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A Regression Analysis of a Local Freshman Interest Group Program at a Public University

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COLLEGE OF EDUCATION

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Faith Christine Graham

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Walden University
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Faith C. Graham

MS, Mercyhurst College, 2001

BS, North Park University, 1997

Doctoral Study Submitted in Partial Fulfillment

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Abstract

Freshmen Interest Groups (FIG) programs – peer support systems for entering students at a public university in the northeast – were believed to contribute to positive retention outcomes, but had not been evaluated to determine their impact on student retention. The rationale for this project study was the absence of formal evaluations to determine retention program effectiveness. The results are important to enrollment management staff and academic program coordinators whose job responsibilities are tied to student retention. Bean's nine themes of college student retention provided the conceptual framework for this study. Research questions considered the likelihood that retention and persistence to graduation outcomes are based on FIG participation, and the likelihood of retention when controlling for the nine themes. Regression analysis examined existing data on a sample of 4,098 students who started at the local campus and should have returned for the 3rd semester. Results showed that participation in the FIG increased the odds of retention by a factor of 1.37, and the odds of persistence by a factor of 1.74. Five of the nine themes – students' intentions, first-year GPA, housing status, school of enrollment, and ethnicity – had a significant impact on the likelihood of students' retention at the study site. The project study results informed an evaluation report which presents findings and offers recommendations to the administration at the study site. Understanding and promoting student retention and success is of utmost importance to those striving to affect social change through education, and a clear understanding of opportunities to support the development of responsible, productive, and prepared students have both local and far-reaching social change implications.

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Section 1: The Problem

Definition of the Problem

The local Freshman Interest Group (FIG) program follows the model described by Gabelnick, MacGregor, Matthews, and Smith (1990). That model links students in two or more courses and includes a peer mentoring component. Targeted toward first-year students with similar interests in potential majors, the local FIGs also provide a peer support system for entering students and are generally employed at large institutions. The local educational problem is the absence of evaluation data on the FIG program, which leaves the college without empirical evidence about the value and potential effectiveness of a program that has been perceived to have a positive impact on retention for over a decade. Campus administrators recognized the absence of empirical data related to FIG's impact on retention. For example, a conversation with the Director of Student Affairs, the senior administrator whose department oversees the FIG program, revealed that the only evaluation of the FIG program was done over 10 years ago, and that the data measured the academic integration, social integration, and institutional satisfaction of students enrolled in FIGs at that time. The effect of FIG participation on future enrollment was not measured (K. Miller, personal communication, June 4, 2012). Findings from a rigorous quantitative analysis of an established program serving a select population of freshmen may clarify the impact that the program has had on campus retention, as will be done in this study. The results of that analysis could then be used as a model to identify incoming freshmen who might benefit the most from involvement in similar support services during their first year of enrollment.

This project study evaluated the local FIG program at a 4-year college campus in the northeast region of the United States. Several retention programs exist on the campus, but there are varying degrees of assessment and follow-through relating to program improvement. A retention committee formed by the campus's Enrollment Management Group (EMG) reported in the fall of 2011 that the college had an 81% retention rate from second to third semester. The same retention committee report stated that it was not clear how this rate was achieved, and that with no standardized method of delivering campus retention programs, campus community administrators are left without an understanding of what any particular program contributes to freshman retention (Enrollment Management Group, personal communication, December 8, 2011).

The setting for this quantitative project evaluation was an individual campus within a large, multicampus, state-wide university system. Over 4,700 students on the campus benefitted from the resources and opportunities of a major research university system. The campus is part of a land grant institution whose mission is to advance the economic, social, and intellectual welfare of the region through research and outreach (Enrollment Management Group, personal communication, December 8, 2011). The EMG, made up of administration, faculty, and staff, determined that while the campus has a long history of retention programming, no standardized method of evaluation or follow-through in support of program improvement exists (Enrollment Management Group, personal communication, December 8, 2011). The lack of a rigorous quantitative analysis of the FIG program leaves stakeholders without empirically derived support for the further development of the FIG program. This study used data on program

participants, stored in a local cohort database, to evaluate the campus-wide retention efforts already in place.

Campus faculty and staff have access to decades of demographic and educational data on students, including survey responses, enrollment and course management data, advising notes, and academic records; data that may be used to evaluate program effectiveness as it pertains to student retention and persistence. However, the college administrators have not used this information in a formal, statistical evaluation of specific programs that are intended to affect retention and success. Currently, the FIG is offered only to a select population of first-time, full-time students, and has not been evaluated in terms of its impact on participants beyond their first year of college. A study that provides empirical evidence of program effectiveness may help the campus community recognize and celebrate—or review and design—a program that plays a critical role in promoting retention and persistence of all students through graduation.

Education in general, and retention programs specifically, are often automatically viewed as having embedded value (Brown, 1979), but in higher education, few programs can be presented as such without research-based evidence (Loots, 2008; Venter, 2008). The issue of promoting student retention and success is of utmost importance to institutions striving to effect social change through the development of responsible, productive, and prepared students.

Rationale

Evidence of the Problem at the Local Level

The rationale for choosing the local problem—the absence of empirical evaluation data on the impact of a freshman retention program (FIG) on student retention—grew out

of the practical need to understand local program effectiveness and the lack of local program evaluation practice. The rationale can be traced to four issues. First, is the campus retention committee's recommendation for the formal assessment of key initiatives (Enrollment Management Group, personal communication, December 8, 2011), due to the varying degrees of assessment and follow-through. Second, the responsibility for coordinating campus retention program assessments has been assigned to the retention coordinator (the researcher) for this institution (M. Madigan, personal communication, April 11, 2012). Because of the volume of available data and the large number of FIG participants, the director recommended the FIG as the first program to evaluate. Third, the campus retention committee report (Enrollment Management Group, personal communication, December 8, 2011) claimed that the FIG program was an example of a student retention initiative that could serve as a model for the larger student population, but this is a mere assumption. In order to support this claim, the impact of campus retention initiatives must be formally assessed in a timely manner; an assessment of impact must demonstrate the extent of the program's effect on the anticipated outcome (Chatterji, 2008). Fourth, it is anticipated that the model designed for this project will serve as a template for evaluating other campus programs. The creation of a local evaluation template will allow the retention coordinator to gather empirical data on other retention programs and present comparable evaluation data on all programs to campus stakeholders as directed.

Evidence of the Problem from the Professional Literature

The rationale for choosing the local problem (absence of empirical evaluation data) is supported in the professional literature, primarily by the need to establish

knowledge claims that will clarify and/or justify the use of resources for retention programming. While first-year seminars and FIGs are common, research on the varying types of programs has not shown a consistent impact on student retention (Strayhorn, 2009). Without evaluation data, the value of a particular program cannot be assessed, especially in the realm of higher education where institutions are increasingly expected to develop, implement and share researched-based strategies that effect social change (Brennan, 2008; Välimaa & Hoffman, 2008). Evaluation data on program impact at the local level is needed in order to substantiate claims about the value of that program to its participants and to the institution (Loots, 2008).

Students' retention and persistence to graduation were analyzed to demonstrate whether the FIG served as an effective enrollment tool. Further analysis along other demographic factors, such as ethnicity, living environment, academic performance, and financial need, was designed to inform the campus community about predictors of retention and how to best use resources and programs to reach the students most at risk of dropping out (Reason, 2009).

Purpose Statement

This quantitative analysis of the FIG program will address a specific gap in local practice: no formal assessments of retention programs have been conducted to determine what does and does not work in local student retention (Enrollment Management Group, personal communication, December 8, 2011). The purpose of this project study evaluation was to provide a clear understanding of the degree to which FIG participation impacts retention, and to identify the type of students who it would benefit most.

Definitions

Definitions specific to this project study were extracted from the literature on retention or from descriptive language used in enrollment and/or institutional research policy documents at the university.

*Cohort***:** A cohort is a group of people who share common experiences over a certain period of time (Population Reference Bureau, 2013). For the purposes of this study, a cohort is a group of students who enrolled during the same fall semester as first-time, full-time freshmen.

Data Warehouse: The data warehouse, a collection of institutional information available to approved faculty and staff within the university system, provides "snapshots" of fixed data for reporting and analysis (Data Warehouse, 2013).

Evaluation: For the purpose of this study, the evaluation research provides feedback that may enhance future FIG programming, and is defined by Rossi and Freeman (1985) as follows:

> Evaluation research is the systematic application of social research procedures in assessing the conceptualization and design, implementation, and utility of social intervention programs…. In other words, evaluation research involves the use of social research methodologies to judge and to improve planning, monitoring, effectiveness, and efficiency of health, education, welfare, and other human service programs.
>
> (p. 19)

The evaluation that will result from the proposed analysis is further defined by Spaulding's (2008) definition of an outcomes based evaluation as one that can verify or increase the impact of products or services on customers or clients.

Evaluation Index: An Evaluation Index (EI) is calculated for each first-year applicant using a unique formula derived by the university system to which the campus belongs. The EI calculation is a function of the student's high school GPA, class rank, and standardized test scores. To qualify for admission, a student's EI score must be at or above a set minimum on a 4.0 scale, depending on the intended area of enrollment (First-Year Admission, 2013).

Persistence to Graduation: The graduation rate at the local campus increases from an estimated 46.9% in four years to an estimated 65.6% in 5 years (A. Watters, personal communication, November 7, 2013). Therefore, for the purpose of this study, the performance measure of persistence to graduation will be defined by graduation from the university with 5 years.

Retention: The measurement of retention employed by the local campus and its university system is defined by the U.S. Department of Education's Integrated Postsecondary Education Data System (2013) as the percentage of full-time, first-time bachelor's (or equivalent) degree-seeking undergraduate students who entered in a fall semester (or the preceding summer term) who remain enrolled by the census date of the following fall semester. The definition employed by this project study will include <u>all</u> students, regardless of the date of their confirmed enrollment date, as the local system allows for confirmation beyond the census date. Retention is not to be confused with the

term *persistence*, which refers to the percentage of students who reach the end goal of graduation from their educational institution (Huntley & Donovan, 2010).

Significance of the Problem

The absence of evaluation data that informs professional practices in student services and academic affairs at the campus is a significant educational problem because educational institutions are increasingly charged with implementing retention programs that have been proven effective through rigorous research. While the selection and implementation of educational programs should be influenced by reliable evidence, it is more often influenced by the effective promotion, presentation, and popularity of a particular intervention (Slavin, 2008). Although many popular and well-researched retention theories exist (e.g., Bean, 1980, 2005; Braxton & Brier, 1989; Braxton & Hirschy, 2005; Cabrera, Castañeda, Nora, & Hengstler, 1992; Nora, 2001; Tierney, 2000; Tinto, 1993, 2006), the availability of these programs has done little to yield significant gains in retention and success nationwide (Horn & Berger, 2004).

In order to inform local policy development, practice, and promotion, stakeholders need an empirical understanding of the impact of their own local efforts. According to the campus retention committee, the FIG plays a crucial role in the 81% freshman retention rate, but there is no empirical evidence that demonstrates that this is true, or the extent to which FIG participants demonstrate greater retention rates (Enrollment Management Group, personal communication, December 8, 2011). Controlling for factors proven to affect retention, this project evaluation applied a retention theory to local practice in order to explain the strengths and/or weaknesses of the FIG program to inform future student retention practices. The quantitative data

collected and analyzed aims to provide the campus with evidence needed to justify and/or modify the current enrollment process, the allocation of time, and the resources dedicated to FIGs.

Research Questions

The absence of FIG program evaluation data leaves the campus without empirical evidence of program effectiveness, data that could answer the following research questions:

1. Does the likelihood of retention increase based on FIG participation?
2. Does the likelihood of persistence to graduation increase based on FIG participation?
3. What is the likelihood of retention when controlling for Bean's nine themes of college student retention?

Regression analyses answered the research questions above by testing their respective null (*HO)* and alternative (*HA)* hypotheses:

*HO*1: FIG participation does not increase the likelihood of retention.

*HA*1: FIG participation does increase the likelihood of retention.

*HO*2: FIG participation does not increase the likelihood of persistence to graduation.

*HA*2: FIG participation does increase the likelihood of persistence to graduation.

*HO*3: The likelihood of retention is not changed by controlling for Bean's nine themes of college student retention.

*HA*3: Controlling for the nine themes does increase the likelihood of retention.

While there does not appear to be a magical solution or program for retaining students, there are some commonalities across the research on retention literature and certain areas are often emphasized: (a) identifying special populations of students; (b) providing support for those students; (c) engaging in frequent and targeted statistical surveying of students; (d) offering quality advising and counseling; and (e) conducting regular program assessments. Because there has been no recent formal assessment and the FIG program serves a large number of students each year, an evaluation of its impact is a logical first step in determining its value as a retention program.

Retention efforts are being made by many units of the local campus community, but with occasional lack of coordination or communication between departments. Implementation and planning of retention initiatives is an individual institutional concern that is closely tied to strategic plans and the mission of the institution. Collection and analysis of retention data need to be comprehensive and on-going, including the identification and tracking of data likely to influence retention, as well as the formal and timely assessment of key retention initiatives. Throughout the campus community, stakeholders are expected to know who they serve and how they serve them, to commit themselves to enhancing the existing culture, and to do better at what they do best.

Review of the Literature On the Problem

This literature review justifies the selection of Bean's (2005) nine themes as the theoretical framework for this project study which served as a guide for collecting, organizing, and analyzing quantitative data. The review also (a) documents research on retention as a broad educational problem that warrants exploration, (b) explores various retention models, and (c) highlights the importance of conducting program evaluations.

Efforts to find relevant literature employed multiple database aggregators, including Academic Search Premier, the Directory of Open Access Journals (DOAJ), EBSCO, Google Scholar, JSTOR, Project Muse, ProQuest Research Library Core, PsychInfo, and Scopus. Search terms included: college students, college freshmen, learning communities, freshman interest groups, retention, persistence, completion, and evaluation. Boolean operators were used to both narrow and broaden the search results. While this strategy yielded over 250 journal articles, once scanned there was very little available that applied directly to the issue of a lack of evaluation data. A specific series of sources verifying the lack of evaluation data is not available, as this information had to be recalled over a long period of time, but the search for such information went beyond the available published literature. Examining the campus's written record and inquiring with institutional research committee also proved unsuccessful in the search for evaluation data. Also, much of the applicable college retention program literature is not from within the past 5 years. Therefore, section 3 includes a review of recent literature on the program evaluation genre, on project development, and on the connections to the study results.

Selection and Use of the Theoretical Framework

There are many frameworks through which a retention program evaluation could be conducted, but the program evaluated in this research project study was evaluated using Bean's *Nine Themes of College Student Retention* (2005). This is a familiar theory among higher education retention researchers; a Google search of the title revealed thousands of results and 286 citations—139 since 2012. Although Tinto's theory of student departure (1975, 1993) is arguably the most used retention theory in higher

education, many scholars argue that it focused too much on social and intellectual integration and neglected the impact of the outside world (Braxton et al., 2013; Stage, 1989; see also Braxton & Brier, 1989; Brower, 1992; Cabrera, Nora, & Castañeda, 1992). Bean's (1980) model of student attrition asserted that withdrawal from college was similar to leaving one's employment, as explained by McQueen in 2009:

> Bean, on the other hand, turns to a model of employee turnover that likens student withdrawal to resigning from a job, where background variables (e.g. past achievement, socio-economic status) combine with organizational determinants (e.g. perceptions of relationships, relevance of one's course and integration), in turn leading to the intervening variables of satisfaction and institutional commitment. The outcome of the sum of the variables is staying or leaving. (p.74)

This project study sought to identify the background variables that could lead to satisfaction and commitment and have an impact a college student's decision to stay or to leave.

Bean and Eaton (2001) argued that Tinto's model provides no instructions or explanations on how to develop the academic and social integration that promotes retention within an institution and claimed that the creation of specific programs may do just that. The characteristics of such programs, however, were left undefined (Melguizo, 2011). In 2005, Bean and Eaton clarified these characteristics:

> The flow of the model over time is as follows: pre-matriculation behavior and attitudes > student interaction with the institution and external environment after enrollment > attitudes about school experiences > intention to leave > departure from college. These themes are presented opposite the temporal flow and in a

> sequence consistent with the presumed importance of a factor on retention. Themes will be presented in the following order: intentions, institutional fit and commitment, psychological processes and key attitudes, academics, social factors, bureaucratic factors, the external environment, the student's background, and money and finance. (p. 218)

Bean warned that acting on these nine themes would not guarantee success, but would provide an understanding of variables that could be manipulated to improve retention. The themes, as defined by Bean (2005), that will serve as variables and guide this analysis are presented in Table 1 below. The data sets for each theme are explained in Section 2.

Table 1

Nine Themes of College Student Retention

Theme	Definition
Intentions	Plans to return for the fall semester of the sophomore year
Institutional fit & commitment	Attitude about being a student and attachment to the college
Psychological processes & key attitudes	Expectations of success
Academics	Performance in courses taken
Social Factors	Social connectedness and sources of social support
Bureaucratic factors	The role of campus offices; how information is formally exchanged

(table continues)

External environment	Factors beyond the control of the institution
Student's background	Strength of past performance and parental influence
Money & finance	Financial background

The institutional perspective inherent in this project study lends itself to the use of these specific data that would help local university administrators identify students who exhibit weaknesses in one or more retention themes that may be improved by participation in a FIG. Providing an understanding of that data along the nine themes was expected to identify the strengths of a local FIG program assumed to have a positive effect on student retention, and in order to inform the local educational community of unmet needs and/or gaps in services that may be addressed through the purposeful enrollment of students who need more targeted retention support.

Understanding the Issue of College Student Retention

Although college enrollment has consistently increased since 1993 (National Center for Education Statistics, 2012, 2016), keeping students enrolled continues to be an issue. In the 1970s and 1980s, stakeholders where concerned with increasing access to higher education. By the mid-1990s the concerns shifted to those of choice, cost, and completion. Solving these problems is a top priority for the Obama administration, as evidenced by President Obama's American Graduation Initiative (AGI), announced in July of 2009 (Obama, 2009).

