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# The impact of learning community enrollment on first-generation students' first-year academic achievement and retention rates

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**The impact of learning community enrollment on first-generation students'  
first-year academic achievement and retention rates**

**by**

**Kurt Martenae Earnest**

**A dissertation submitted to the graduate faculty  
in partial fulfillment of the requirement for the degree of**

**DOCTOR OF PHILOSOPHY**

**Major: Education (Higher Education)**

**Program of Study Committee:  
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**Iowa State University**

**Ames, Iowa**

**2002**

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has met the dissertation requirements of Iowa State University**

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## CHAPTER 1. INTRODUCTION

Over the last 25 years, the value of a college degree has increased greatly. The National Center for Education Statistics (NCES, 1998) noted that in 1972 males aged 25-34 who possessed bachelors' degrees earned 19 percent more than their counterparts who attained only a high school diploma. By 1995, males with bachelors' degrees earned 52 percent more. These statistics support the contention that innovations in technology and the demands of the current work environment have shifted our economic focus drastically and require that today's workers be skilled, thoughtful, critical thinkers, and adept communicators (NCES, 1998). Preparing such workers and citizens may necessitate retooling our higher educational system. A report from the Mathematical Sciences Education Board (1990, p. 4) stated that jobs requiring mathematical skill are growing at nearly double the rate of overall employment. Carnevale (1991) suggested that the decline in the mass production-based economy and shift to an information-based society have eliminated the jobs that require low skills but pay high wages.

When we examine these two trends, we observe that the higher-paying jobs that sustain our economy and provide workers with salaries that can support families are peopled by individuals who possess higher-order thinking skills. Equipping workers with the cognitive tools necessary for success in our technology-driven work environment will require that we educate all students at a level far above our current practice (Rendon & Hope, 1996). The rationale for rethinking our methods and approaches to education becomes even more pressing when we look at the changing face of the American public, and specifically the university population.

Manuel Justiz (1994) reported that our youthful population is drawn increasingly from non-white groups. Historically, less lofty educational standards have been set for members of this population, but as Rendon and Hope (1996, p. 28) commented, "ethnic and racial minorities are America's future. America cannot succeed without them." The U. S. Department of Education has stated that the number of minority students enrolled in U. S. colleges increased by 4.5 per cent in 1994. Since 1976, minority enrollment has doubled to 3,396,000, and, based on data collected in 1994, minority students compose 24 percent of college students (Gose, 1995). Based on changing demographics, it appears that universities can expect to educate more minority students in the future (Brown, 1986). Such statistics alert administrators to the fact that they can no longer discuss educational reform without considering the issues that surround racial and ethnic minorities.

Furthermore, several scholars have indicated that for the very next decade institutions of higher learning can expect to see steady increases in the number of students from first-generation family backgrounds (Rendon, 1994; Terenzini, Nora, Pascarella, Springer, & Yaeger, 1996). Not surprisingly, many of the students classified as first-generation come from minority homes. Although few schools keep precise enrollment statistics on first-generation students, there is general agreement the numbers of these students are growing, as more technical jobs require a college degree and as ethnic minorities, especially those of Hispanic heritage, enter institutions of higher learning in greater numbers (NCES, 1998).

#### First-Generation Defined

Terenzini and associates (1996) noted that relatively little research has been conducted on students who are the first in their families to attend colleges and universities

