participating in FIG. There are similar mixed results related to the retention of students of color. These skewed findings warn that more must be done to understand how the self-selection effect of participants or the specific curriculum being used in the FIG program shaped the study's results; understanding this may further uncover ways that particular sub-groups enrolled in the program in different proportions or benefited from participation differently.

The literature stresses the important of the students' first-year in developing successful academic skills and coping strategies, pointing to this phase of enrollment as a time when the greatest periods of attrition can occur for at risk populations (Astin, Tsui, & Avalos, 1996; Rocconi, 2011). Results showed that some student populations exhibit greater persistence declines after the first year and a half. The researcher recommends that the FIG program provide more emphasis on helping students develop longitudinal academic plans that can guide students beyond the first year's semester of FIG participation. Given that a positive correlation was identified between participation in the FIG program, an example of a non-residential learning community, and educational outcomes for some students, administrators should investigate the feasibility of expanding the program to include a larger percentage of the institution's first-year students. It is also recommended that administrators consider expanding the program to serve second-year students. Literature often defines second-year students as a forgotten population on the college campus (Tinto & Pusser, 2006). The use of a FIG or a FIG-like program with second-year students would serve as a relatively lower-resource heavy program for the purpose of further engaging undergraduate students in activities which promote student success.

Goal setting and integration of the students' academic advisor in the development of a long term academic or career plan with the resources appropriate at developmental milestones and period of crisis or conflict would be helpful for students who are still acquiring coping skills appropriate for the personal and academic challenges faced in their higher education career.

Incentives that promote retention of the informal peer mentoring and support structures found in the FIG program's semester of implementation would also be beneficial in helping at risk populations that struggle in terms of academic achievement or persistence later in their academic careers.

It is recommended that the FIG program examine increasing the participation of more diverse faculty members, if in fact they are not already diverse, in terms of academic discipline, gender, and race, into instructional and mentoring roles with the program. As STEM majors and females were less inclined to self-select participation in the FIG program than non-STEM majors and males, it is believed that having more instructors participate who are representative of these groups will help support, formally and informally, these underrepresented groups and thereby result in greater participation by underrepresented groups that are not participating in the program as frequently as other groups. Greater participation, by mandate or incentive, in the program by students known to be positively affected, in terms of academic achievement or institutional persistence, by FIG program participation would result in a higher transfer rate of the FIG program's positive effects when applicable.

### **Recommendations for Future Research**

Based on the findings of this study, recommendations for future research include:

1. This study examined the effect the Freshmen Interest Group (FIG) program had on academic achievement and institutional persistence of students during their first semester of college and longitudinally over time. Replication of the study could provide additional insight regarding the impact of such programs on student success and what interactions occur between students' demographic characteristics, educational choice, pre-collegiate achievement, and the desired educational outcomes (increased cumulative grade point average scores and institutional re-enrollment rates).
2. The study was qualitative and causal-comparative in its design. A better understanding of the role that peer relationships, smaller class sizes, linked course curriculums, and other aspects of the FIG course play in motivating student achievement should be attempted through the use of qualitative assessment of the FIG program. Additional meaning might also be made about what creates student satisfaction and what variables influence student

motivation differently during later years of college attendance that are not present in the first year.

3. Because this study did not examine the roles FIG course instructors or peer leaders play in influencing the positive or negative achievement and persistence gains of their students, future research should attempt to determine what effect these groups may have on the study results, including what constitutes an effective or ineffective instructor or peer leader outside successful completion of the required training program.
4. As research by Astin (1993), Pike, Kuh, and McCormick (2011) has shown, student satisfaction, motivation and academic achievement can be equally influenced by out of class events and engagement opportunities as they are by in-class experiences. Therefore, future research should examine how levels of student outside engagement, including but not limited to organizational involvements, employment, and family and friend support interplay with FIG participation to impact achievement and institutional re-enrollment.
5. Qualitative or quantitative research means should be used to capture what factors students identify as being the most influential in their decision to not continue with enrollment and why or why not students used various support services available to them at the institution before and while making that attrition decision.

Based on the results of this study, a case can be made for the significant effect of non-residential learning communities in the first-year of college can have on longitudinal academic achievement and institutional persistence over the course of a student's undergraduate experience. Courses like the FIG program, which support the development of these communities, can provide numerous academic and personal satisfaction benefits for the both the institution and for participating students.

This study attempted to examine the longitudinal effect of a non-residential learning community program at a major research institution. As shown in the research findings, the FIG program at BDU demonstrated positive short-term and long-term achievement gains for the participating students in most areas. There were mixed results, however, which prove that there is no "one size fits all" approach which similarly influences student achievement and persistence.

This study's findings are congruent with similar research that emphasizes the role of community, environment, and fit as key factors which influences student success over time (Blimling & White, 1999; Smith & MacGregor, 2009). This is once again the most important factor when engaging support interventions which will influence the success of historically underrepresented or disadvantaged populations in higher education, such as women and students of color. While the FIG program may be of a positive or negative effect to the aggregate, first-time-in-college population, sub-populations based on demographic, educational choice, or pre-collegiate achievement variables may have a varied effect.

Regardless, non-residential learning communities such as the FIG program at BDU provide many benefits that cannot be captured in a quantitative study such as this study. To fully understand what impact the FIG program and others like it have on the academic experience of students, a qualitative exam should be conducted in addition to replication of this study's quantitative regression model. It is recommended that other large research institutions investigate implementing similar programs as a means of enhancing their first-time-in-college student experience, while at the same time increasing the academic achievement and an interconnectedness of the undergraduate student experience, especially that of STEM majors and females who otherwise have shown academic achievement and retention deficiencies.