Most of the research on retention suggests that enrollment status (full-time versus part-time) and academic readiness are important factors related to student persistence (e.g., Bean, 1980; Braxton & Brier, 1989; Braxton & Hirschy, 2005; Cabrera, Castañeda, Nora, & Hengstler, 1992; Nora, 2001; Tierney, 2000; Tinto, 1993, 2006). They also point out that these factors are more the result of socioeconomic conditions and student finances; they are realities that an institution cannot change. Much of current theory and practice in Retention and Enrollment Management stems from Tinto's institutional departure model and Pascarella's (1984) Tinto-inspired causal model. Other, later, models build from these foundations and usually operate within the parameters discussed by these authors. In the field of retention theory, researchers are beginning to see evaluation of a number of programs created using theories presented by Tinto, Pascarella, and to some extent Seidman's work with Special Populations. While there is no true standard model for colleges seeking to improve retention numbers, it is important to acknowledge Tinto's work especially looms large and is more likely than not an inspiration for many institutions' retention planning.

Tinto's model. According to Tinto's 1987 text, more students leave their college or university prior to degree completion than stay and that entry time-period (Fall, Spring or Summer) does not appear to be indicative of completion rate. He also differentiates between "Dropouts" and "Stopouts," reporting that 1% of academic dropouts return, while 5% of voluntary dropouts return for degree completion. For many students, "dropping out" (which each institution must define for itself) represents a choice and not a failure. Institutions should also view student departure this way to better identify the causes. Another trend noted by Tinto is that more rigorously selective institutions

statistically graduate more students than less selective institutions. He hypothesizes that retention is intrinsically tied to educational missions; that institutions interested in retention should ask this question, “For what educational problem is the institution the proposed solution?” This will help the institution define its retention standards and strategies. Comprehensive assessment of student departure must be in place for institutions to form a strategic action plan for retention. Strong social and academic integration and supportive communities are necessary, and special populations need to be identified and targeted.

Principles of Institutional Action:

1. Institutions should ensure that new students enter with or have the opportunity to acquire the skills needed for academic success;
2. Institutions should reach out to make personal contact with students beyond the formal domains of academic life;
3. Institutional retention actions should be systematic in character;
4. Institutions should start as early as possible to retain students;
5. The primary commitment of institutions should be to their students;
6. Education, not retention, should be the goal of institutional retention programs. (p. 138.)

Pascarella’s causal model. In Pascarella’s work the three most influential factors to student persistence are residential facilities, peer groups and informal out-of-class faculty involvement. He provides a model (see fig. 1.1) that can be adapted depending on the institution but with consistent base elements.

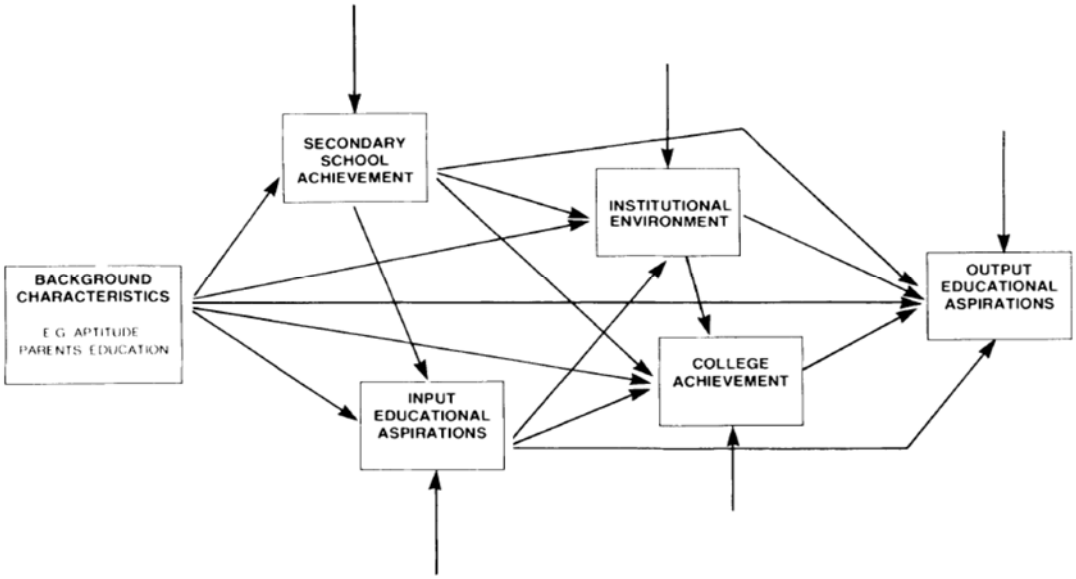

Fig. 1 General causal model to explain educational aspirations after two years of college. From "College Environmental Influences on Students' Educational Aspirations," by E. T. Pascarella, 1984, *Journal of Higher Education*, *55,* p. 755. Copyright 1984 by Ohio State University Press. Reprinted with permission.

Pascarella (1984) emphasizes the need to acquire background and high school achievement information on students that can indicate issues with persistence such as parent's education level and academic aptitude. As is illustrated in the base-line model (again, to be adapted based on institution type), while characteristics lead to forward motion, they are all related, forming a web of factors that lead to an individual student's expectations, persistence, and ultimately retention.

Peer mentoring and living-learning communities. Many retention initiatives are based on the social integration position put forth by Tinto and others, whereby students adapt to the institution through a network of social and academic touch points. However, according to Maldonado, Rhoads, and Buenavista (2005), what these models fail to acknowledge is collectivism, that students do not always act individually with

individual wants and needs and communities have a large influence over a student's persistence at particular institutions. From a 2006 study by Kahveci, Southerland and Gilmer, more data-driven support was given to "living-learning" communities as a potential retention tool. While the study looked at female retention within Science, Math, and Engineering (SM&E) majors, their conclusions are applicable to many student populations. The study showed that female students who participated in a female-only program that not only provided housing among academic peers, but "supportive environments, close student-faculty/scientist relationships, opportunities for research experiences, mentoring, and academic networking" (p. 37-38) were more likely than non-participants to remain in SM&E majors. In fact, the program was able to retain a larger percentage of students than the non-participant male group also surveyed. This indicates that programs that are "interactive, cooperative, experiential, and learner-focused" (p. 38) would be amenable to retaining a more diverse student population, regardless of gender.

Seidman's model. According to Seidman, retention takes the entire college community and identification of Special Populations is key. In Seidman's (2005) research, he cites several factors which may indicate a student is at risk of leaving an institution before graduation: delayed enrollment; part-time attendance; financially independent status; parent of dependent children; single parent; non-high school graduate (GED or equivalent); full-time while enrolled; and/or is an ESL student. Likewise, there are several indicators for successful retention. He suggests identifying Special Population students at multiple times and while a student may not be identified as such right away, they may become part of a Special Population after they matriculate. Some recommended ways of identifying students who may end up departing an institution prior to

matriculation are essays, standardized assessment, college assessment, academic goals, personal goals, parental education level, economic level and family structure. After enrollment, all populations should still be monitored for warning signs and beyond standard reporting, Faculty should have a mechanism for identifying Special Population students any time during the term. Feedback should be sought from faculty regarding the improvement after intervention. Finally, he recommends that institutions do not recruit students who will not be successful unless you provide programs to help them overcome deficiencies.

Student-centered learning communities. The Kellogg Commission on the Future of State and Land-Grant Universities, an organization of 25 current or former presidents of public and land grant institutions, published a 1997 report that issued a clarion call for the reform of higher education. Suggesting that the future of higher education is clouded by an unwillingness to let go of the past, the Commission called for a refocusing on transforming institutions into student-centered learning communities. The Commission contends that a student-centered approach calls for the entire campus community to change their approach to learning communities, and cites several examples of learning community efforts across the nation (Gee, 1997). While the development and implementation of learning communities is relative to the specific characteristics of the particular institution, Gabelnick, MacGregor, Matthews, and Smith (1990) described five models of learning communities differentiated by level of student and faculty collaboration and amount of coordination. The learning community models identified include the following:

Linked Courses – the simplest form of learning communities in which cohorts of

students co-enroll for two or more courses that are taught by different faculty.

Learning Clusters – linking of three or more courses in which students also enroll as a cohort. Learning clusters may exist for a term, semester or entire academic year, often comprising most or the students' entire schedule.

Freshman Interest Groups (FIG) – the FIG model links cohorts of students with two or more courses and includes a peer mentoring component. Targeted toward first-year students with similar interests in potential majors, FIGs also provide a peer support system for entering students and are generally employed at large institutions.

Federated Learning Communities (FLC) – developed in large research institutions, these learning communities include faculty development as a principle goal. The FLC model links students of various academic levels in an array of courses arranged around a particular theme. Students also enroll in a seminar designed to facilitate integration of the content of the three linked courses by a "master learner," a faculty member from an academic area different from the courses offered. The experience of the master learner helps the integration process for students of differing views and commonalities of the course materials.

Coordinated Studies Programs - students and faculty are fully immersed in an interdisciplinary course structure for an entire term, semester or year. Teams of three to five faculty members teach in only one coordinated studies program that generally consists of 16 credit hours (Gabelnick et al., 1990, p. 28).

Varying definitions of learning communities abound in the literature. Smith and Hunter (1988) defined learning communities as "a deliberate restructuring of the curriculum to build a community of learners among students and faculty" (p. 46).

Schroeder and Hurst (1996) summarized Astin's (1985) view of learning communities as groups of students with similar goals, and that participation in such a group helps the members: (a) establish their place within the larger campus community; (b) pursue participation in educational activities; (c) increase and improve the content of their casual interactions with faculty and fellow students; and (d) cultivate diversity in their educational experiences (Schroeder & Hurst, 1996). Prerequisite to learning community programs is the linking of courses around a common theme in order to better establish subject coherence for students (Gabelnick et al., 1990). This linking of coursework aids contextually in identifying relationships between courses, and helps students develop a community within the classroom that promotes the learning community goal of improved social and academic integration among students. A variety of learning communities have emerged across the country, including those at community colleges and predominately large institutions; FIGs have emerged as a frequently used option among a variety of institutions because of their simplicity and low cost (Gabelnick et al., 1990).

The University of Oregon was among the first institutions to implement the FIG model, which includes a peer-mentoring component and focuses on introducing students to possible or potential major fields of study (Oregon, 2001). Begun in 1982 with two cohorts of 25 undecided first-year students, the program now enrolls nearly 1,000 students in 47 distinct options, ten of which house students in the same residence hall. Students are enrolled in two or three thematically-linked courses during the fall term. Learning communities, FIGs included, are viewed as high-impact opportunities for students to engage which leads to greater levels of college success among program participants (Kuh, 2008; Pike, Kuh, & McCormick, 2011).

Despite the amount of research on the make-up, type, and setting of the learning communities and the subsequent student engagement that they promote, very little is known about the specific circumstances under which students will reap the greatest benefits from participation (Pike, 2000). Many studies report on the success of FIG/First-Year Experience programs (Erickson & Stone, 2012; Schroeder, Minor, & Tarkow, 1999; Sidle & McReynolds, 2009; Tinto, 1993), but colleges and universities seeking to reduce their attrition rate need to develop the practice of evaluating their programming in order to design and target their efforts at the student most in need and who will most benefit from the intervention (Braxton, 2008; Jamelske, 2009; Madgett & Bélanger, 2008; Strayhorn, 2009; Weng, Cheong, & Cheong, 2010).

Importance of Program Evaluation as a Research Design

This project addressed a specific gap in local practice: no formal assessments of retention programs had been completed to determine what works in local retention and what does not. Royse, Thyer, and Padgett (2010, 2015) defined program evaluations as an "aspect of professional training aimed at helping (stakeholders) to integrate research and practice skills, using the former to enhance the latter" (p. 1). They go on to say that its purpose is to specify information that will improve the program and that without conducting an assessment there can be no understanding of students' needs or services that are overlooked, and outline list of motivations (Table 2) for conducting program evaluations:

Table 2

Motivations for Program Evaluation

We want to show	We want to know
1. That clients are being helped.	Are clients being helped?
2. That clients are satisfied with our services.	Are clients satisfied with the services received?
3. That the program has an impact on some social problem.	Has the program made any real difference?
4. That a program has worth.	Does the program deserve the amount of money spent on it?
5. That one program or approach is better than another.	Is the new intervention better than the old?
6. That the program needs additional staff or resources.	How do we improve this program?
7. That the staff are well utilized.	Do staff make efficient use of their time?

From *Program Evaluation: An Introduction,* 5E, (p. 15), by D. Royse, B. A. Thayer and D. K. Padgett, 2010, Belmont, CA: Wadsworth Cengage Learning. Copyright 2010 by South-Western, a part of Cengage Learning, Inc. Adapted with permission.

The only evaluation of the campus FIG program was conducted over ten years ago, and the data collected measured students' integration and satisfaction; it did not measure student retention. This evaluation assessed the FIG program by looking for correlations between FIG participation and specific factors known to affect retention and persistence to graduation. Such correlations may provide an understanding of the students who would be best served through FIG participation, thereby informing the local education community that wants to both "know" and "show" that a major campus program meets student needs. Single and Waddell (2010) argued that institutions need to

developa retention model that will help identify which students are most at-risk and require particular interventions. To that end, this project used the data collected to conduct a program evaluation to provide a better understanding of which student factors create the greatest student barriers. The results of that understanding may provide direction for future FIG or other learning community program development models to ensure that students who will most benefit are targeted for participation.

Saturation

Based on the literature review, the selection of the *Nine Themes of College Student Retention* (Bean, 2005) was justified as the theoretical framework for this project study. The review also documents research on retention as a broad educational problem that warrants exploration, explores various retention models, and highlights the importance of conducting program evaluations. Efforts to find related literature included Boolean Searches and database aggregators, in addition to searching the entire catalog available through the campus which is part of the Big Ten Conference of library systems.

Implications for Possible Project Directions

The literature review above highlights the need for schools to understand students' needs and demonstrate their commitment to meeting those needs through programs that will support their success. Producing data is one step; it is the conversion of data into meaningful information that offers opportunities for institutional growth and development (Delaney, 2009). Potential project directions might include:

1. Evaluation Report – interpret the major student outcomes (findings) that emerged from the data analysis. An evaluation report may lay the groundwork for

creating a model to identify incoming freshmen who would benefit from first-year retention interventions;

2. Professional Development Materials - create training materials that incorporate the strengths and address the weaknesses of retention programming and resources provided on campus. Faculty and staff may not be fully aware of the issues that affect student retention in general, may not recognize the specific issues found to have an impact at the local level, and may not understand the degree to which the campus is able to remediate those issues;

3. Curriculum Plan - create a new curriculum for use with students identified as most at-risk of non-retention/non-persistence for use in various settings. Results of the analysis may clearly identify local retention issues that could be addressed in various settings, such as classroom instruction, academic advising interactions, and or involvement in student clubs and activities;

4. Policy Recommendation – present background on existing recruitment and enrollment strategies, their effect on retention, and new strategies supported by the data. Inform the campus community of the current student retention approach, and make recommendations for future strategies that include the involvement of all stakeholders.

These efforts towards enhanced understanding and promotion of student retention efforts would also support positive faculty-student interactions and provide opportunities for concentrated collaboration between academic and administrative units, both of which would help to demonstrate the cost benefit of offering FIGs or other learning communities on campus.

Summary and Transition

Retention is about identifying and addressing barriers to students' progress and implementing interventions to help them overcome those barriers (Garcia, 2010; Hernandez & Lopez, 2005). Identifying and understanding the factors that lead to student attrition or departure is only part of the student retention equation; FIG evaluation data will provide the campus with recommendations for what can be done to enhance the success of a program that plays a key role in the campus retention model. The research record on learning communities and FIGs indicated that students who participated in learning communities showed a variety of associated positive outcomes. Studies indicate that participants in learning communities (i.e. FIG) earn higher grades than nonparticipants, have lower attrition rates, and are more satisfied with their collegiate experience. There is a clear need for further study of learning communities beyond those at larger campuses whose assessments make up the overwhelming majority of the research record. Bean's theory will serve as a guide for collecting, organizing, and analyzing quantitative data that will explain local student retention issues, and identify the strengths of a local FIG program that is assumed to have a positive effect on local student retention.

Section 2 explains how each of the nine themes were measured, the sources and type of data available for collection and analysis, and the statistical tests to be used for each of the four research questions and corresponding hypotheses. In addition to presenting the research method, data collection, and analysis techniques, Section 2 also includes the research setting, potential sample, instrumentation, and a discussion of the limitations and ethical considerations.

Section 3 will discuss the project as an outcomes-based program evaluation that explores the FIG program's degree of benefit to overall campus retention, as well as the degree of benefit to students with particular characteristics. Section 3 includes details on the implications of the project for social change.

Section 4 includes scholarly reflections and the potential for additional research projects on this topic.

Section 2: Methodology

Research Design and Approach

This quantitative study analyzed the FIG program to determine its overall effect on student retention. Institution-specific data were analyzed using regression models to answer the following guiding questions:

1. Does the likelihood of retention increase based on FIG participation?
2. Does the likelihood of persistence to graduation increase based on FIG participation?
3. What is the likelihood of retention when controlling for Bean's nine themes of college student retention?

More specifically, the regression analysis answered the research questions above by testing their respective null (*HO)* and alternative (*HA)* hypotheses:

HO1: FIG participation does not increase the likelihood of retention.

HA1: FIG participation does increase the likelihood of retention.

HO2: FIG participation does not increase the likelihood of persistence to graduation.

HA2: FIG participation does increase the likelihood of persistence to graduation.

HO3: The likelihood of retention is not changed by controlling for John Bean's nine themes of college student retention.

HA3: Controlling for the nine themes does increase the likelihood of retention.

Data were collected using a purposeful along Bean's (2005) nine themes in order determine which student characteristics might predict the risk of not being retained, and

therefore the need for enrollment in a program that positively affects retention and persistence to graduation.

The results of this analysis were used to inform the project of the study, an evaluation of the local FIG program, in order to make decisions about the future implementation of the FIG as a retention program. The procedures in quantitative and qualitative methods are similar: (a) define a problem; (b) focus on a research purpose; (c) form key questions to be answered; (d) select a study population; and (e) collect and evaluate data (Glesne, 2001, p.5). However, the way conclusions are reached is vastly different, as qualitative researchers use inductive reasoning to draw out conclusions, while quantitative researchers propose hypotheses to be tested (Lodico, Spaulding, & Voegtle, 2006).

In this study, the quantitative analysis used a logistic regression model, which allowed for the inclusion of themes with underlying variables analyzed against a binary response variable (retained or not, persisted or not). The goal of predicting a categorical outcome variable prompted the use of logistic regression, which allowed for analyzing the influence of multiple independent variables (predictors) on a dichotomous dependent variable. Logistic regression was appropriate in this case as opposed to linear regression; The dependent variable in linear regression must be continuous, and for this study, the dependent variable was categorical and thus excluded the use of linear regression as the statistical analysis. (Lodico et al., 2006).