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(i.e. first-generation students). However, the information that is available suggests such students may face unique challenges. First-generation students often have family background characteristics that are associated with risk for attrition. For instance, they are more likely to originate from lower-income families, and often have lower achievement scores and lower overall degree aspirations (NCES, 1998). Though all students must adapt to a new set of academic and social values when they enroll in a university or college, the adaptation process of first-generation students often is far more difficult. For example, advice and information on postsecondary education, as well as social support, that might be transferred from parents who went to a university or college may be unavailable (York-Anderson & Bowman, 1991). Also, first-generation students may find it difficult to balance the expectations of families and friends with the educational demands required for the successful completion of college and university degrees (London, 1989; Terenzini et al., 1994). Furthermore, after arriving on campus, it is not uncommon for this population to experience lower levels of academic and social integration (Billson, & Brooks-Terry, 1982). Difficulty reconciling the cultural divisions that exist between the university environment and the pre-college environment often results in stopping out and dropping out (Tinto, 1975). A myriad of studies indicate the potential retention issues that result when students fail to make positive academic and social connections (Braxton, Sullivan, & Johnson 1997; Pantages & Creedon, 1978; Pascarella & Terenzini, 1977; 1991; Tinto, 1975, 1987, 1994). For institutions to better understand the unique needs of first-generation students, more must be known about who they are and their college enrollment experiences.

One of the foremost retention researchers, Vincent Tinto (1994), noted that of the nearly 2.4 million students newly-enrolled in institutions of higher learning each year, 1.5 million will leave their first institution without receiving a degree. Of those, approximately 1.1 million will leave higher education altogether without completing a two-year or four-year degree program. These data clearly present a challenge to university administrators. The situation for administrators is exacerbated further when the retention rates of first-generation students are explored. The initial finding of the NCES (1998) was that first-generation students are much less likely than their non-first-generation counterparts to either have attained a degree or to be enrolled in post-secondary education five years after their initial enrollment. When differences in persistence and attainment were examined according to institutional type, the results held for students who began at public 4-year and private not-for-profit 4-year institutions. First-generation students from both types of four-year institutions were less likely to have persisted overall than their non-first-generation counterparts. After five years, 34 percent of first-generation students from public 4-year institutions had no degree and no longer were enrolled, compared to 23 percent of their non-first-generation counterparts attending public 4-year institutions.

### Student Departure

Several theories have attempted to explain the phenomenon of student departure from institutions of higher learning. As early as 1962, Summerskill sought to explain student departure using psychological models. His work and that of Marks (1967) suggested that individual attributes, dispositions, and personalities influence the ability of students to meet the academic demands of an institution. Their work and that of others (Elton & Rose, 1966;

Ethington, 1990; Heilbrun, 1965) share a common thread that retention and departure are a direct result of an individual's ability or willingness to complete the tasks necessary to remain in college.

At the other end of the continuum are environmental theories that emphasize the role of social, organizational, and economic forces. Conflict theorists such as Karabel (1972) and Pincus (1980) argue that educational institutions are structured to serve the interests of prevailing societal and educational elites. In their opinion student departure must be viewed and understood not as an isolated event but in the context of broader social inequity.

In the last three decades, interactionist theories of student departure have received the most attention. Prominent among these is Tinto's (1975, 1987, 1993) interactionist model. By late 1994 there were more than 400 citations of the model, and approximately 170 dissertations were based on it by early 1995 (Braxton, Sullivan, Johnson, 1997).

Tinto (1975) presented an institutionally-oriented model that generated new insights into the social processes involved in student attrition. In addition, Tinto's study identified a need for a conceptual frame that could help explain the processes that lead to student attrition (Pantages & Creedon, 1978). Tinto (1975) posited that students enter college with various individual characteristics. Among these would be family background, characteristics that Tinto delineated into family socioeconomic status, parental educational level, and parental expectations. Examples of individual attributes include academic ability, race, and gender. Pre-college schooling experiences included such variables as high school GPA and ACT scores. Tinto and others hypothesized that these characteristics directly influence students' departure decisions as well as students' initial commitments to the institution and to the goal

of graduation. "Initial commitment to the institution and commitment to the goal of graduation both affect the level of a student's integration into the academic and social systems of the college or institution" (Braxton, et al. 1990, p. 32). The premise of the interactionist model suggests that students bring certain characteristics with them to college. When students arrive on college campuses, they interact or fail to interact with the academic and social dimensions of the institution. Failure to interact in a positive way greatly influences departure decisions (Astin, 1984; Pantages & Creedon, 1978; Pascarella & Terenzini, 1991; Tinto, 1987).