## APPENDIX A

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

### APPROVAL MEMORANDUM

Date: 10/7/2010

To: Patrick Heaton

Dept.: EDUCATIONAL LEADERSHIP

From: Thomas L. Jacobson, Chair

Re: Use of Human Subjects in Research  
EFFECT OF A NON-RESIDENTIAL LEARNING COMMUNITY ON ACADEMIC  
ACHIEVEMENT AND INSTITUTIONAL PERSISTENCE

The application that you submitted to this office in regard to the use of human subjects in the proposal referenced above have been reviewed by the Secretary, the Chair, and two members of the Human Subjects Committee. Your project is determined to be Expedited per 45 CFR Â§ 46.110(7) and has been approved by an expedited review process.

The Human Subjects Committee has not evaluated your proposal for scientific merit, except to weigh the risk to the human participants and the aspects of the proposal related to potential risk and benefit. This approval does not replace any departmental or other approvals, which may be required.

If you submitted a proposed consent form with your application, the approved stamped consent form is attached to this approval notice. Only the stamped version of the consent form may be used in recruiting research subjects.

If the project has not been completed by 10/4/2011 you must request a renewal of approval for continuation of the project. As a courtesy, a renewal notice will be sent to you prior to your expiration date; however, it is your responsibility as the Principal Investigator to timely request renewal of your approval from the Committee.

You are advised that any change in protocol for this project must be reviewed and approved by the Committee prior to implementation of the proposed change in the protocol. A protocol change/amendment form is required to be submitted for approval by the Committee. In addition,

federal regulations require that the Principal Investigator promptly report, in writing any unanticipated problems or adverse events involving risks to research subjects or others.

By copy of this memorandum, the Chair of your department and/or your major professor is reminded that he/she is responsible for being informed concerning research projects involving human subjects in the department, and should review protocols as often as needed to insure that the project is being conducted in compliance with our institution and with DHHS regulations.

This institution has an Assurance on file with the Office for Human Research Protection. The Assurance Number is IRB00000446.

Cc: Robert Schwartz, Advisor  
HSC No. 2010.4972

## APPENDIX B

**FIG Semester GPA Means by Race, Gender, STEM, Pre-College GPA**

	Semester 1	Semester 2	Semester 4	Semester 5	Semester 7
Male	2.93	2.89	2.98	2.99	3.03
Female	3.04	3.05*	3.09*	3.14*	3.19*
Asian	2.92**	2.84**	3.07**	3.26**	3.2**
Black	2.9**	2.89**	2.91**	2.98**	3**
Hispanic	2.93**	2.96**	3**	3.06**	3.13**
White	3.01**	3**	3.06**	3.07**	3.13**
STEM Major	2.82*	2.82*	2.95*	2.98*	3.04*
Non-STEM Major	3.05	3.04	3.08	3.11	3.15
Pre-Collegiate GPA 1st Quartile	2.71**	2.75**	2.85**	2.89**	2.94**
Pre-Collegiate GPA 2nd Quartile	2.98**	3**	3.05**	3.06**	3.1**
Pre-Collegiate GPA 3rd Quartile	3.14**	3.17**	3.19**	3.21**	3.23**
Pre-Collegiate GPA 4th Quartile	3.45**	3.45**	3.47**	3.47**	3.48**

\* significant at 5%;

\*\* F statistics reject equal means across groups

## APPENDIX C

### FIG Persistence Rates by Race, Gender, STEM, Pre-College GPA

	Semester 2	Semester 4	Semester 5	Semester 7
Male	.959	.861	.831	.768
Female	.953	.863	.823	0.76
Asian	1**	.864**	.773**	.773**
Black	.92**	.88**	.8**	.74**
Hispanic	.938**	.863**	.825**	.75**
White	.959**	.859**	.83**	.764**
STEM Major	.975	.857	.839	.758
Non-STEM Major	.948	.864	.823	.765
Pre-Collegiate GPA 1st Quartile	.949**	.819**	.784**	.722**
Pre-Collegiate GPA 2nd Quartile	.972**	.876**	.852**	.825**
Pre-Collegiate GPA 3rd Quartile	.965**	.887**	.862**	.825**
Pre-Collegiate GPA 4th Quartile	.975**	.918**	.902**	.864**

\* significant at 5%;

\*\* F statistics reject equal means across groups

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## **BIOGRAPHICAL SKETCH**

Patrick Heaton was born in Portsmouth, Virginia and raised in Central Florida. As a first-generation college student, he earned a bachelor's degree in elementary education from Florida State University. During his studies and play in and around Tallahassee, FL, he found his passion for higher education, humor, and the Seminoles. He next attended the University of South Carolina where he earned a master's degree in higher education administration. Patrick was called back to the gothic spires of FSU to earn his doctorate degree while working full-time in Florida State University's Division of Student Affairs. Patrick is motivated to achieve his goals so he can prove to the amazing students he has had the honor of meeting along his journey that you can do anything if you try hard enough, be true to yourself, and trust your friends. Patrick plans to continue working in student affairs so he can help other struggling dreamers find their calling; especially those who are lucky enough to bleed garnet and gold - WOOOOOOO!