While qualitative program evaluations may inform improvements in program content, Oriel (2011) argues that the qualitative approach does not provide an assessment of the effect that a program has on a particular objective. In this case that objective is

retention and the subsequent persistence to graduation. A quantitative evaluation provided a clear understanding of students who are retained versus not retained and the degree to which FIG participation impacted that retention. This analysis identified the type of students who would benefit most from participation, which may help guide future FIG enrollments and further strengthen campus retention. Qualitative inductions might answer questions pertaining to the causes of or approaches to addressing students' issues, but that is not the intent of this research. In view of these reasons, and the local problem of a lack of FIG program evaluation data, a quantitative program evaluation was conducted.

The purpose of this evaluation was not to inform the local campus community regarding the success or failure of the local FIG program. Rather, the purpose was to provide feedback that may enhance future FIG programming on campus, furthering its impact on the retention of students most at risk of dropping out. Spaulding (2008) defines an outcomes based evaluation as one that can verify or increase the impact of products or services on customers or clients. The verification of a desired outcome prevents providers from relying on their own instincts or beliefs about whether or not a product or service meets a need. An outcomes based evaluation addressed the local problem of a lack of evaluation data, and provided the local campus community with substantiation of the FIG program's impact on retention.

Type of Evaluation

The outcomes for this evaluation were the retention and persistence to graduation rates. The performance measure for FIG versus non-FIG retention was the percentage of those students who should have returned for their second year of study. This excluded

students who must move to a different location within the system after their first year, as defined by their intended major. Students who remain enrolled at the local campus as of the six-week census date of their 3rd semester are considered retained. The performance measure for persistence was the percentage of the retained students who graduated from the university within five years. The nature of this study does not fit neatly into a particular evaluation type (e.g., goal-based, outcomes-based, formative, or summative). The use of logistic regression analysis and the interpretation of inferential statistics are deemed appropriate when analyzing whether or not relationships exist between or among variables (Triola, 2002). Such an approach is commonly used when the manipulation of those variables is difficult or impossible (Kamil, Langer, & Shanahan, 1985; Vogt, 2007).

The regression analyses controlled for certain student characteristics in the data that is available, which may account for some of the variation in the outcomes. There are other characteristics that were available (e.g., the use of support services or hours spent working) and were not measured in this study that might also have impacted the outcomes and therefore become part of the error term (*ei*) in Equation 1. These analyses met the overall evaluation goal of verifying the FIG program's effectiveness in order to define the degree of benefit to overall campus retention, as well as the degree of benefit to students with particular characteristics.

Setting and Sample

The setting for this quantitative project evaluation was an individual campus within a large, multicampus, state-wide university system. The Director of Enrollment Management reported that the incoming freshmen class averages 1,100 students per year (M. Madigan, personal communication, October 1, 2014).

Population and Sampling Method

The population was drawn from recent freshmen cohorts for which school records contain all of the variables necessary for a study utilizing Bean's (2005) nine themes. Due to the absence of data for the earliest years of the local FIG program, this study employed an availability or convenience sampling method. Convenience sampling, a form of nonprobability sampling, is often used in settings in which researchers merely have access to the population needed for a study (Pettus-Davis, Grady, Cuddeback, & Scheyett, 2011, p. 384), and is warranted when the results of a study are intended to inform policy at a specific institution (Lodico et al., 2006, p. 142). Since data may be obtained from the university's data warehouse system by those with approved access, the convenience sampling method was appropriate for this study.

Sample Size

While Creswell (2008) and Lodico et al. (2006) indicated that $N = 30$ is considered an acceptable minimum number for experimental quantitative research, larger samples are considered more accurate and representative of any research claims. Green (1991) further defines the sample requirement for logistic regression analysis as 30 subjects per predictor, per group, and each subject record must contain all data measurements. Therefore, a minimum of 660 complete records (330 for each study group) were required. This study examined a starting population of thousands of students, which translated to a sufficient sample size necessary to verify effect beyond a $p < .05$ level. All students, based on the available population and eligibility criteria, were included.

Eligibility Criteria

Eligible students for the retention outcome are those who started at the local campus and had no academic requirement to transfer to another campus location for their 3rd semester; this left a pool of students who should be returning for year two. The persistence to graduation outcome was limited to students who could have completed their degree at the local campus; eligible students will include those who declared a locally offered program as their first choice major, indicating their intention to return to the local campus for year three.

Characteristics of the Selected Sample

Evaluating a 5-year cohort gave a better sense of completers; the graduation rate at the local campus increases from an estimated 46.9% in 4 years to an estimated 65.6% in five years (A. Watters, personal communication, November 7, 2013). Therefore, student characteristics for this study included first-time, full-time, bachelor's degree-seeking students who should have graduated in ten semesters by May of 2015. While the entire FIG population includes cohorts dating back to the fall of 2004, the most recent eligible cohort of students were enrolled in the fall of 2006. This was the first cohort for whom available records contain all of the necessary variables to conduct this study. The financial need data for freshmen who enrolled in a FIG prior to this date were not available. Of this sample, students may or may not have opted to enroll in a FIG. FIG's at the campus were optional, and offered on a first-come, first-served basis until each section was full. Freshmen who wished to live in the suite-style residence hall had to opt for a FIG, but those living in other halls as well as commuter students were also able to participate.

Instrumentation and Materials

The goal of this project study was to assess the FIG program's impact on the dependent (response) variables of retention and persistence, as well as along nine different themes, or independent variables (predictors). Out of the 11 measurements considered in this study, seven are categorical, three are ratio, and one is ordinal (see Table 1). The binary dependent or response variables of retention and persistence to graduation are categorical and were coded in the regression analysis as *retained* = 1 and *not retained* = 0, and *persistence* =1 and *nonpersistence* = 0.

Conducting a program evaluation from the perspective of a particular institution warranted the use of institution-specific data, as was planned for the evaluation of the local FIG program. The Educational Planning Survey (EPS), unique to the state-wide university system, is required of all students, and responses are collected in the spring prior to academic orientation and enrollment at any campus within the university system. These responses and all other hard data (enrollment/scheduling dates, GPAs, demographics, etc.) are stored in the campus cohort database, which is pulled from institution's data warehouse.

Student records include data collected from the time each student applied for admission through their graduation from the university, and contain all of the necessary information for each student in the study sample. All records are housed in various tables, providing snapshots of time-fixed data, and were accessed, by the researcher, for the purposes of this study upon Walden IRB approval (#07-20-15-0067017). Approval by the campus data steward (see Appendix A) and the university's Office for Research Protections (see Appendix B) was also required.

Variables – Bean's Nine Themes of College Student Retention

Bean's (2005) nine themes are summarized below, and each definition is followed by the description of the institution-specific variables that will be used to measure that theme.

Intentions. The student plans to return for the fall semester of the sophomore year. Students who complete their second semester at the local campus are expected to return for the following fall, provided there was no academic requirement to transfer to another campus location for their third semester. Second to third semester students who have confirmed their registration by the census date are considered retained and reported as such to the federal government.

Institutional fit and commitment. The student's campus choice at the time of application indicated the student's preference for the local campus or another campus within the university system.

Psychological processes and key attitudes. The student's expectations of success were measured by the grades they predict for themselves for the first year.

Academics. The student's performance on courses taken, measured by the first-year cumulative GPA.

Social factors. Social connectedness and sources of social support were measured by the student's residency status (on campus by residence hall or off campus).

Bureaucratic factors. The role of campus offices and how information is formally exchanged were measured by the academic home of the student's intended major, providing an understanding of retention within each academic area.

External environment. Issues out of the control of the institution. The study will use the student's ethnic background as the primary indicator of their external environment.

Student's background. The strength of student's past performance and the parental influence. This study used past academic performance as the primary indicator of the student's background, which was measured by the evaluation index (EI). The EI is a function of the student's high school GPA, class rank, and standardized test scores. To qualify for admission, a student's EI must be above at or above a certain level on a 4.0 scale, depending on the intended area of enrollment.

Money and finance. The student's financial background was measured by the financial need index, which is determined by the financial need index determined by the institution.

Interaction terms. Interaction terms specify a combined effect that two or more variables have on the outcome variable. Homer and Lemeshow (1989) recommended that researcher choose terms based interpretability, logic, and support in the literature. Bean (2005) identified four interactions which he later clarified into the nine separate themes above:

1. Pre-matriculation behavior and attitudes – money and finance, student's background, external environment;

2. Interaction with institution and external environment after enrollment - bureaucratic and social factors;

3. Attitudes about school experiences – academic performance and psychological processes/key attitudes;

4. Intention to Leave – institutional fit/commitment and intentions.

The interaction terms listed above were entered utilizing the institution-specific variables used to measure that theme. Summary data will be presented in various tables under the results section below. The vast volume of raw data will be stored electronically and be made available by request.

Data Collection and Analysis

An exploratory data analysis (EDA) step used descriptive statistics to verify that the assumptions about the data are tenable. The regression model that followed the EDA yielded valuable inferential statistical data, such as odds ratios for significant variables and the probability that a given variable or group of variables predict student retention at a statistically significant level. Inferential data of this kind could be used to consider focused FIG enrollment efforts, such as targeting students with particular retention risk factors for participation in the FIG program.

Logistic regression approximates the odds of an event occurring that involves a categorical dependent variable, e.g., retained or not, or persisted or not in school (Menard, 2011). Logistic regression will be effective in this analysis as it will enable the odds ratio for each of Bean's (2005) nine themes (independent variables), retention, and persistence to graduation. It predicted the probability of retention for each student in the sample based on the nine themes. The specific logistic regression equation for this study is:

$$\log it[\mathrm{Pr}ob(Y_i = 1)] = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 \ldots \beta_{11} X_{11} + e_i \quad (1)$$

where β_0 is constant, and $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8, \beta_9, \beta_{10}$, and β_{11} are considered the regression coefficients of the independent variables. Two sample groups – FIG and no

FIG – analyzed using the Equation 1 above considered the following null hypotheses for this study:

HO1: FIG participation does not increase the likelihood of retention.

HO2: FIG participation does not increase the likelihood of persistence to graduation.

HO3: The likelihood of retention is not changed by controlling for John Bean's nine themes of college student retention?

More specifically, the regression analysis was the statistical method used to answer following questions:

1. Does the likelihood of retention increase based on FIG participation?

HA1: FIG participation does increase the likelihood of retention.

This was tested by analyzing the statistical results of the β_1 coefficient.

2. Does the likelihood of persistence to graduation increase based on FIG participation?

HA2: FIG participation does increase the likelihood of persistence to graduation.

This was tested by analyzing the statistical results of the β_2 coefficient.

3. What is the likelihood of retention when controlling for Bean's nine themes of college student retention?

HA3: Controlling for the nine themes does increase the likelihood of retention.

This was tested by analyzing the statistical results of the $\beta_3 - \beta_{11}$ coefficients.

Raw data were collected through a series of Microsoft Access queries within various data warehouse tables, and imported into SPSS software for non-experimental analysis. Non-experimental research is appropriate when the method includes analysis of

records with no direct human interventions (Creswell, 2009). Data for the variables related to each of Bean's (2005) nine themes were collected and analyzed against the binary dependent (response) variables of retention and persistence (or not) using logistic regression analysis. The inclusion of themes with underlying variables and one binary response variable prompted the use of logistic regression, which allowed for analyzing the influence of multiple independent variables (predictors) on a dichotomous dependent variable (Lodico et al., 2006). The outcomes of the regression analysis were interpreted as findings in the final evaluation report. The data sets used, and the data storage location and data collection method are presented in Table 3.

Table 3

Measurement of the Predictors

Variable Name	Database/Table	Type	Description
β_1 – *Retention*			
Confirmed Registration for 3rd Semester	student/official	Categorical	Confirmed Registration (1 = *retained* 0 = *not retained*)
β_2 – *Persistence to Graduation*			
Graduated within 5 years	student/official	Categorical	Bachelor's Degree Approved (1 = *persistence* 0 = *nonpersistence*)
β_3 – *Intentions*			
Completed 2nd Semester	student/official	Categorical	Expected for 3rd Semester (1 = *yes*, 0 = *no*)
β_4 - *Institutional Fit and Commitment*			
First Choice Campus	ugaapplic/applicants	Categorical	Local campus = 1st choice (1 = *yes*, 0 = *no*)

(table continues)

Variable Name	Database/Table	Type	Description
β_{5}- *Psychological Processes and Key Attitudes*			
Expected Grades	dus/eps	Categorical	Student's estimated average after one year *(A, A-, B+, B, B-, C+, C)*
β_{6}- *Academics*			
Year 1 GPA	student/semester	Ratio	First year GPA (0-4.0)
β_{7} - *Social Factors*			
Housing Status	student/housing	Categorical	First-year housing location *Residence Hall A* *Residence Hall S* *Residence Hall L* *Residence Hall N* *Residence Hall P* *Other Campus Housing* *Off-Campus*
β_{8} - *Bureaucratic Factors*			
Academic Home	student/semester	Categorical	Premajor Area *BUS, ENG, HSS, SCN, DUS*

(table continues)

Variable Name	Database/Table	Type	Description
β_9 - *External Environment*			
Student Indicator	student/bio	Categorical	Student's Ethnicity
β_{10} - *Student's Background*			
Enrollment Index	ugaapplic/applicants	Ratio	Institution's prediction of student's first year GPA *0-4.0, non-science PGPA*
β_{11} - *Money and Finance*			
Need Index	Institutional Research Committee	Ratio	Level of financial need *0-100*

Assumptions

This study grounded by two key assumptions: (1) the demographic and Educational Planning Survey responses collected from students' academic records were assumed to be correct but could not be verified, and (2) the model assumed that the data were valid representations of each independent variable (Csikszentmihalyi & Larson, 2014; Swan, 2013). The use of secondary institutional data allowed for a large sample to be collected quickly, eliminated the possibility for multiple responses by the same subject, and provided uniform responses for each study variable. Recommendations based on the study findings will also be grounded by the same assumptions: that students answered honestly and that the data collected for each variable was appropriate.

Limitations

Gilmore (2006) defined limitations as "events or factors over which the investigator has no control" (p.186). Factors that may impact the parameters of this study are:

1. Data represents first-time, full-time, bachelor's degree seeking students who started at the local campus and had no academic requirement to transfer to another campus location for their 3rd semester. Findings are limited to this population only;
2. Due to varying definitions and curricular differences it is difficult to make generalizations about the similarities among FIG programs at different institutions. Findings are limited to the local campus only;

3. While the entire FIG population includes cohorts dating back to the fall of 2004, the first cohort for whose available records include all of the variables necessary to conduct this study were enrolled in the fall of 2006. Students enrolled after the fall of 2010 had not reached their 5-year graduation limit when this study was proposed and approved. Therefore, this study was limited to four student cohorts: fall 2006, 2007, 2008, and 2009;
4. The evaluation did not include qualitative inductions, limiting the perspective of the final report.

Delimitations

Delimitations of a study provide boundaries and help to define the parameters of a research effort (Gerkin, 2009). There are several delimitations that restricted the scope of this study:

1. Only data on students from one local campus were used;
2. The study focused on student characteristics upon entering the institution, and, if retained or persisted, upon those achievements in their academic timeline;
3. The study did not reflect changes made en route to graduation (e.g., changing majors, a high or low semester GPS that could have affected plans or state of mind, etc.)

Ethical Considerations

Lodico et al. (2006) stressed three issues to consider while conducting ethical research: “obtaining informed consent from participants, protecting them from harm, and

ensuring confidentiality" (p. 1470). Due to the nonexperimental nature and use of stored secondary data, this project posed no risk of harm or injury to participants. The proper authorizations to collect and analyze data were requested through the Walden IRB process. That request, approved on July 20, 2015 (IRB approval #07-20-15-0067017) provided detailed information on the steps planned to ensure confidentiality and the protection of raw data, including:

1. Upon collection of all data sets from the Data Warehouse, all identifying information was removed. Each subject was assigned a unique number that cannot be matched back to the subject in the Data Warehouse or in any other reports.
2. All unidentifiable raw data is stored in a password protected data storage device.

Logistic Regression Procedure

When the dependent variable is dichotomous (i.e., retained vs not retained or persist versus did not persist), logistic regression is particularly appropriate, as opposed to multiple regression or other types of discriminant analysis (Hosmer & Lemeshow, 1989; SPSS, 2004). Logistic regression is an effective means of determining which independent variables and combinations of variables are sufficient to accurately describe retention. Logistic regression analysis also predicts the probability of retention when controlling for the required variables.

Through indicator coding, the SPSS (2004) logistic regression procedure automatically created new variables for categorical variables. With indicator coding, the

coefficients for the variables in the model represent the effect of each category compared to the reference category: the subgroups within that variable least like to be retained and/or persist graduation. The reference categories were determined by examining the descriptive statistics.

The regression analysis for each research question used stepwise entry, a convenient and effective method of examining unknown outcomes (Draper & Smith, 1981), as well as the more rigorous likelihood-ratio (LR) test as the criterion for determining variables to be removed from the model (Hauck & Donner. 1977; Jennings, 1986). Following guidelines described by Hosmer and Lemeshow (1989), procedure for inclusion of significant variables and interactions in the final model was as follows: (1) Stepwise selection of main effects; (2) forced entry of the main effects significant on step (1), followed by stepwise selection of interaction terms given the main effects variables in the model; and (3) assessment of the final model through examination of goodness-of-fit statistics.

This study addressed the following key assumptions associated with logistic regression analysis, as the quantitative method requires that certain criterion be met before the results can be interpreted (Field, 2013). The criteria are: (a) the dependent variables are binary, or dichotomous in nature (e.g., retained vs not-retained, and persisted vs did not persist); (b) Pr*ob*($Yi = 1$) is the probability of the desired event occurring, and the dependent variables are coded accordingly: *retained* = 1 *and not retained* = 0, and *nonpersistence* = 0 and *persistence* = 1; (c) the model is correctly fitted with only meaningful variables, and all meaningful variables are included utilizing the

appropriate entry order. This study will use the stepwise method of including variables, in which variables are selected in an order that maximizes the contribution to the model. Variables will be entered in the order outlined by the *Nine Themes of College Student Retention* (Bean, 2005). Calculation of the Pearson residuals produced a horizontal band within +/- 3, as expected when the fitted logistic regression model is true (Agrest & Kateri, 2011); (d) each observation is independent, error terms are independent, and there should be no inter-correlations between the independent variables. That is, the independent variables are independent from each other, preventing multicollinearity in the model. Data used in this study did not include any pre-post sample measurements or matched pairs. Each data set provided a fixed measurement, a snapshot of fixed data, for that moment on each student's academic timeline; (e) a large sample, at least 30 subjects per independent variable, will be available. This study examined a population of 4,098 students; satisfying the minimum number of 660 complete records (330 per group); and (f) the model assumed that the data are valid representations of each independent variable.