As university administrators begin to face the challenge of changing student demographics, they also face the challenges of closer scrutiny about use of public dollars, dwindling confidence in the education system, and constant concerns for accountability, continuous quality improvement, and retention. In 1993, the Wingspread Group, a blue-ribbon task force, echoed this challenge and called upon the "many constituencies within the higher education community to rethink priorities while studying the complex political and societal forces that bear on their institutions" (p. 3). Universities have responded to this report and others by engaging in conversations and innovative practices directed at transforming institutions of learning.

### Learning Communities

One curricular reform that has generated a great deal of interest is the learning community movement. Gabelnick and his colleagues (1990) defined a learning community as:

Any one of a variety of curricular structures that link together several existing courses or actually restructure the material



entirely so that students have opportunities for deeper understanding and integration of the material they are learning and more interaction with one another and their teachers as fellow participants in the learning enterprise. (Gabelnick, MacGregor, Matthews, & Smith, 1990, p. 19)

In their work, *Learning Communities: Creating Connections Among Students, Faculty and Disciplines*, Gabelnick et al. (1990) traced the learning community phenomena and defined several learning community models. In linked courses models, cohorts of students enroll in two or more courses, typically a skills course and a content course. In cluster models, cohorts of students enroll in two, three, or four discrete courses, linked by a common theme. Gabelnick et al. noted that Freshmen Interest Groups (FIGs) are especially popular on larger campuses because they do not require that administrators reduce class sizes. They attempt to make the larger university smaller by enrolling cohorts of students in three or more linked classes. FIG students participate in larger classes but they share a connection with a cohort of students with whom they share a set of common classes. In most cases FIGs also utilize peer assistants: that is, upper class students who conduct weekly seminars with cohorts of 20-30 first-year students designed to help them synthesize the learning that has occurred in the linked courses. Though learning community models vary across institutions and are defined liberally, learning communities typically possess the following characteristics: 1) Students are organized into small groups. 2) Students are aided in establishing academic and social networks. 3) Students and faculty focus on learning outcomes. 4) Students are provided with a setting where they can be socialized to the expectations of college (Shapiro & Levine, 1999).

### **Problem and Purpose**

As public pressure increases for colleges and universities to reconcile the mismatch which currently exists between what American society needs from higher education and what it is receiving, institutions of higher learning are looking within to determine the factors that promote student success and to use this information to develop curricular reforms that will allow higher education institutions to meet the needs of an increasingly diverse student population and the demands of an increasingly dissatisfied and frugal public. This study explores the degree to which learning community involvement influences the retention and academic achievement of first-generation students in their first year of college at a land grant institution.

London's (1989) findings suggested that for first-generation students, college attendance was not necessarily a part of their family's tradition or expectations. On the contrary, those who were the first in their immediate family to attend college were breaking, not continuing, family traditions, and as a result these students often faced multiple transitions - academic, social, and cultural. A broad body of research has addressed the question of student persistence, but there is limited information on the degree to which first-generation status impacts the retention rates of first-generation students (Billson & Terry 1982; Terenzini et al., 1996). Tinto and others advanced a theory that helps to explain the process of student departure. Tinto and others have also provided a clearer picture of which factors influence persistence (Pantages & Creedon, 1978; Tinto, 1987; Tracey & Sedlacek, 1985). This study builds upon that knowledge and contributes by paying special attention to a curricular reform designed to increase student involvement and examining how that

curricular reform impacts retention rates and academic achievement of first-generation students.

Bandura (1986) reported that students typically enter colleges with various characteristics and pre-college experiences, and that these characteristics interact with those of the institution to create certain behaviors and attitudes. The work of London (1989), and Pascarella and Terenzi (1991) suggests that first-generation students may be particularly vulnerable to influences that reduce their retention rates. This study will use the CIRP Freshmen Interest Survey and the Office of the Registrar's records to examine the impact of learning community enrollment on first-generation students' GPAs and retention rates. These subjects are cohorts of students who enrolled in Iowa State in the fall 1999 and fall 2000.