Results

The 4,098 students in the study sample included 1,346 students who participated in the FIG, and 2,752 students who did not. Retention and persistence outcomes are presented in Table 4, and are disaggregated by FIG participation, gender, ethnicity, premajor, and housing status. There was little difference between the retention of FIG participants versus non-FIG participants (84.8% vs 80.4%),

retention between genders (males = 81.9% vs females = 81.8%), and persistence between genders (males = 66.7% vs females = 68.1%).

Table 4

Retention and Persistence Outcomes

N	% retained	% not retained	COMPARISON VARIABLE	% persist	% non persist
			PARTICIPATION		
1346	84.8	15.2	FIG	75.0	25.0
2752	80.4	19.6	No FIG	63.4	36.6
			GENDER		
2561	81.9	18.1	Male	66.7	33.3
1537	81.8	18.2	Female	68.1	31.9
			ETHNICITY		
5	60.0	40.0	Native American	60.0	40.0
87	74.7	25.3	Hispanic	52.3	47.7
110	87.3	12.7	Asian	63.3	36.7
1	100.0	0.0	Hawaiian	0.0	100.0
3529	81.9	18.1	White	68.8	31.2
67	97.0	3.0	Foreign	76.1	23.9
135	89.6	10.4	No Response	64.4	35.6
164	68.9	31.1	Black	42.0	58.0
			PREMAJOR		
711	86.2	13.8	Business	73.6	26.4
1184	85.9	14.1	Engineering	71.5	28.5
651	77.9	22.1	H&SS	64.7	35.3
544	96.3	3.7	Science	67.8	32.2
1008	78.7	21.3	DUS	58.9	41.1

(table continues)

N	% retained	% not retained	COMPARISON VARIABLE	% persist	% non persist
			HOUSING		
221	94.6	5.4	Freshman Honors	89.1	10.9
557	88.2	11.8	Freshman Suites	79.3	20.7
727	82.0	18.0	Freshman Dorm (L)	68.2	31.8
789	82.3	17.7	Freshman Dorm (N)	68.4	31.6
726	82.1	17.9	Freshman Dorm (P)	70.4	29.6
3	68.4	31.6	Other Housing	57.9	42.1
1040	78.7	21.3	Off Campus	52.4	47.6
4098	81.8	18.2	TOTAL	67.2	32.8

FIG participation had a greater effect on persistence, with 75% persisting to graduation vs 63.4% in the non-FIG group. Native American and African American students were the least likely to be retained (60.0% and 68.9%), but due to the low number of Native Americans (N=5) in the study sample the African American group was selected as the reference category as the least likely to be retained. Excluding the single Hawaiian student that was retained, foreign students were the most likely to return (97.0%), followed by students who did not provide ethnicity information (89.6%), Asian students (87.3%), white students (81.9%), and Hispanics (74.7%).

Science majors were the most likely to be retained (96.3%), but fell below business and engineering majors in terms of persistence (73.6% and 71.5%). Students who entered the college intending to pursue humanities and social science

(H&SS) majors, and those enrolled in the Division of Undergraduate Studies (DUS) were the least likely to be retained (64.7% and 58.9%) in terms of premajor, or area of enrollment. DUS students are those who are either undecided or not qualified to enter in other premajor areas. While DUS students were retained a slightly higher rate than H&SS students (78.7% vs 77.9%), DUS was identified as the reference category because it is also the least likely group to persist at only 58.9%.

All groups of students who lived on campus in freshman housing facilities were retained at a rate of 82.1% or better, with the honors and FIG housing demonstrating the strongest retention rates (94.6% and 88.2%). Those who lived in other, non-freshman facilities or off campus were less likely to be retained (68.4% and 78.7%). Off-campus students were selected as the reference category because they were also the least likely to persist at only 52.4%. A total of 18.2% of students in the sample were not retained, and 32.8% failed to complete a bachelor's degree within five years.

Likelihood of Retention and Persistence Based on FIG Participation

The interpretation of the logistic coefficient is interpreted as the odds of an event occurring, and defined as the ratio of probabilities, namely the probability that an event will occur versus the probability that it will not. Factors greater than one indicate an increase in those odds, and factors less than one indicate a decrease (SPSS, 2004).

Q1 – Does the likelihood of retention increase based on FIG participation?

The model demonstrates that FIG participation bears a statistically significant relationship to retention, increasing the odds of retention by a factor of 1.37. Although

significant, a factor 1.37 does not illustrate the degree of impact expected, as the local FIG program was largely viewed as a major asset in the retention of local students (Enrollment Management Group, personal communication, December 8, 2011). According to the campus retention committee the FIG played a crucial role in the 81% freshman retention rate. However, the present model reveals that even though FIG participation bears a statistically significant relationship to retention, it shows little difference between the retention of FIG participants versus non-FIG participants (84.8% vs 80.4%).

Q2 – Does the likelihood of retention increase based on FIG participation?

The model demonstrates that that FIG participation also bears a statistically significant relationship to persistence, better than that of retention (odds=1.37), increasing the odds of persistence by an even greater factor of 1.74. The added value of the FIG program's impact on persistence adds support to the EMG's (2011) claim the FIG program has a positive effect on the anticipated outcomes of retention and persistence. The results of research questions one and two are presented in Table 5.

Table 5

Impact of FIG Participation

Outcome	β	Wald Statistic	*P*	Odds ratio
Retention	.312	12.071	.001	1.37
Persistence	.552	55.129	.000	1.74

Logistic Regression Analysis of Student Retention

Q3 – What is the likelihood of retention when controlling for John Bean's nine themes of college student retention?

Of the nine independent variables available to the regression solution, only five bear a statistically significant relationship to the prediction of retention: student's plans to return, the first-year GPA, housing, premajor, and ethnicity. Only one of the interaction terms, first campus choice x the intent to leave, met the criterion for inclusion in the logistic regression model.

Students' intentions, or plans to return for a third semester, entered the model first. The value for the odds of this variable indicates a decreased in the odds of retention by a factor of .04 that the expectation of a student's return. The negative beta coefficient indicated a negative impact when the binary response moves away from "1" or "yes" the student planned to return. While statistically significant, intentions did little to decrease retention. The interaction term of intentions and first choice campus (i.e. 1 = yes the student planned to return and 1 = yes the local campus was the student's first choice) yielded similar results. The negative beta coefficient for of those variables combined was significant at the .05 level, but only decreased the odds of retention by .34. The student's first-year GPA had a much greater impact; as the first-year GPA rises, the odds of being retained increase by a factor of 2.84.

Housing yielded six separate contrasts, each evaluated against the reference category of off-campus housing. Four components of this variable were nonsignificant at

the .05 level: freshman honors housing and all three freshman dorms. This indicates that, relative to living off-campus, none of these alternatives increased retention. The freshman suites option did increase the odds of retention by a factor of 1.44. It should be noted that this option was only available to students who participated in a FIG. The category of other campus housing had a negative effect relative to living off campus; freshmen placed in those facilities had decreased odds of retention by a factor of .37.

Premajor yielded four separate contrasts, each evaluated against the reference category of the Division of Undergraduate Studies (DUS). The business and science components were nonsignificant, indicating that relative to students enrolled in DUS, enrolling as a business or science student did not increase retention. In fact, science enrollment had a negative effect relative to DUS, but not a significant level. Engineering students' odds of being retained increased by a factor of 1.44 over DUS students. H&SS enrollment decreased the odds of being retained, with an odds ratio of .75.

Ethnicity yielded seven separate contrasts, each evaluated against the reference category of the African American students. The only significant components were foreign students, and those who did not disclose their ethnicity. Foreign students' odds of being retained increased by a factor of 10.84 over African American students, and the odds for those who did not disclose their ethnicity were increased by a factor of 2.14. The results of research question three are presented in Table 6.

Table 6

Logistic Regression of Student Retention

Variable		β	Wald Statistic	*p*	Odds ratio
Intentions		-3.313	167.680	.000	.04
First-Year GPA		1.045	260.727	.000	2.84
Housing			13.112	0.041	
	Freshman Honors	.598	3.024	.082	1.82
	Freshman Suites	.366	4.323	.038	1.44
	Freshman Dorm (L)	.089	.389	.533	1.09
	Freshman Dorm (N)	.065	.219	.640	1.07
	Freshman Dorm (P)	.086	.365	.546	1.09
	Other Campus Housing	-.981	5.200	.023	.37
PreMajor			27.968	.000	
	Business	.234	2.199	.138	1.26
	Engineering	.365	7.343	.007	1.44
	H&SS	-.282	3.783	.052	.75
	Science	-.263	2.973	.085	.77
Ethnicity			24.284	.001	
	Native American	-1.511	2.493	.114	.22
	Hispanic	-.201	.322	.570	.81
	Asian	.740	2.981	.084	2.10
	Hawaiian	20.799	.000	1.000	n/a
	White	-.171	.633	.426	.84
	Foreign	2.383	7.673	.006	10.84
	No Response	0.765	3.801	.051	2.14
First Choice Campus*Intentions		-1.083	4.098	.043	.34

One way to assess the performance of logistic model performs is to compare the outcomes predicted by the model to the outcomes observed in the data, or the goodness of fit. The classification table for the predicted versus observed outcomes displayed in Table 7 and provides an overview of the efficiency of the model.

Table 7

Predicted vs. Observed Outcomes of the Logistic Regression Model for Student Retention

		Predicted Outcome		
Observed Outcome	N	Retained	Not Retained	% Correct
Retained	3354	3313	41	98.8
Not Retained	744	488	256	34.4
			Overall	87.1

Table 6 shows that the logistic regression model including the six significant variables accurately classified most of the students. Roughly 12.8% (488) of those who were predicted to be retained (3801) actually failed to do so, while 13.8% (41) of those not expected to return (297) were retained. Overall, the logistic model successfully classified 87.1% of the study sample. The model is better predictor of retention (98.8% correct) than it is of non-retention (only 34.3% correct).

Relationship to the Literature

The only evaluation of the FIG program was done over ten years ago, and the data measured the academic and social integration and institutional satisfaction of students enrolled in FIGs at that time. Tinto's model of student retention served as the theoretical

framework, and the results supported the premise that learning communities such as FIGs help retain students and aid in their social and academic integration into college (K. Miller, personal communication, June 4, 2012). However, the literature review presented in section 2 maintained that although Tinto's theory of student departure (1975, 1993) is arguably the most used retention theory in higher education, many scholars contend that it focused on social and intellectual integration and neglected the impact of the outside world (Braxton et al., 2013; Stage, 1989; see also Braxton & Brier, 1989; Brower, 1992; Cabrera, Nora, & Castañeda, 1992). The current study results reveal that local FIG participants demonstrate slightly higher retention rates (84.8% vs 80.4%), supporting previous local research and the notion that FIGs aid in social and academic integration.

This study is guided by a framework which is derived from the notion that Tinto's model provides no instructions or explanation on how to develop the academic and social integration that promotes retention within an institution (Bean & Eaton, 2001). Bean's (2005) maintains that there may be a correlation between satisfaction, integration and retention, but that correlation does not necessarily translate into an individual student's personal retention equation. The data analysis revealed that five of the nine themes and one of the interaction terms bear significant relationships to retention; FIG participation was not significant when controlling for additional themes. The examination of external themes helped to identify background variables that may be addressed or manipulated in order to increase the aforementioned satisfaction and integration that has previously been attributed to simply participating in the FIG program.

Relationship to the Conceptual Framework

As summarized in the literature review in section 2, Bean clarified the flow of the model in 2005, and presented the themes in a sequence consistent with the presumed order of importance of each factor on retention. Significant variables entered the regression model, following the order that Bean described, as displayed in Table 8.

Table 8

Presumed vs. Observed Order of the Nine Themes of College Student Retention

Factor Name: Bean's Nine Themes	Presumed Order of Significance	Variable Name	Observed Order of Significance
Intentions	1	Intentions	1
Institutional Fit & Commitment	2	First Choice Campus	n/a
Psychological Processes & Key Attitudes	3	Expected Grades	n/a
Academics	4	Year 1 GPA	2
Social Factors	5	Housing	3
Bureaucratic Factors	6	Premajor	4
External Environment	7	Ethnicity	5
Student's Background	8	Enrollment Index	n/a
Money & Finance	9	Need Index	n/a

The results of the current study support the notion that satisfaction and social integration alone cannot predict retention, and that there are more variables to consider and act upon in order to improve retention. Further, the results of the regression model support the program evaluation goals of providing feedback that may enhance future programming on campus by identifying the type of students who benefitted most from FIG participation, as well as identifying the characteristics of students at risk of not being retained.

Summary and Transition

The alternate hypotheses were substantiated as the FIG was shown to be a statistically significant factor (as measured by p-value < .05) in contributing to the likelihood of retention and persistence to graduation. While significant, however, the impact of the FIG on those outcomes was not great: odds of being retained were increased by a factor of only 1.37, and the odds of persistence by a factor of 1.74. Five factors did prove to have a significant impact on the likelihood of retention: students' intentions, first-year GPA, housing, premajor, and ethnicity. While FIG housing was the only housing component to increase the odds of retention, participation in the FIG was not significant when controlling for John Bean's nine themes of college student retention. The FIG was not included in the prediction model, indicating that FIG did not increase the likelihood of retention at a significant level once other factors were considered.

Logistic regression was used to formulate an empirical model describing the retention patterns of students at the local campus. The model proved to be an effective

predictor of retention, but is an ineffective predictor of non-retention. Overall, the logistic model correctly classifies 87.1% of the study sample, and provided the scholarly foundation to conduct a program evaluation. The evaluation includes further exploration of the significant variables, as well as the characteristics of the non-retained students, and will allow campus personnel to improve local retention and persistence by identifying students in need of targeted, timely, and appropriate outreach and support.

Section 3 will consider the themes observed to be significant predictors of retention at the local campus, as well as the background characteristics observed among both successful and unsuccessful students at the local campus. It will also explore methods for identifying at-risk students, given that the model only predicted attrition with 35% accuracy and should not be used for that purpose. The program evaluation developed as a result of the data collection and analysis will be discussed. Section 3 also includes details on the implications of the project for social change.

Section 4 will include scholarly reflections and the potential for additional research projects on this topic.

Section 3: The Project

Introduction

In Section1 of this study, the problem was identified as the absence of evaluation data on the FIG campus retention program. Research on Bean's (2005) nine themes supported the exploration of retention and persistence in the research setting. The logistic regression analysis presented in Section 2 illustrated that, participation in the FIG had a statistically significant impact on retention and persistence to graduation, and that five of the nine independent variables and one of the interaction terms in the study were statistically significant contributors to retention. In addition, the regression model provided inferential statistics on odds ratios and predicted the probability of retention and persistence at the local campus. The regression model and output data from Section 2 supported the scholarly rationale for the project of this study. Section 3 includes the project goals and rationale, a review of literature on the merits of a program evaluation that could reveal how the findings of this study align with similar research, and a discussion of the formal evaluation of the local FIG program.

Description and Goals

This project addressed a specific gap in local practice: no formal assessments of retention programs had been completed to determine what works in local retention and what does not. Royse, Thyer, and Padgett (2010, 2015) defined program evaluations as an "aspect of professional training aimed at helping (stakeholders) to integrate research and practice skills, using the former to enhance the latter" (p. 1). As such, this study did not aim to inform local stakeholders of the success or failure of the FIG program, but

instead to provide feedback that might (a) enhance future campus retention planning and (b) further its impact on the retention of students most at risk of dropping out. An evaluation is the appropriate project because it addresses a specific gap in local practice: no formal assessments of retention programs have been conducted to determine what does and does not works in local student retention (Enrollment Management Group, personal communication, December 8, 2011). Both the purpose and rationale for this project study evaluation were to highlight the impact of the FIG, to present an explanation of the student factors that impact retention, and to identify the type of students who would benefit most from focused retention efforts. As such, the program evaluation assessed the FIG program's impact on the dependent (response) variables of retention and persistence, as well as on the independent variables (predictors) of nine different themes.

The regression analysis met the overall evaluation goal of verifying the FIG program's effectiveness in order to define the degree of benefit to overall campus retention, as well as the degree of benefit to students with particular characteristics. The results of this analysis were used to inform the project of the study, an evaluation of the local FIG program. Its goals were to present findings on the outcomes of retention and persistence in order to make decisions about the future implementation of retention programming. While this study does not fit neatly into a particular evaluation type (e.g., goal-based, outcomes-based, formative, or summative), the use of logistic regression analysis and the interpretation of inferential statistics is deemed appropriate when analyzing whether or not relationships exist between or among variables (Triola, 2002).

Ultimately, the project helped to create two useful tools: a local evaluation template that can be used to gather empirical data on other retention programs, and a prediction model to identify incoming freshmen who may benefit the most from involvement in support services during their first year of enrollment. The full evaluation report, presented in Appendix A, served as a practical response to the practical need for understanding local retention program effectiveness and using that understanding to guide future program implementation.

Rationale

In Section 2, the regression model showed that participation in a FIG was a statistically significant predictor of retention, and that when controlling for themes that contribute to retention, five of the nine themes and one of the interaction terms were significant, with all of the above entering the model at a *p*-values of <.05. Subsequently, the regression analysis provided data on the odds ratios for FIG retention and persistence, and for the five significant themes, as well as an accurate predicted probability for retention in 87.1% of the study sample. The generation of such predictive data enabled to proposal of enhancements and quality controls to retention program development implementation. Knol, LeCassie, Algra, Vandenbroucke, and Groenwold (2012) supported the idea that regression analysis was a scholarly approach to considering retention and persistence problems by (a) verifying the significance of study variables, (b) calculating odds ratios, and (c) predicting the probability of a binary outcome based on the significant variables (p. 895).

Bonett and Price (2015) and Chen, Cohen and Chen (2010) maintained that odds ratios, predicted probabilities, and the layers of inferential data produced by logistic regression are widely used, valuable measures in two-group studies (e.g., FIG vs no FIG) that assess a dichotomous outcome. Through the work of Bonnet and Price (2015), Knol, et al. (2012), and Chen, Cohen and Chen (2010), the literature revealed that logistic regression was an ideal way to analyze the date collected for this project study. Verifying the FIG program's effectiveness was facilitated by the logistic regression analysis. The resulting model indicated that, separate from participation in the FIG, five of the nine independent variables were statistically significant with regard to retention. Based upon these results, the significant variables warranted individual consideration in the evaluation of local retention programming.

The logistic regression analysis of the FIG program addressed a specific gap in local practice: no formal assessments of retention programs had been conducted to determine what works in local student retention and what does not (Enrollment Management Group, personal communication, December 8, 2011). The data analysis informed the project study evaluation, providing a clear understanding of the degree to which FIG participation impacted retention, a description of the type of students who would benefit most from FIG participation, and recommendations for the future retention program efforts and implementation. While the findings of the project do not provide an absolute solution to the local data analysis and retention issues, the local campus and the university system to which it belongs may use this study approach and evaluation to

inform decision-making and program planning pertaining to student recruitment, retention, support, and persistence.

Review of the Literature

Following the efforts considered to find related literature in Section 1, efforts for Section 2 also included multiple search terms (e.g. regression analysis, program evaluation, program effectiveness, freshman interest groups, college students, intentions, GPA, housing status, major, enrollment, and ethnicity) and database aggregators, and Boolean operators. recommendations. This lead to a rich collection of journal articles from with to prepare the following literature review on the project.

Logistic regression analysis supported the goal in this project of providing a clear understanding of the degree to which FIG participation impacted retention, and to identify the type of students who would benefit most from participation. By producing statistically empirical significant data on overall retention and independent variables that affect retention, the regression model lays the groundwork to inform campus retention efforts. For those reasons, logistic regression analysis provided the scholarly rationale for conducting this evaluation of the local FIG program.

Through an exploration of regression model applications that provide a further scholarly basis for this project study evaluation, Reichenheim and Coutinho (2010) reported that with the ability to offer information to calculate binary outcomes (i.e., retained or not retained), logistic regression analysis provides a level of quality control on processes within a research setting. In this project study, the predictive statistics from the regression analysis were used to evaluate the FIG program and present recommendations

to refine various recruitment and retention activities. Thus, in considering the research by Reichenheim and Coutinho (2010), by refining activities, the program evaluation in this study implemented quality control measures through the assessment of the FIG program.

The need to implement quality controls and influence decision-making has led to a rapid increase in the use of program evaluations (Furubo & Vestman, 2011; Posavac, 2016). J. Kim (2011) provided a model for using a program evaluation as a quality control assessment by recommending and implementing productive changes in the curriculum of an undergraduate technical program (p. 481). Y. Kim (2011) suggested that assessing the strengths and weaknesses of a program and its relevant components is a functional tool for gauging the overall quality of any educational program (p. 305). Substantiating the program evaluation as a standard of quality control for a retention program provided the scholarly basis for how the lack of evaluation data was addressed through the content of this project.

Logistic regression models provide an effective for predicting the influence of the independent variables on dichotomous outcomes (Stoltzfus, 2011, p. 1099). Because this evaluation of the FIG program considered the need for empirical data on program effectiveness and the independent variables that affect retention, logistic regression model provided the scholarly rationale to guide such a project. Using the data from the regression model, this evaluation sought to increase or enhance overall campus retention efforts. Accordingly, this program evaluation provides an instrument of quality control for assessing and addressing campus retention program standards at the local campus.

Criterion for Project Development

Research on evaluation, by evaluators, dates back to the 1970's, with what Henry and Mark (2003) labeled, the "golden age" (p. 294) of evaluation research. The seminal works of Alkin, Daillak and White (1979), Patton et al. (1977), and Weiss and Bucuvalas (1980) informed the current understanding of best practices drawn from empirical data. In recent years, evaluation scholars have shifted their attention from theories on the art of conducting and interpreting evaluations to the practice of creating predictive models that focus on outcomes that go beyond the evaluation findings (Contandriopouos, 2012; Dillman, 2012; Luskin & Ho, 2012). In the case of the local FIG program that translates to an evaluation of the retention outcome and student characteristics for the purpose of developing practical interventions for specific target groups.

DiNardo and Lee (2011) defined program evaluation as "any systemic attempt to collect and analyze information about the implementation and outcomes of a "program" – a set of policies and procedures (p. 469). The ultimate purpose of an evaluation is to create greater understanding; program evaluations are largely conducted to improve educational efforts and to inform the parties responsible for those efforts. In the case of this project study, these purposes translate into the specific goals of helping others through program of improvement, such as verifying FIG program effectiveness, and measuring specific factors that affect retention. Once these goals were identified the evaluation type was selected; the type of evaluation was determined by the type of problem.

According to DiNardo and Lee (2011), the lack of evaluation data is an *ex-post evaluation problem,* meaning that the main goal is to determine what happened

(retention, persistence) as a result of a particular intervention (FIG participation). Although it was understood that the nature of this study did not fit neatly into a particular evaluation type (e.g., goal-based, outcomes-based, formative, or summative), the best fit was an outcomes-based, summative evaluation, which investigates whether or not a program demonstrated an effect on an outcome (Trochim, 2012).

Despite the number of factors that have been studied pertaining to retention, academic success cannot be explained through a single framework (Bean, 2005; Tinto, 1993, 2006). In a study that explored the personal resources and factors student themselves believed contributed to successful outcomes, Stelnicki, Nordstokke and Saklofske (2015) noted that researchers' understanding of student success remain largely unknown. This position aligned with that presented by Valentine et al., (2011), that educators need more rigorous studies that investigate specific factors and student characteristics that are linked to success.

Interconnected Analysis of Study Results

Connecting the literature to the study results employed the following considerations: (a) effective learning communities and the five themes observed to be significant predictors of retention at the local campus; (b) the background characteristics observed among both successful and unsuccessful students at the local campus; and (c) strategies for identifying at-risk students.

FIG Program Effectiveness. The logistic regression in Section 2 showed that FIG participation was statistically significant in relation to retention and persistence with respective *p*-values of .001 and .000, indicating that participation in a learning

community such as the FIG should be included among various applications in the proposed recommendations. Appropriately, the following information from the literature supported the implementation of learning community options to improve retention results.

Heaney and Fisher (2011), and Tampke and Durodoye (2013), affirmed the benefits of learning communities for at-risk students, whether in stand-alone courses, multiple courses, or nonacademic peer groups, through works that investigated students' entry characteristics. Undecided students and those with other apparent risk factors (i.e. housing status and ethnicity) in particular were found to experience added benefits from the self-regulating and critical thinking content presented in the learning communities that were evaluated. Incorporating skills content with academic content in a formal setting demonstrates an effort to provide innovations that produce both quality education and well-supported students in higher education (Baum, Kurose, & McPherson, 2013; Popiolek, Fine, & Eilman, 2013).

After examining three learning community models that were designed with the central theme of cultivating meaningful connections between students, faculty, and course content, Zrull, Rocheleau, Smith, and Bergman (2012) found that the variation in the models demonstrated both the flexibility and feasibility of implementing learning communities in various university settings and across various disciplines. Residential learning communities in particular have been developed in response to calls for integrated and focused learning to support curricular disciplines that often exhibit lower student

retention rates (Grills, Fingerhut, Thadani, & Machón, 2012; Matthews, Smith & MacGregor, 2012).

In 2008 Loyola Marymount University established a residential learning community for first-semester psychology students, which linked academic and social experiences in order to create a setting that focused on both learning, academic progress, personal development (Grills, Fingerhut, Thadani, & Machón, 2012). The desired outcomes for first semester psychology majors were that students should:

- Feel a sense of community, bonding, and engagement to peers, faculty, the broader educational community, and the field of psychology;
- Feel supported by peers, faculty, and the broader university community;
- Feel a sense of engagement in class;
- Take responsibility for their own learning and that of their peers;
- Use collaboration and teaming strategies to enhance their educational potential;
- Value opportunities for exploration and value intellectual pursuits in higher education;
- Demonstrate greater awareness of available resources at the university and greater knowledge of how to access them;
- Demonstrate improved academic outcomes, as evidenced by GPA in both their major and LMU's core courses and through higher retention rates.

(p. 47)

These desired outcomes could be applied to any learning community, and served as an underlying theme in the recommendations presented in the FIG program evaluation report.

Students' Intentions. The logistic regression showed that student intentions and first-year GPA were strong predictors of retention, with *p*-value of .000 for both variables. While these results were expected, it is important to remember Pascarella's (1984) causal model which emphasized that it is a combined web of factors that leads to an individual student's expectations, persistence, and ultimately, retention.

Erickson and Stone's (2012) 2-year review showed no correlation between students' institutional connectedness and retention, although the correlation between students' expectations and intention to return was significant. They argued that in order to enhance intent, or lack thereof, it must be determined a full year beforehand. Morrow and Ackerman (2012) studied college freshmen who were not retained for the sophomore year and found that positive motivational attitudes proved to be significant predictors of students' intention to persist, as did students' sense of perceived support for faculty and their peers. A study on the impact of students' self-efficacy and social self-efficacy on student persistence found that students attending institutions they believed to be less selective were less likely to persist (Elliot, 2016). These studies offered some insight to the current campus and the present study, as the logistic regression results for students' campus preference was found to be significant as part of the first choice campus*intentions interaction term (*p*-value of .043), supporting the local presumption that students who did not select the local campus as their first choice are less likely to

intend to return, and that students who do not feel connected to campus are not motivated to return. The use of such data from the start of a student's interaction with a college is key to exploring, understanding, and addressing institution commitment issues (Davidson, Beck, & Grisaffe, 2015; Mattern, Shaw, & Kobrin, 2011; Thomas, 2014).

First-Year GPA. The first-year GPA was also a significant variable in the regression model, with *p*-value of .000. Similar to the factors of intentions and institutional fit, waiting until the student has completed their first year to implement retention efforts does little to improve second to third semester retention. To that end, campuses are advised to look beyond admissions criteria and include other, non-cognitive and pre-enrollment factors that impact academic performance (David et al., 2015; Friedman & Mandel, 2011). Rather, the focus should be on identifying students in need of early academic interventions that will support stronger grades throughout the first year in order to prevent them from dropping or failing out of school.

In addition to first-year progress and non-cognitive factors, Nara, Barlow, and Crisp (2005) identified the need to better understand retention beyond the third semester as a significant predictor of persistence to graduation, and argued that entrance characteristics associated with retaining first-year students do not fully explain retention beyond the sophomore year. In response to that challenge, Raju and Schumacker (2015) used a series of data mining techniques to better understand freshmen student variables that lead to graduation. The study reviewed the records of 22,099 first-time, full-time freshman enrolled from 1995-2005 and found that of the 7,293 students (39%) who did not graduate, 2,845 students (39%) earned less than 12 credits with a GPA<2.5 in their

first semester (p. 563). Gershenfeld, Hood, and Zhan (2016) found this to be of particular significance to Hispanic and African American students, and argued that first-semester GPA is an essential predictor of graduation for those student groups.

Raju and Schumacker (2015) found that while entrance characteristics and non-cognitive factors are good predictors of retention and subsequent graduation, including first-semester data in the model provides a better prediction of student graduation. Local campus stakeholders should use the earliest data available to identify students at risk of not being retained or persisting to graduation, including the first-semester completion data, in order to identify students in need of targeted support programs during the rest of their first year and beyond.

Housing Status. Lastly, the logistic regression showed that students housing status, premajor, and ethnicity were significant predictors of retention at the local campus, with *p*-values of .041, .000, and .001, respectively. The contrasts under each factor provide valuable insight to the recommendations for retention programming, including the development of specific learning community options for targeted groups.

There are housing status implications for this evaluation. Silva et al. (2015) explored the impact of unique barriers to housing status (i.e. limited options and/or resources) on student retention, and found that such barriers had a negative effect on students' academic success. This should not be unexpected on any campus, particularly those in a setting that lacks a community college option for students from low-performing, inner city schools, such as that of the local campus (Enrollment Management Group, personal communication, December 8, 2011). Tinto encouraged the creation of a

caring and inclusive institutional climate that strives to support and retain students (1987). Efforts to do so fill a gap for off-campus students in need of meaningful connections to their campus (Laskey & Hetzel, 2011) and to the college environment of their peers (Gajewski & Mather, 2015).

With respect to meaningful connections, influential authors on the topic of student development, engagement, and retention have offered explanations on the influences and effective components of successful student initiatives. After decades of research on college students, Alexander Astin argued that "the single most important environmental influence on student development is the peer group. By judicious and imaginative use of peer groups, any college or university can substantially strengthen its impact on students learning and personal development" (Astin, 1993, p.xxii). The second influence is the regularity of faculty-student interactions, and the third is extent of students' active participation in those interactions (Astin, 1993).

George Kuh's research collaborations on student engagement culminated with *Success in College: Creating Conditions the Matter* (Kuh, Kinzie, Schuh, & Whitt, 2005), asserting the following:

> What students *do* in college counts more in terms of what they learn and whether they will persist in college than who they are or even where they go to college. That is, the voluminous research on college student development shows that the time and energy students devote to educationally purposeful activities is the single best predictor of their learning and personal development. (Kuh et al., 2005, p. 8)

The authors agreed with Astin (1993) and reasoned the that the most effective components of activities that support student success are the time and effort that students put towards their academics and other meaningful interactions, and "the ways the institution allocates resources and organized learning opportunities and services to induce students to participate in and benefit from such activities" (Kuh et al., 2005, p. 9). Well-funded and stakeholder-supported learning communities, particularly for students who lack the connection to their peers and the campus community through on-campus housing, should be included in local campus retention efforts to provide students with meaningful connections to the campus, its faculty, and their peers.

School of Enrollment. Not only can the living environment contribute to the peer experience of a college education, students' attachment to their major area of study, the premajor, plays a role in retention. Harvey and Luckman found that retention rates vary considerably by course of study, students' preference for and understanding of their academic plan is strongly correlated to success in a chosen program (2014; Nelson & Creagh, 2013). Within various premajors, instructors who are committed to supporting underprepared or undecided students can enhance the first semester experience with meaningful connections to the content being taught (Anderson, 2013). In doing so, curriculum-based learning communities are positioned to incorporate Astin's (1993) three major environmental influences by creating opportunities for students to: (a) engage with peers who have similar interests and/or goals; (b) interact with faculty whose expertise lies in the interest/goal area of study; and (c) actively participate that engagement and interaction through required coursework (Love, 2012). Curriculum-based options are also

positioned to address remediation and attrition needs, by incorporating supportive and content specific learning strategies and pedagogies (Matthews, Smith & MacGregor, 2012).

As focused learning communities have emerged they have increasingly addressed remedial students' needs while also supporting retention efforts for a more general student population (Rudd, Budziszewski, & Litzinger, 2014). A thorough examination of retention by school of enrollment and/or specific majors allows campuses to allocate resources and personnel to the students and majors that my benefit most from curriculum-based learning communities (Coates, 2014; Davis, Burgher, & Jefferson, 2013). Local campus curricula already include opportunities for students who have a clear vision and demonstrate the prerequisite skill levels to engage with each other and with faculty in an academic environment. Therefore, targeted interventions for undecided students, those not admitted into their first choice of majors, and students' enrolled in low preference majors are included in the program evaluation report.

Ethnicity. The results affirm that ethnicity has a significant effect on retention. These findings are consistent with recent research conducted several decades ago (Astin, 1971; Pascarella & Terenzini, 1978; Peng & Fetters, 1978). A recent study by Stewart, Lim and Kim revealed interesting results: while ethnic group comparisons bared significant differences, there was no significant interaction between ethnicity and retention interventions, meaning that the retention results for different ethnicities did not depend on students' level of participation in different interventions (2015). The variation in needs, culture, and support systems for different ethnic groups requires a varied

approach to addressing transitional issues (Flores & Park, 2013; Johnson, 2013; Stewart, Lim & Kim, 2015). Therefore, the recommendations for different ethnic groups will address the interconnected implications of housing and premajor in an attempt to provide comprehensive system of outreach and support.

Stephens, Brannon, Markus, and Nelson (2015) presented an argument for implementing such a varied approach, including the need for changes in ideas and practices to enhance the academic performance of minority students. These practices include cultivating fit within the campus community so that students may recognize and understand their value, and cultivating a sense of empowerment so that students may appreciate and lean on their cultural experiences and differences as they seek resources and support (Stephens et al., 2015). Stakeholders are advised to remember that minority students who attend predominantly white colleges are less likely to feel that they are part of the campus community, and that this alone may lead to dissatisfaction and the decision not to return (Baker & Robnett, 2012).

Kuh et al. provided a framework for successful student engagement programs, which at the local campus could inform retention programming or targeted efforts pertaining to housing status, school of enrollment, or ethnicity. They argued that the following principles are necessary for programs to be successful:

- a “living” mission and “lived” educational philosophy;
- an unshakeable focus on student learning;
- environments adapted for educational enrichment;
- clearly marked pathways to student success;

- an improvement oriented ethos;
- shared responsibility for educational quality and student success (p. 24)

Summary

The college environment, containing both academic and social subsystems, can affect student intentions and commitments both positively and negatively. Efforts to enhance the first year of college for students has been a topic of much discussion and research, particularly since the 1980's. Learning community models originated in the 1920's but have more recently emerged as an effective option for institutions to provide greater structure and coherence for new students. FIGs have developed into frequently used learning community models among institutions given their simplicity and low cost (Gabelnick et al., 1990). Retention efforts are being made by many units of the local campus community, but with occasional lack of coordination or communication between departments. The rigorous analysis employed by this project study supported an understanding of student data the subsequent recommendations that will strengthen retention efforts on campus.

The themes of program evaluation in any setting are change, improvement, and quality; as student populations change, studies that control for multiple factors are needed in order to make meaningful comparisons and understand the implications for both students and institutions (Forsman et al., 2015; Pleskac, Diederich, & Wallsten, 2015). In consideration of what to change and where to make improvements, Bers (2011) noted that evaluators must analyze the data and identify a logical approach to making relevant program recommendations, and that both steps must be done prior to conducting the

program review (p. 63). While the majority of learning community research has been conducted at large institutions or community colleges where they are implemented to create smaller learning environments within a large setting, little exploration has been conducted to increase the general understanding of the impact that FIGs, specifically, have had on smaller settings.

This evaluation project was not intended as a report on the success or failure of the FIG program, but rather as a means of influencing future retention programming on campus. Therefore, a study that provided empirically based evidence of program effectiveness was conducted to help the campus community recognize and celebrate or review and design programs that could play a critical role in promoting retention and persistence of all students through graduation.

Promoting student retention and success is of utmost importance to the local campus and similar institutions striving to affect social change, because a clear understanding of opportunities to support student retention and persistence will extend beyond that of individual students' success and demonstrate both local and far reaching implications through the development responsible, productive, and prepared students. Comprehensive and on-going retention data collection and analysis is required, including the identification and tracking of data likely to influence retention, particularly for incoming freshmen identified as those who may benefit the most from involvement in retention programs during their first year of enrollment.

The evaluation that followed the analysis addressed the implementation and planning of retention initiatives, which is an individual institutional concern that is

closely tied to current strategic plans and to the overall mission of the institution. The literature reviewed above justified regression analysis as a logical approach to the local problem of a lack of evaluation data, supported the development of the evaluation project, and connected the results to literature that informed that recommendations presented in the evaluation report.

Implementation

The director of enrollment management at the local campus assigned the responsibility for coordinating campus retention program assessments to the campus retention coordinator (the researcher). The most recent semi-annual performance review with the director of enrollment management included a presentation of the study findings and evaluation report, which includes suggestions for new living & learning community options, outreach content, and timelines for both prospective and current students. The new performance objectives outlined in that review served as plan for implementing the reported recommendations.

Potential Resources and Existing Supports

The campus Enrollment Management Group (EMG) serves as a sounding board for retention issues and initiatives, and is a valuable resource for the retention coordinator. It includes representatives from the offices of admissions, financial, registrar, bursar, academic and career planning, housing, academic affairs, and student affairs. Each representative has a role to play a role in sharing the evaluation results with their departments, deciding whether or not to include those recommendations in future department protocols, and offering suggestions for improvement of the initiatives they

choose or are directed to undertake. While collaboration with EMG members and additional support staff will aid in the implementation of the recommendations, the retention coordinator will serve as the point-person for any questions or concerns pertaining to the research design and study results.

Potential Barriers

The major barrier to the reception of the evaluation report and implementation of the recommendations is the fact that the local FIG program was discontinued. One reason for the discontinuation mirrors the problem addressed by this project study: the lack of empirical data on the effectiveness of the program. The foremost reason was that the task of administering the program, placing the students in residence halls with various options for linking courses offered, and overseeing the student leaders grew to be a burden for the responsible staff, and it was no longer viewed as being worth the time and effort. The recommendation to revisit new living & learning community options may be met with some reservations.

Proposal for Implementation and Timetable

The evaluation report will be presented to the Enrollment Management Group upon the approval of this project study in the fall of 2016. This aligns the commencement of any of the proposed recommendations, for both current and prospective students, with the start of the 2016-17 academic year and 2017-18 recruitment cycle. Reports back to the group and feedback from responsible parties will take place at the quarterly EMG meetings.

Roles and Responsibilities of Student and Others

The retention coordinator will be responsible for creating outreach materials, introducing a revised living and learning experience for residential students, and presenting a calendar of events for the target groups to accompany the written report. Each of the recommendations included in the report suggests a department representative to collaborate with the retention coordinator on the implementation task(s), but the representatives may delegate responsibility to colleagues, support staff, or student workers. The departments named include: admissions, registrar, academic and career planning center, school of business, school of engineering, school or science, school humanities and social sciences, student activities, residence life, housing and food services, educational equity and diversity, and strategic communications.

Ongoing Evaluation

Implementation will take place over the 2016-17 academic year and the objectives will be reviewed on a quarterly basis for feedback from the Enrollment Management Group. The retention coordinator will seek regular feedback from students, faculty, staff, and administrators to determine the strengths and weaknesses of the actions steps as they are implemented. This information will be presented to the EMG to demonstrate task completion, an overview of what has worked and what has not, as well as to seek further guidance on the continuation, modification, or discontinuation of plans. The plan will be reviewed through an analysis of current students' academic performance and intentions to return for the third semester. Outreach to prospective students will begin at the end of the academic year in order to start the process over again. Retention rates will be calculated

for each cohort of students, as well as for specific target groups, and persistence rates will be tracked as they progress through their academic plans. This reiterative process will continue, and changes will be made as appropriate for each cycle.

Implications for Social Change

The purpose of this project study evaluation was to provide a clear understanding of the degree to which FIG participation impacts retention, and to identify the type of students who would benefit most from FIG participation. While the foremost goal of this project study was to identify opportunities to support student retention and persistence to graduation, the possibilities for social change extend beyond that of the individual students' success and demonstrate both local and far reaching implications for those involved.

Local Setting

The foremost group that will benefit from this study in the local community is the students who will be retained and persist to graduation. The recommendations target specific groups with specific initiatives to improve their education experience through retention and degree attainment. The findings of this study, showing which independent variables were statistically significant with regard to retention, provide an impetus for change within the local student body by informing targeted strategies to enhance and increase programming, engage additional stakeholders, and encourage participation in retention activities. Additional opportunities to reach students exists by conducting similar analyses of retention and persistence results could be conducted with relative ease in order to explore any differences in the significant variable and implement different

interventions based on those results. Examples include athletes, conditionally admitted students, adult students, students who claim specific majors, or students from specific high schools.

While the results of program evaluation are intended to benefit school administrators and educators by improving institutional effectiveness, the students receive the ultimate benefits of any recommendations designed to improve program effectiveness from an evaluation (Horn, 2011, p. 90.). Educational institutions aim to provide academic and student support services that sustain students towards degree attainment, and this study supports that goal. Supporting initiatives that benefit students is important to other stakeholders within the local community, namely the families, faculty, staff, and administrators who support students' as they strive to achieve their goals. A functional, reiterative evaluation process enables the local campus to involve various stakeholders in the retention and persistence process, adding personal and professional value to those engaged in supporting student success.

Far-Reaching

This study can facilitate social change in the larger context by providing a template for program evaluation to other campuses within the university system. Each campus collects the same data sets, and employs staff with access to the same data storage systems. A system-wide understanding and approach to retention would add to the university's commitment to team work and collaboration among the different campus locations, and would provide a baseline for comparison, collaboration, shared services, and support by enabling the campuses use what they have to inform what can be done.

Other institutions could also apply the template, after modifying it to align their own the site-specific data the variables, and use their findings to inform or enhance campus retention efforts. Even though the results of this study cannot be directly applied elsewhere, any institution that needs to verify program effectiveness or identify factors that impact retention on their campus could apply a similar rationale, methodology, and evaluation project to their educational setting. Student retention and persistence problems will never be solved, but there is great potential to make improvements and affect positive social change by supporting the development of responsible, productive, and prepared students.

Conclusion

The goal of this project was to provide feedback to verify the FIG program's effectiveness and to produce an evaluation report that may enhance future campus retention planning and initiatives. Section 3 considered a program evaluation as the appropriate project genre for the local problem, based on the results of the logistic regression analysis in Section 2. A review of existing literature on program evaluations and the significant study variables supported the content of the evaluation report, which outlines the impact of the local FIG program and the characteristics of students at risk of not being retained. This research effort concludes in the following section with reflections on the project, an analysis of self as a scholar, practitioner, project developer, and implications for social change and future research.

Section 4: Reflections and Conclusions

This study addressed a local educational problem: the absence of evaluation data on the FIG campus retention program by collecting and analyzing preexisting data on two groups, those who participated in the FIG and those who did not (no FIG). A logistic regression model was constructed from the data in order to guide future retention program efforts with an evaluation report. The logistic regression analysis provided the rationale for the program evaluation as well as subsequent recommendations for assessing current programs and strengthening local retention efforts. Section 4, which concludes the study, covers the following topics: issues of project strengths and limitations, scholarship, project development, leadership, self-analysis, social change, and retention program implications, application, and recommendations.

Project Strengths

The program evaluation has several strengths, most significant being that it addressed the local problem of an absence of evaluation data on the FIG. Since the program's inception over a decade ago, the only evaluation measured the academic and social integration and institutional satisfaction of students enrolled in the FIG at that time; the effect of FIG participation on retention was not considered. Without such consideration, no assumptions or recommendations could be made to identify students who would benefit most from participation in the FIG.

Not only can program evaluations local problems, conducting program evaluations in higher education provide critical support for decisions that will affect programs and practices aimed at promoting student success and institutional

improvements (Sarrico, Rosa, Teixeira & Cardoso, 2010). As such, the local project study evaluation may provide an assessment model for other retention programs at the local campus and throughout the university system to which it belongs. The analytical method and data sets used have already been identified and justified, and a coding system is in place.

This project sought to inform the campus community and effect change in the local setting. Assessing retention through the lens of a program evaluation provided a unique opportunity to examine specific factors that affect retention in a specific location. Program evaluations in educational settings allow practitioners to examine issues that have both academic and administrative aspects (Darussalam, 2010). The FIG program evaluation offers two additional strengths: the report identified specific characteristics that could be manipulated or further examined to better understand local retention issues, and it made recommendations for focused attention from various stakeholders, both academic and administrative, based on the current findings.

Project Limitations

Though the findings are limited to the local population and campus, the same methods could be used to evaluate other populations, both locally and at other campuses within the system, and the very large study sample reduces the impact of only including four cohorts. The perspective of the final report is limited by the absence of qualitative inductions. Fardows (2011) contends that student perceptions must be considered in order to produce an effective evaluation. This study attempts to mitigate that limitation through the first literature review supporting the use of a framework that examines external

factors that can be measured using existing data, and the second literature regarding the factors found to be significant. The reviews provide a qualitative voice to the local retention problem, study methods, and impact. While a more robust evaluation could have been conducted with the inclusion of qualitative data, the chosen method provided adequate and ample results for the purpose of addressing the lack of evaluation data at the local campus.

The purpose of this evaluation was not to inform the local campus community regarding the success or failure of the FIG program, nor to explore students' perceptions or attitudes towards their involvement in a FIG. Rather, the purpose was to provide feedback that may enhance future programming on campus by identifying the type of students who benefitted most from participation, as well as to highlight the characteristics of students at risk of not being retained. Spaulding (2008) defined an outcomes based evaluation as one that can verify or increase the impact of products or services on customers or clients. Therefore, an outcomes based evaluation was conducted. Had the goal been to assess students' perceptions and attitudes, a qualitative method would have been appropriate, as it would allow for the exploration of program content and answer questions pertaining to the causes of or approaches to addressing their individual retention issues. The nature of this study does not fit neatly into a particular evaluation type, but other options include a case study which would allow for the collection of rich, contextual data on perceptions and attitudes, or a focus group to answer qualitative questions regarding students' understanding of how their individual characteristics impact their FIG experience.

Scholarship

The practice or requiring doctoral students to immerse themselves into the world of scholarship and exploring a body of knowledge have enhanced my understanding and respect for the role of research in solving local problems. Completing this project has changed my approach to my work and anchored my commitment to Walden's vision of preparing students to become scholar-practitioners who are capable of creating positive social change based on ethical research. Merriam-Webster's Online Dictionary (2014) defined scholarship as "the character, qualities, activity, or attainments of a scholar." As I reflect on the years and tears spent on this project, I hope that I am closer to embodying that definition.

I have learned that critical thinking did not come naturally for me, at first, but as I progressed through the process I was able to identify that shortcoming and seek help. The interactions I've had with both my research committee members and colleagues at my research institution have helped me to gain the confidence and understanding necessary for addressing issues with a critical eye, as well as a tremendous amount of respect for researchers who contribute to the body of knowledge in their fields.

There were many moments of skepticism on my part. Could I do this work? Were all of the steps and edits necessary? I am now convinced that the Administrator Leadership program was designed to help higher education professionals like me understand and appreciate the importance of research, questioning, and a thorough analysis of data in order to develop into a scholar-practitioner who is prepared to add to a

body of knowledge and meaningfully contribute to the advancement of my institution's goals to retain students and support their persistence to graduation.

Progressing through my own emotions and stress was perhaps the most challenging, but I was emotionally driven to find answers to retention issues that students face in order to better serve them. I have come to understand that conducting research and completing this project was a necessary part of my development as a higher education professional and as a champion for the students I work with, and that it separates me from those who have not seen their doctoral process through.

Project Development and Evaluation

When I first started this program I was working in a different job and had a different vision for my research. I had big plans: a mixed methods study involving a quantitative survey of thousands of high students involved in a federally-funded college access program, followed by qualitative focus groups to further explain the quantitative findings. Life threw me a few curve balls. First, I requested a qualitative faculty member whom I had met at my academic residency, with the intent of him serving as my second committee member. This was because I had requested the faculty member who was the instructor of the class I was enrolled in at the time to guide me through the large quantitative portion, as we had been brainstorming about my study plans over the course of that term. I am happy to say that I was matched with the qualitative faculty member as my committee chair, as I believe I needed his particular guidance and mentoring style to become a better student and critical thinker. Thankfully he convinced me that my plan was too complicated, and that I should simplify my study. We settled on a qualitative

study, as that is his area of expertise, and I thought I could do it. I was wrong. I struggled for a long time, to make some form of qualitative research work in my head.

My next hurdle was the end of my employment with the college access program due to the loss of grant funds. I did find my current job as the retention coordinator at a nearby university, and decided on the FIG program evaluation. Another year passed as I tried to make a qualitative study make sense to me. I will be forever grateful for the guidance, patience, and support that my chair has extended to me, but there were times that I felt that we were speaking different languages – because we were. It became evident that I had to switch gears, follow my initial preference, and design a quantitative study. He agreed and supported the change. This has been a long, long process, but I am pleased with my project and with the practical use I will get out of the regression model. What did I learn? I learned to be patient, to be honest with myself, to appreciate the vast knowledge that my committee chair had to share with me, to be willing to adapt when unintended educational detours arise, and to muscle through. In the end, I have a greater appreciation for qualitative research, I developed experience conducting quantitative research, and I understand that project development requires patience and persistence.

Leadership and Change

If I had to do it all over again I would approach this project differently. Put simply, I would listen more intently to my professors and take them seriously when they stressed the importance of moving along. I allowed outside stressors to dictate my progress, and I would my best not to let that happen again. Perhaps is would have been a more enjoyable and less stressful experience had I done so. That being said, I am

confident that this experience has facilitated my development as a scholar-practitioner who is capable of using research to address local problems. My goal in pursuing this degree was to be better able to help the students I work with and to be able to meaningfully contribute to any efforts to affect social change through the development of responsible, productive, and prepared students. Mission accomplished.

Analysis of Self as Scholar

I am nearing nine years as a student in this program, which has given me ample time to reflect on my development, or lack thereof, as a scholar-practitioner. There have been many times that I doubted my ability to complete the program, and there have been many times that I have been excited about my project and the work ahead of me. Overall I am satisfied with my Walden experience and the opportunities it has afforded me to be challenged and supported by my research committee members, other faculty members, program coordinators, academic advisors, and peers. Although it has been a challenge, completing this project study has nurtured my confidence and enabled me to comfortably discuss scholarly endeavors with veteran researchers at my local campus. The Administrator Leadership for Teaching and Learning program has taught me how to present ideas based on current research, how to use research to answer questions that emerge in my daily responsibilities, and has helped me to evolve into an agent of change.

I have an Associate's Degree in math and science, a Bachelor's Degree in sports medicine, a Master's of Science degree in organizational leadership, and some graduate work in TESOL (teaching English to speakers of other languages). Throughout this process I have been motivated to draw upon all of my educational experiences in order to

grow as student support professional and social change agent. I believe that my solid intellectual foundation coupled with applied research experience will serve me well in my future professional endeavors. Moving forward my goal is to advance in my career in student support programs by pursuing and initiating additional administrative assignments, and participating in research projects locally and within the university system, and sharing research findings with my student retention peers.

Analysis of Self as Practitioner

One of my primary goals as a student retention professional is to help underprepared and underrepresented students access support and meet their educational goals. In recent years I increased my focus on minority, low-income, and New American (refugee) students. The planning and implementation of this project has helped me to remember my role in student retention, and my role at my institution: I must not only focus on those groups, but on the retention of all students. Students from all backgrounds can be at risk, and my efforts must include consideration for all of them. With that in mind I can see myself contributing to campus on a meaningful level. I am able to present my position and recommendations for various student populations in a manner that can be used by the administration, and my work on campus is respected. This process has helped me to appreciate the need to constantly reflect on past practices, revise current work, and seek new opportunities to learn. These are lessons that will always serve me well, both professionally as a scholar-practitioner and personally as a single mom trying to raise a young man. As I progress through professional and personal life chapters I will recall my doctoral program experience as having prepared me to meet any challenge.

Analysis of Self as Project Developer

The project development phase proved to me that there is no substitute for the experience of experts. I count myself lucky to have a patient and supportive methods committee member, who walked me through the development of my research methods using baby steps. That, combined with access to a helpful statistics professor and guidance from several colleagues with experience in research and enrollment management made the development of my project an enjoyable experience – once I finally settled on a topic and methodology. Having multiple "team members" to rely on added perspective to my critical thinking processes and was a great source of support the way.

Before I started my project I did not fully grasp the degree of complexity expected for each element of the study. I now have a good understanding what is involved in designing evaluation project studies; the rubric was a great help, and I will continue to use that as a guide when designing and conducting program assessments. This project provided an opportunity to stretch my critical thinking skills, develop practical research experience, and hone my writing and presentation skills. I feel prepared to take on addition evaluation projects in the future.

The Project's Potential Impact on Social Change

There were no surprises in the study results, but the data serves the intended purpose: to help the campus community review and design outreach and interventions that promote retention and persistence of all students through graduation. The findings from this study indicate that students' intentions, first-year GPA, housing status,

premajor, and ethnicity are significant predictors of retention. The descriptive statistics outline the retention and persistence outcomes for the applicable subgroups in those categories. Utilizing both sets of empirical results will support the efforts to focus attention where it is needed most, by quantifying campus retention history, informing interventions for students identified to be at-risk of not being retained, and customizing outreach efforts that target students who are predicted to be retained. This information has the potential to meaningfully impact social change at the local level by helping to both recruit and retain students based on their particular needs, interests and strengths.

Retention is shared institutional concern that is closely tied to the strategic plans and mission of the institution, and efforts are being made by many units of the local campus community. This project is a first step in the direction of regular, comprehensive and on-going retention data collection and analysis, as well as a refreshed coordination and communication between departments expected to share responsibilities for the implementation and planning of retention initiatives. Across the board, emphasis is placed on college and university administrators, faculty, and staff in terms of knowing who they serve and how they serve them, committing themselves to enhancing the existing culture, and doing better at what they do best. This project supports that emphasis, and the potential to have a significant impact on social change by promoting an empirically informed, widely shared, and focused effort to improve campus retention and persistence at the local level.

Education in general and retention programs specifically are often automatically viewed as having imbedded value (Brown, 1979), but in higher education few programs

can be presented as such without research-based evidence (Loots, 2008; Venter, 2008). The issue of promoting student retention and success is of utmost importance to the campus and other institutions striving to affect social change through the development of responsible, productive, and prepared students. Beyond the local level, this project could certainly be replicated at campuses throughout the university system, as they all have access to the same data. This would create a unified front for campuses in a system whose mission is to advance the economic, social, and intellectual welfare of the region through research and outreach.

Implications, Applications, and Directions for Future Research

Implications

The purpose of this project study was to provide a clear understanding of the degree to which FIG participation impacts retention, and to identify the type of students who would benefit most from such participation. Local campus in this study is increasingly charged with implementing retention programs that have been proven effective through rigorous research. The quantitative program evaluation addressed a specific gap in local practice: no formal assessments of retention programs had been conducted to determine what works in local student retention and what does not work. The logistic regression results and subsequent evaluation provided valuable information that can be used by faculty and staff who are working to affect social change by enhancing student retention and persistence graduation.

Applications

The ultimate lesson learned from this research was that there are several evidenced-based opportunities to develop within the existing recruitment and retention strategies at the local campus, ranging from the initial contact with prospective students, throughout the matriculation process, and during their first year of enrollment. The evaluation template can be replicated with other campus programs or student support groups in order to identify additional student strengths and/or needs, which could lead to additional recommendations for recruitment, preparation, and support activities, and an even broader and far-reaching approach to the overall campus retention efforts.

Directions for Future Research

In addition, the inclusion of a qualitative review that would allow for the exploration of program content and answer questions pertaining to the causes of or approaches to addressing their individual retention issues, there are still numerous variations on the regression model that can, and most likely will, be add to this body of work. Adding any combination of interaction terms, the combined effect of two or more variables on an outcome variable, may help provide more specifics on the types of students who are the most prepared or the most at-risk. Some examples include:

1. The combined effect of ethnicity and financial need on retention;
2. The combined effect of ethnicity and housing status on retention;
3. The combined effect of ethnicity and premajor on retention;
4. The combined effect of gender and premajor on retention;
5. The combined effect of gender, housing, and premajor on retention.

These, and many more interaction terms could be entered in the model again to determine their effect on persistence as well.

Decisions trees are another option for classifying the vast amount of data available to the local campus stakeholders. Decision trees can be created quickly and are easy to understand, they can handle different types of variables, and would offer accurate classification when used with a date set as large as the one used in this study (Romero, Ventura, Pechenizkiy, & Baker, 2011). The current model is just the beginning; there are many opportunities for further research to support campus retention initiatives.

Conclusion

According to Bean's (2005) nine themes, there may be a correlation between satisfaction, integration and retention, but that correlation does not necessarily translate into an individual student's personal retention equation. The data analysis revealed that five of the nine themes and one of the interaction terms bear significant relationships to retention; FIG participation was not significant when controlling for additional themes. The quantitative results provided an assessment of retention and persistence outcomes and an inferential understanding of factors that impact retention at the local campus. The subsequent program evaluation advocated for the development of new recruitment and retention practices as well as the enhancement of existing approaches to the same.

One of the main ideas of Section 4 concerned including a qualitative narrative to the local FIG program evaluation, opening up the possibility of adding to the current research beyond the chosen quantitative method to gain insight to students' perceptions on academic and social integration. Still, a major strength of this project study is that it

does meet research goal of providing concrete data on the impact of the FIG on retention that the local campus can directly apply to current practices. Similarly, the project can be used to explore the impact of interaction terms, providing specific predictions for student retention and persistence. The FIG program evaluation provided a framework for future explorations that can be used by campus stakeholders who charged with and committed to efforts that affect social change through the development of responsible, productive, and prepared students.

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Appendix A: Evaluation Report

Executive Summary

This project study evaluation was initiated to provide the campus community with an understanding of the Freshman Interest Group (FIG) program's contribution to freshman retention. Several retention programs exist on the campus, but there are varying degrees of assessment and follow-through relating to program improvement. With no standardized method of delivering campus retention programs, the campus is left without an understanding of what any particular program contributes to freshman retention (Enrollment Management Group, personal communication, December 8, 2011).

Through access to decades of student demographic and educational data, a quantitative analysis of the FIG program was conducted to address a specific gap in local practice: no formal assessments of retention programs had been completed to determine what works in local student retention and what does not. The purpose of this evaluation was to provide a clear understanding of the degree to which FIG participation impacts retention, and to identify the type of students who would benefit most from participation in a learning community such as the FIG.

Bean's *Nine Themes of College Student Retention* (2005) provided the theoretical framework for this project, and served as a guide for collecting, organizing, and analyzing data to explain local student retention issues and identify the strengths of a FIG program that is assumed to have a positive effect on student retention. The overall findings showed that participation in the FIG increased the odds of retention by a factor of 1.37, and the odds of persistence by a factor of 1.74. Five of the nine themes were

shown to have a significant impact on the likelihood of retention. The FIG was not included in the prediction model, indicating that FIG participation did not increase the likelihood of retention at a significant level once those other factors were considered. Overall, the regression model successfully classified 87.1% of the study sample. The model proved to be an effective predictor of retention (98.8% accurate), but an ineffective predictor of non-retention (34.4% accurate). This warranted further exploration of the significant variables and characteristics of non-retained students in order to make recommendations to support and improve retention among those groups.

Introduction

Annually, over 4,700 students benefit from the resources and opportunities offered by a major research university system. While the campus has a long history of retention programming, no standardized method of evaluation or follow-through in support of program improvements exists. The purpose of a program evaluation is to specify information that will improve program outcomes; without conducting an assessment there can be no understanding of students' needs or services that are overlooked (Royse, Thyer, and Padgett, 2015). This rigorous quantitative analysis of the FIG program provided empirically derived support for the further development of campus retention efforts. It also provided a template that can be used to gather empirical data on other retention programs and present comparable evaluation data on all campus retention programs to campus stakeholders as directed by the Enrollment Management Group (Enrollment Management Group, personal communication, December 8, 2011).

Background

The FIG was a learning community model that linked cohorts of students with two or more courses and incorporated a peer mentoring component. Targeted toward first-year students with similar interests in potential majors, FIGs also provided a peer support system for entering students. Learning communities, FIGs included, are considered to be high-impact opportunities for students to engage, leading to greater levels of college success among program participants (Kuh, 2008; Pike, Kuh, & McCormick, 2011). Despite the amount of research on learning community types, settings, and student engagement impact, very little is known about the specific circumstances that promote the greatest benefits from participation (Pike, 2000), nor has research on the varying types of programs has shown a consistent impact on student retention (Strayhorn, 2009).

Evaluation data on program impact at the local level is needed in order to present realistic knowledge claims about the value of that program to its participants and to the institution (Loots, 2008). A previous evaluation of the FIG program data measured the academic and social integration and institutional satisfaction of students enrolled in FIGs. The effect that FIG participation had on retention and persistence was not measured at that time, but will help to inform the campus community regarding predictors of retention and how to better use resources and programs to reach the students most at-risk of dropping out (Reason, 2009).

This evaluation project was not intended as a report on the success or failure of the FIG program, but rather as a means of influencing future retention programming on

campus. The outcomes for this evaluation are students' retention and 5-year persistence to graduation rates, and the logistic regression analysis controlled for nine student characteristics that may be manipulated to improve retention, defined by Bean (2005) and described in Table A1:

Table A1

Nine Themes of College Student Retention

Theme	Definition
Intentions	Plans to return for the fall semester of the sophomore year
Institutional fit & commitment	Attitude about being a student and attachment to the college
Psychological processes & key attitudes	Expectations of success
Academics	Performance in courses taken
Social factors	Social connectedness and sources of social support
Bureaucratic factors	The role of campus offices; how information is formally exchanged
External environment	Factors beyond the control of the institution
Student's background	Strength of past performance and parental influence
Money & finance	Financial background

The campus strategic plan outlines a transformative strategy to lead a coordinated effort to retain more students from among targeted populations (M.Madigan, personal communication, October 1, 2014). In general, the retention efforts are to include: identifying and assisting at-risk students; providing early and frequent interventional advising; and incorporating resources from various academic and administrative units on campus. In addition to addressing the specific gap in local practice, this evaluation supports those directives by providing a clear understanding of the degree to which FIG participation impacts retention, and to identify the type of students who would benefit most from similar programming.

Methodology

Several institution-specific data sets were analyzed using quantitative methods to determine the overall effect of the FIG on student retention and persistence. The analysis used a logistic regression model, allowing for the inclusion of themes with underlying variables analyzed against a binary response variable (retained or not, persisted or not). Logistic regression enabled the odds ratio for each of Bean's (2005) nine themes (independent variables), retention, and persistence to graduation.

Two sample groups – FIG and no FIG – were analyzed to consider the following null hypotheses for this study:

HO_1: FIG participation does not increase the likelihood of retention.

HO_2: FIG participation does not increase the likelihood of persistence to graduation.

HO_3: The likelihood of retention is not changed by controlling for John Bean's nine themes of college student retention.

More specifically, the regression analysis was the statistical method used to answer following questions:

1. Does the likelihood of retention increase based on FIG participation?

HA_1: FIG participation does increase the likelihood of retention.

This was tested by analyzing the statistical results of the β_1 coefficient.

2. Does the likelihood of persistence to graduation increase based on FIG participation?

HA_2: FIG participation does increase the likelihood of persistence to graduation.

This was tested by analyzing the statistical results of the β_2 coefficient.

3. What is the likelihood of retention when controlling for John Bean's nine themes of college student retention?

HA_3: Controlling for the nine themes does increase the likelihood of retention.

This was tested by analyzing the statistical results of the $\beta_3 - \beta_{11}$ coefficients.

Sample

Since the five-year graduation rate at the local campus increases by an estimated 18.7% over the 4-year rate, a 5-year cohort was evaluated. The study sample included 1,346 FIG participants and 2,752 non participants from four cohorts: those who enrolled in the fall of 2006 through the fall of 2009. Eligible cohorts were the first cohort for whom available records contained all of the necessary variables, through the last cohort to have graduated in ten semesters at the time the date collection began in May 2015.

Eligible students for the retention outcome included those who started at the local campus and had no academic or curricular reason not to return for a second year. Eligible students for the persistence outcome included those whose intended major preference indicated that they planned to return to the local campus for their upper division years.

Data Collection and Coding

Raw data were collected through a series of Microsoft Access queries and imported into SPSS for non-experimental analysis. The data sets used, data storage location, and data collection methods are presented in Table A2.

Table A2

Measurement of the Predictors

Variable Name	Database/Table	Type	Description
β_1 – *Retention*			
Confirmed Registration for 3rd Semester	student/official	Categorical	Confirmed Registration (1 = *retained* 0 = *not retained*)
β_2 – *Persistence to Graduation*			
Graduated within 5 years	student/official	Categorical	Bachelor's Degree Approved (1 = *persistence* 0 = *nonpersistence*)
β_3 – *Intentions*			
Completed 2nd Semester	student/official	Categorical	Expected for 3rd Semester (1 = *yes*, 0 = *no*)

(table continues)

Variable Name	Database/Table	Type	Description
β4 - *Institutional Fit and Commitment*			
First Choice Campus	ugaapplic/applicants	Categorical	Local campus = 1st choice (1 = *yes*, 0 = *no*)
β5- *Psychological Processes and Key Attitudes*			
Expected Grades	dus/eps	Categorical	Student's estimated average after one year *(A, A-, B+, B, B-, C+, C)*
β6- *Academics*			
Year 1 GPA	student/semester	Ratio	First year GPA (0-4.0)
			Other Campus Housing Off-Campus
β8 - *Bureaucratic Factors*			
Academic Home	student/semester	Categorical	Premajor Area *BUS, ENG, HSS, SCN, DUS*

(table continues)

Variable Name	Database/Table	Type	Description
β_7 - *Social Factors*			
Housing Status	student/housing	Categorical	First-year housing location *Residence Hall A* *Residence Hall S* *Residence Hall L* *Residence Hall N* *Residence Hall P*
β_9 - *External Environment*			
Student Indicator	student/bio	Categorical	Student's Ethnicity
β_{10} - *Student's Background*			
Enrollment Index	ugaapplic/applicants	Ratio	Institution's prediction of student's first year GPA *0-4.0, non-science PGPA*
β_{11} - *Money and Finance*			
Need Index	Institutional Research Committee	Ratio	Level of financial need *0-100*

Results

The interpretation of the logistic coefficient is interpreted as the odds of an event occurring, and defined as the ratio of probabilities, namely the probability that an event will occur versus the probability that it will not. Factors greater than one indicate an increase in those odds, and factors less than one indicate a decrease (SPSS, 2004).

Q1 – Does the likelihood of retention increase based on FIG participation?

The model demonstrates that FIG participation bears a statistically significant relationship to retention, increasing the odds of retention by a factor of 1.37. However, the present model also reveals that even though FIG participation bears a statistically significant relationship to retention, it shows little difference between the retention of FIG participants versus non-FIG participants (84.8% vs 80.4%).

Q2 – Does the likelihood of persistence to graduation increase based on FIG participation?

The model demonstrates that that FIG participation also bears a statistically significant relationship to persistence, better than that of retention (odds=1.37), increasing the odds of persistence by an even greater factor of 1.74. The retention and persistence outcomes are presented in Figures 1and 2, and are disaggregated by FIG participation. FIG participation had a greater effect on persistence, with 75% persisting to graduation vs 63.4% in the non-FIG group. Table A3 represents the results for research questions one and two.

Table A3

Impact of FIG Participation

Outcome	β	Wald Statistic	*P*	Odds ratio
Retention	.312	12.071	.001	1.37
Persistence	.552	55.129	.000	1.74

Q3 – What is the likelihood of retention when controlling for John Bean's nine themes of college student retention?

The FIG was not included in the prediction model, indicating that FIG did not increase the likelihood of retention at a significant level once those other factors were considered. The combined effect of campus choice * the intent to leave was the only interaction term that met the criterion for inclusion in the logistic regression model.

Of the nine independent variables available to the regression solution, only five bear a statistically significant relationship to the prediction of retention: student's plans to return, the first-year GPA, housing, premajor, and ethnicity. The logistic regression showed that student intentions and first-year GPA were strong predictors of retention, with *p*-value of .000 for both variables. While these results were expected, it is important to remember Pascarella's (1984) causal model which emphasized that an individual student's expectations, persistence, and ultimately retention is influenced by a combination of external factors. Table A4 summarized the regression results.

Table A4

Logistic Regression of Student Retention

Variable		β	Wald Statistic	*p*	Odds ratio
Intentions		-3.313	167.680	.000	.04
First-Year GPA		1.045	260.727	.000	2.84
Housing			13.112	0.041	
	Freshman Honors	.598	3.024	.082	1.82
	Freshman Suites	.366	4.323	.038	1.44
	Freshman Dorm (L)	.089	.389	.533	1.09
	Freshman Dorm (N)	.065	.219	.640	1.07
	Freshman Dorm (P)	.086	.365	.546	1.09
	Other Campus Housing	-.981	5.200	.023	.37
PreMajor			27.968	.000	
	Business	.234	2.199	.138	1.26
	Engineering	.365	7.343	.007	1.44
	H&SS	-.282	3.783	.052	.75
	Science	-.263	2.973	.085	.77
Ethnicity			24.284	.001	
	Native American	-1.511	2.493	.114	.22
	Hispanic	-.201	.322	.570	.81
	Asian	.740	2.981	.084	2.10
	Hawaiian	20.799	.000	1.000	n/a
	White	-.171	.633	.426	.84
	Foreign	2.383	7.673	.006	10.84
	No Response	0.765	3.801	.051	2.14
First Choice Campus*Intentions		-1.083	4.098	.043	.34

As general categories, students' housing status, premajor, and ethnicity were significant predictors of retention at the local campus, with *p*-values of .041, .000, and .001, respectively. An examination of the contrasts shown under each of these significant variables provided information that will aid in the identification of students who are the least likely to be retained, and informed the recommendations for retention programming, including the development of specific learning community options for targeted groups. The reference categories were determined by examining the descriptive statistics, and represent the subgroup within that variable least like to be retained and/or persist to graduation.

Housing revealed six contrasts evaluated against the reference category of off-campus housing. FIG housing (freshmen suites) increased the odds of retention by a factor of 1.44, and other campus housing (for non-freshmen) decreased the odds of retention by a factor of .37. Relative to living off campus, none of the other on campus housing options increased retention at a significant level.

Premajor contrasts were evaluated against the reference category of the Division of Undergraduate Studies (DUS). Relative to students enrolled in DUS, the business and science premajors did not have a significant impact on retention. Students' odds of being retained increased by a factor of 1.44 for engineering premajor students, and decreased for a factor of .75 for H&SS premajor students, compared to those in DUS.

Ethnicity yielded seven contrasts evaluated against the reference category of African American students. Only foreign students and those who did not disclose their ethnicity demonstrated significant impact on retention. Foreign students' odds of being

retained increase by a factor of 10.84, and non-disclosed students by a factor of 2.14 over African American students.

Six recommendation categories were developed, based on the factors included in the prediction model. Retention and persistence outcomes, disaggregated by FIG participation, gender, housing status, premajor, and ethnicity highlighted the groups at risk of not being retained. Target groups were identified through an analysis of the outcomes presented in Table A5.

Table A5

Retention and Persistence Outcomes

N	% retained	% not retained	COMPARISON VARIABLE	% persist	% non persist
			PARTICIPATION		
1346	84.8	15.2	FIG	75.0	25.0
2752	80.4	19.6	No FIG	63.4	36.6
			GENDER		
2561	81.9	18.1	Male	66.7	33.3
1537	81.8	18.2	Female	68.1	31.9
			HOUSING		
221	94.6	5.4	Freshman Honors	89.1	10.9
557	88.2	11.8	Freshman Suites	79.3	20.7
727	82.0	18	Freshman Dorm (L)	68.2	31.8
789	82.3	17.7	Freshman Dorm (N)	68.4	31.6
726	82.1	17.9	Freshman Dorm (P)	70.4	29.6
38	68.4	31.6	Other Housing	57.9	42.1

(table continues)

N	% retained	% not retained	COMPARISON VARIABLE	% persist	% non persist
			PREMAJOR		
711	86.2	13.8	Business	73.6	26.4
1184	85.9	14.1	Engineering	71.5	28.5
651	77.9	22.1	H&SS	64.7	35.3
544	96.3	3.7	Science	67.8	32.2
1008	78.7	21.3	DUS	58.9	41.1
			ETHNICITY		
5	60.0	40.0	Native American	60.0	40.0
87	74.7	25.3	Hispanic	52.3	47.7
110	87.3	12.7	Asian	63.3	36.7
1	100	0.0	Hawaiian	0.0	100
3529	81.9	18.1	White	68.8	31.2
67	97.0	3.0	Foreign	76.1	23.9
135	89.6	10.4	No Response	64.4	35.6
164	68.9	31.1	Black	42.0	58.0

Recommendations

In his text, *Leaving College*, (1987, 1993) Tinto proposed six Principles of Institutional Action necessary to form a strategic action plan for retention:

1. Institutions should ensure that new students enter with or have the opportunity to acquire the skills needed for academic success;

2. Institutions should reach out to make personal contact with students beyond the formal domains of academic life;

3. Institutional retention actions should be systematic in character;

4. Institutions should start as early as possible to retain students;

5. The primary commitment of institutions should be to their students;

6. Education, not retention, should be the goal of institutional retention programs. (p. 138-140)

Grills, Fingerhut, Thadani and Machón (2012) presented several goals for learning community participants. Students should:

- feel a sense of community, bonding, and engagement to peers, faculty, the broader educational community, and the field of psychology;
- feel supported by peers, faculty, and the broader university community;
- feel a sense of engagement in class;
- take responsibility for their own learning and that of their peers;
- use collaboration and teaming strategies to enhance their educational potential;
- value opportunities for exploration and value intellectual pursuits in higher education;
- demonstrate greater awareness of available resources at the university and greater knowledge of how to access them;
- demonstrate improved academic outcomes, as evidenced by GPA in both their major and LMU's core courses and through higher retention rates. (p. 47)

The following six recommendation categories, tailored to the characteristics of the most at-risk students, aim to meet those institutional principles and program goals through the action steps outlined below.

1. Recommendations Pertaining to Students' Intentions and Campus Choice

Erickson and Stone (2012) argued that in order enhance students' intent to persist, their intent must be determined before enrollment. The combined significance of student's campus preference to their premajor informs the recommendations pertaining to understanding and addressing institutional commitment and intention issues, as encouraged by (Davidson, Beck & Grisaffe, 2015; Shaw & Kobrin, 2011; Thomas, 2014).

Outreach to Prospective Students.

- Enrollment management personnel should provide data on accepted and committed students to the appropriate school directors for outreach prior to enrollment.
- School directors or their designated representative(s) should work with the Office of Strategic Communications to develop materials to distribute, by premajor, to students who do not indicate the preference to complete their upper division years at the local campus. Multiple contacts during the pre-matriculation stage should provide prospective students with information on majors offered locally, the local faculty-student ratio, local internship and research opportunities, and cost savings.

- Schools should provide opportunities for prospective students to participate in engagement activities with current upper division students to foster a connection to the local campus.

Outreach to Current Students.

- Students should be invited to major exploration events coordinated by various curriculum department events during their first semester of enrollment.
- Academic departments should maintain contact lists of students, by premajor, to distribute information on major options and required courses, and to connect undecided students to upper division students for mentorship experiences.
- Academic departments should work with enrollment management and strategic communications personnel to develop messaging to parents regarding the benefits of completing a degree at the local campus.

2. Recommendations Pertaining to Students GPA

While the first-year GPA was a significant variable in the regression model, waiting until the end of the first year to implement retention efforts will not have a meaningful impact on retention. Early warnings, faculty referrals, and the first semester GPA inform the recommendations intended to support higher first-year GPAs.

Outreach to Prospective Students.

- Enrollment management and strategic communications personnel should produce a series of outreach materials to inform incoming students of the

impact of a strong first semester GPA, including the impact that grades have on employment opportunities, and the academic services available to students in need of support.

Outreach to Current Students.

- The retention office should use early progress reports, faculty referrals, and advising flags to identify students who are not on track for a successful first-semester GPA. Contact should be made via email, phone, and postal mail, to encourage students to access support services on campus.

The retention office should collaborate with school department chairs to involve appropriate personnel in remediation outreach efforts.

3. Recommendations Pertaining to Campus Housing Status

Students' living environment contributes to the institutional climate and peer experiences in college (Tinto, 1987; Lasky & Hetzel, 2011; Gajewski & Mather, 2015). The following recommendations intend to support students according to their housing status.

Outreach to Prospective Students.

- Enrollment management, residence life, and strategic communications personnel should produce a series of outreach materials to inform incoming students of their housing options. The retention office should target students who indicate an off-campus housing option for further

outreach to inform them of the importance of connecting the campus by engaging with faculty and peers.

Outreach to Current Students.

- The retention office should collaborate with student activities and academic department personnel to coordinate regular activities designed specifically for off-campus students to connect with peers and faculty. The retention office should perform regular outreach via email, phone, and postal mail to encourage off-campus students to use campus support services and participate in the above engagement activities.

4. Recommendations Pertaining to Students' Premajor

Retention rates vary considerably by course of study, and a clear understanding of academic program content and expectations play a role in student success (Harvey & Luckman, 2014; Nelson & Creagh, 2013). Upon examination of retention by school of enrollment and/or specific majors the local campus should allocate resources and personnel to the areas the will benefit most from curriculum-based learning communities (Coates, 2014; Davis, Burgher, & Jefferson, 2013). The following recommendations intend to support undecided students and those in low preference majors with a decreased likelihood of retention.

Outreach to Prospective Students.

- Enrollment management, academic advising, and academic department should work with strategic communications personnel to produce a series of outreach materials for applicants and committed student in the DUS and

H&SS premajors. Themes should include opportunities to explore major and career options prior to enrollment, as well as employment information for past DUS and H&SS graduates.

- Schools should provide opportunities for prospective students to participate in engagement activities with current upper division students who entered the university in the DUS and H&SS premajors.

Outreach to Current Students.

- The retention office should provide information on DUS and H&SS students to the appropriate academic departments in order to develop connections to students.
- Academic departments should maintain contact lists of students in the DUS premajor to distribute information on major options and required courses, and to connect undecided students to upper division students for mentorship experiences.
- Academic departments should work with enrollment management and strategic communications personnel to develop messaging to parents regarding the benefits of major and career exploration, and employment information for past DUS and H&SS graduates.

5. Recommendations Pertaining to Students' Ethnicity

The variation in needs, cultures, and support systems among different ethnic groups requires a comprehensive approach to addressing their transitional issues (Flores & Park, 2013; Johnson, 2013; Stewart, Lim & Kim, 2015). Therefore, the premajor and

housing status recommendations above should be repeated, separately, for African American and Hispanic students in an attempt provide them with specific and comprehensive outreach and support.

6. Recommendations Pertaining to an Interconnection of Factors

Although the program was discontinued, results show that the FIG did have a positive impact on retention and persistence: odds of being retained were 1.37 and 1.74, respectively. Additionally, the contrasts under the significant factors of housing status, premajor, and ethnicity indicate that the development of specific learning community options for targeted groups should be considered. Therefore, the Enrollment Management Group is would be well-advised to consider new learning community options for the following groups.

- Within each residence hall, establish learning communities by premajor.
- Within each premajor, establish learning communities by ethnicity.
- Establish learning communities for off-campus students, by major and ethnicity.

Conclusion

Implication from this project study and the subsequent FIG program evaluation suggest that comprehensive services and outreach at the local campus will improve student retention and persistence to graduation. While the findings are limited by the absence of qualitative inductions, the study results and recommendations attempt to mitigate that limitation through an examination of external factors that can be measured using a large sample of existing data. This evaluation may serve as a template to help the campus community review outcomes and design approaches to affect future outcomes. In

the future, a more robust evaluation could include qualitative data, but the chosen method provided adequate and ample results to inform the recommendations for campus retention efforts. Retention is a shared institutional concern that is closely tied to the strategic plans and mission of the local campus. This project is a step in the direction of regular, comprehensive and on-going retention data collection and analysis at a campus that is increasingly charged with implementing retention efforts that improve the campus climate and overall student success.

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Appendix B: Data Use Agreement

DATA USE AGREEMENT

This Data Use Agreement ("Agreement"), effective as of February 23, 2015 ("Effective Date"), is entered into by and between Faith C. Graham ("Data Recipient") and Penn State Erie, The Behrend College ("Data Provider"). The purpose of this Agreement is to provide Data Recipient with access to a Limited Data Set ("LDS") for use in research **in accord with laws and regulations of the governing bodies associated with the Data Provider, Data Recipient, and Data Recipient's educational program.** In the case of a discrepancy among laws, the agreement shall follow whichever law is more strict.

1. Definitions. Due to the study's affiliation with Laureate, a USA-based company, unless otherwise specified in this Agreement, all capitalized terms used in this Agreement not otherwise defined have the meaning established for purposes of the USA "HIPAA Regulations" and/or "FERPA Regulations" codified in the United States Code of Federal Regulations, as amended from time to time.

2. Preparation of the LDS. Data Provider shall prepare and furnish to Data Recipient a LDS in accord with any applicable laws and regulations of the governing bodies associated with the Data Provider, Data Recipient, and Data Recipient's educational program.

3. Data Fields in the LDS. **No direct identifiers such as names may be included in the Limited Data Set (LDS).** In preparing the LDS, Data Provider shall include the **data fields specified as follows**, which are the minimum necessary to accomplish the research: ethnicity, gender, adult indicator, veteran indicator, EOP indicator, SAT scores, and high school GPA, home address, citizenship, enrollment index, need index, campus preference, Educational Planning Survey responses, intended major, registration status, registration date, first-year housing address, first-year GPA, academic advisor information, fraternity/sorority membership, freshman interest group participation, and graduation approval date.

4. Responsibilities of Data Recipient. Data Recipient agrees to:

    a. Use or disclose the LDS only as permitted by this Agreement or as required by law;

    b. Use appropriate safeguards to prevent use or disclosure of the LDS other than as permitted by this Agreement or required by law;

    c. Report to Data Provider any use or disclosure of the LDS of which it becomes aware that is not permitted by this Agreement or required by law;

d. Require any of its subcontractors or agents that receive or have access to the LDS to agree to the same restrictions and conditions on the use and/or disclosure of the LDS that apply to Data Recipient under this Agreement; and

e. Not use the information in the LDS to identify or contact the individuals who are data subjects.

5. Permitted Uses and Disclosures of the LDS. Data Recipient may use and/or disclose the LDS **for its Research activities only.**

6. Term and Termination.

a. Term. The term of this Agreement shall commence as of the Effective Date and shall continue for so long as Data Recipient retains the LDS, unless sooner terminated as set forth in this Agreement.

b. Termination by Data Recipient. Data Recipient may terminate this agreement at any time by notifying the Data Provider and returning or destroying the LDS.

c. Termination by Data Provider. Data Provider may terminate this agreement at any time by providing thirty (30) days prior written notice to Data Recipient.

d. For Breach. Data Provider shall provide written notice to Data Recipient within ten (10) days of any determination that Data Recipient has breached a material term of this Agreement. Data Provider shall afford Data Recipient an opportunity to cure said alleged material breach upon mutually agreeable terms. Failure to agree on mutually agreeable terms for cure within thirty (30) days shall be grounds for the immediate termination of this Agreement by Data Provider.

e. Effect of Termination. Sections 1, 4, 5, 6(e) and 7 of this Agreement shall survive any termination of this Agreement under subsections c or d.

7. Miscellaneous.

a. Change in Law. The parties agree to negotiate in good faith to amend this Agreement to comport with changes in federal law that materially alter either or both parties' obligations under this Agreement. Provided however, that if the parties are unable to agree to mutually acceptable amendment(s) by the compliance date of the change in applicable law or

regulations, either Party may terminate this Agreement as provided in section 6.

b. Construction of Terms. The terms of this Agreement shall be construed to give effect to applicable federal interpretative guidance regarding the HIPAA Regulations.

c. No Third Party Beneficiaries. Nothing in this Agreement shall confer upon any person other than the parties and their respective successors or assigns, any rights, remedies, obligations, or liabilities whatsoever.

d. Counterparts. This Agreement may be executed in one or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

e. Headings. The headings and other captions in this Agreement are for convenience and reference only and shall not be used in interpreting, construing or enforcing any of the provisions of this Agreement.

IN WITNESS WHEREOF, each of the undersigned has caused this Agreement to be duly executed in its name and on its behalf.

DATA PROVIDER

Signed:

Print Name: Jane Brady
Print Title: Campus Registrar & Data Steward

DATA RECIPIENT

Signed:

Print Name: Faith C. Graham
Print Title: Retention Coordinator

Appendix C: Letter of Cooperation

Date: July 31, 2014

From: The Office for Research Protections - FWA#: FWA00001534
Tracie L. Kahler, Compliance Coordinator

To: Faith C. Graham

Re: Determination of Exemption

IRB Protocol ID: 45849

Follow-up Date: July 30, 2019

Title of Protocol: Evaluation of Freshman Interest Groups as Retention Programs

The Office for Research Protections (ORP) has received and reviewed the above referenced eSubmission application. It has been determined that your research is exempt from IRB initial and ongoing review, as currently described in the application. You may begin your research. The category within the federal regulations under which your research is exempt is:

45 CFR 46.101(b)(4) Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects.

Given that the IRB is not involved in the initial and ongoing review of this research, it is the investigator's responsibility to review IRB Policy III "Exempt Review Process and Determination" which outlines:

- What it means to be exempt and how determinations are made
- What changes to the research protocol are and are not required to be reported to the ORP
- Ongoing actions post-exemption determination including addressing problems and complaints, reporting closed research to the ORP and research audits
- What occurs at the time of follow-up

Please do not hesitate to contact the Office for Research Protections (ORP) if you have any questions or concerns. Thank you for your continued efforts in protecting human participants in research.

This correspondence should be maintained with your research records.

Appendix D: Ohio State University Press Permission

From: Rebecca Sullivan
To: FAITH C GRAHAM
Subject: Re: permission to reprint figure
Date: Wednesday, March 18, 2015 8:37:28 AM

Dear Ms. Graham,

We can certainly process your request via email. I apologize for the lack of clarity regarding permissions on our current website. We are in the process of moving to an entirely new (updated) website that will hopefully be more user friendly.

Please correct me if I'm wrong, but what I understand from your request is that you wish to use this image in your Ed.D dissertation. If that is the case, we will forego the usual fee charged for reproducing an image and grant you non-exclusive permission to include it in your dissertation. We would ask that you cite *The Journal of Higher of Education* as the original source and The Ohio State University Press as the original publisher. If, in the future, the dissertation (including the image) is formally published, we would appreciate if you would contact us again regarding permission to use it.

If you have any questions or concerns, please let me know.

Best,

Rebecca Sullivan
rebecca@osupress.org
614-292-6376

On Tue, Mar 17, 2015 at 9:11 AM, FAITH C GRAHAM <fcg10@psu.edu>

wrote:

Good morning,

I'm writing to request permission to use the figure titled "General Causal Model to Explain Educational Aspirations after Two Years of College" found on page 755 in the following journal:

Pascarella, E. T. (1984). College environmental influences on students' educational aspirations. *Journal of Higher Education, 55*(6), 751-777. Retrieved from http://www.jstor.org/stable/1981512

I'm pursuing an Ed. D in Administrator Leadership at Walden University. My research involves our local Freshmen Interest Group (FIG) program, which is thought to contribute to positive retention and persistence outcomes. However, the FIG program has not been formally evaluated to determine its contribution to these outcomes. I would like to include this figure in the section of my literature review that focuses on understanding the issue of college retention. The online permission instructions weren't clear, so I hope you can process my request via email. Please free to contact me if you need further clarification. I appreciate your time and look forward to your response.

Sincerely,

Faith C. Graham

Faith C. Graham
RetentionCoordinator
Penn State Erie, The Behrend College
4851 College Drive, Erie, PA 16563

Appendix E: Cengage Learning, Inc. Permission

IP Granting Dept
500 Terry A Francois Blvd, 2nd Floor, San Francisco, CA 94158 Phone: 800-730-2214 Fax: 800-730-2215
Email: permissionrequest@cengage.com

Submit all requests online at www.cengage.com/permissions.

11/11/2016 Request # **351232**

Faith C Graham
Penn State Erie, The Behrend College Retention
4851 College Drive
Erie, PA 16365

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Total pages:	1		

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Sincerely,
Sheila Harris
Rights and Permissions Editor

Appendix F: Coding Schema

Cohort Demographics

PSU ID	Cohort	Gender	Adult	1st Sem GPA
Unique 9-digit #	1=FA06 2=FA07 3=FA08 4=FA09	0=Female 1=Male	0=no 1=yes	ratio

Retention	Local Campus Graduate	Bachelor's Degree	Bachelor's in 5yrs or less	Major
0=no 1=yes	1=yes 2=no 3=Missing	0=no 1=yes	0=no 1=yes	1=Business 2=Engineering 3=Humanities & Social Sciences 4=Science

Residency Status	Citizenship
1=PA 2=NonPA 3=ImmigrantPA 4=ImmigrantNonPA 5=Foreign	1=US Citizen 2=Permanent Resident 3=Foreign Students

Father's Education	Mother's Education
1=Graduate Degree 2=Bachelor's + 3=Bachelor's 4=High School + 5=High School 6=Less than High School 7=Not Applicable 8=No Response 9=Missing	1=Graduate Degree 2=Bachelor's + 3=Bachelor's 4=High School + 5=High School 6=Less than High School 7=Not Applicable 8=No Response 9=Missing

Logistic Regression Variables

βn-FIG	βn-Intentions	βn-1st Choice Campus	βn-Expected Grades
0=no 1=yes	0=no 1=yes	0=no 1=yes	1=A 2=A- 3=B+ 4=B 5=B- 6=C+ 7=C 8=No Response

βn-1st Yr Cum GPA	βn-Housing	βn-PreMajor
ratio	1=Freshman Honors (A) 2=Freshman Suites (S) 3=Freshman Dorm (L) 4=Freshman Dorm (N) 5=Freshman Dorm (P) 6= Other Campus Housing 7=Off-Campus	1=Business 2=Engineering 3=Humanities & Social Sciences 4=Science 5=Division of Undergraduate Studies

βn-Ethnicity	βn-EI Score	βn-Financial Need
1= Am Indian/Native Alaskan 2=Black 3=Asian 4=Hawaiian 5=No Data 6=White 7=Foreign 8=No Response 9=Hispanic	ratio	ratio 0=zero need 100=highest need