### **Significance of the Study**

In 1998 the president of Iowa State University, Martin Jischke, allocated 1.5 million dollars to be used to promote the growth and development of learning communities on campus. The money was distributed at a rate of 500,000 dollars a year. This administrative support fostered the growth of learning communities on campus. From 1997-2000 the number of students participating in learning communities rose from 700 to 1,832. As a result of this explosion of student interest, and after preliminary assessment results suggesting learning communities may increase the retention rates of students, the university decided to fund learning communities permanently. Due to the rapid rate of growth of learning communities and the sizable allocation of funding in lean economic times, the institution has a keen interest in expanding the scope and variety of research efforts that examine the impact of this curricular reform on student learning and retention. This study will focus on a

population of students that heretofore has not been examined, but that represents a student population that research suggests might be at risk for dropout.

Though first-generation students comprise a sizeable proportion of college attendees (NCES, 1998), several researchers have noted that relatively little has been written about them (London, Richardson, & Skinner, 1992; Padron, 1992). Terenzini et al. (1996) noted that beyond the factors that shape first-generation students' persistence behaviors, they found no studies examining first-generation students' experiences during college. Terenzini et al. found that first-generation students in their study differed in a number of ways from their peers. These differences suggested potential learning issues. This study contributes to researchers' understanding of how first-year, first-time, first-generation students adjust to their first year of college on a residential campus.

This research project adds a quantitative study to the list of qualitative studies that already exist about first-generation students and retention. Braxton et al. (1997) indicated that it is important to continue to explore subpopulations to determine the retention issues related to them. This study adds to the knowledge about what impact first-generation status has at research institutions like Iowa State. In addition, it is significant because it explores a first-generation population that may be different from that investigated in many of the studies conducted to this point. Published studies have included disproportionate numbers of Hispanic participants (NCES, 1998; Padron, 1992). One reason for this is that many of the students who meet the first-generation criteria are older, part-time students often enrolled in community colleges (Bean & Metzner 1985; Chickering, 1974; Richardson & Skinner, 1992). This study informs the literature in that it examines traditional-age students in a

residential setting that is less ethnically diverse. Therefore this study examines a population of first-generation students that has received less empirical attention to date.

### **Definition of Terms**

A list of key terms follows. These terms are used throughout this study.

1. **Learning community:** Learning communities are a university-wide initiative launched in the fall of 1995 to provide opportunities for interested first-year students who have similar academic goals to take linked courses as a cohort and in some circumstances to opt for residential housing arrangements that group students by academic interests. Freshmen learning communities at Iowa State University are designed to help students meet degree requirements, adapt to the university way of life, and develop a sense of membership in the university community.

2. **First-generation student:** A student whose parents never attended a post-secondary institution of learning.

3. **Academic achievement:** The cumulative grade point average (GPA) received during the fall semesters of 1999 and 2000 and the spring semesters of 2000 and 2001 for first-generation students.

4. **Second-generation student:** A student who has at least one parent who has attended a post-secondary institution of learning.

5. **CIRP:** The Cooperative Institutional Research Program (CIRP) has developed a questionnaire that has been widely used and determined to be appropriate for students in all institutions. It is administered at the time of college enrollment.

6. **Residential learning communities:** Clusters of students who share a common

academic interest and reside on the same residence floor.

7. **Course-based learning communities:** Cohorts of student who share at least one class in common and receive additional out-of-class programming opportunities as a result of learning community involvement.

### **Research Questions**

After a review of the relevant literature, the following research questions were constructed to address the problem under study. A detailed list of the research hypotheses for this study can be found in the methods section.

1. Does learning community enrollment impact academic achievement among first-generation students in their first semester, and first year of attendance at a residential university?
2. Does learning community enrollment impact retention rates among first-generation students in the first year of attendance at Iowa State University?
3. Does enrollment in particular types of learning communities impact first-generation students' academic achievement?

### **Limitations**

1. Iowa State University, the site of the CIRP Freshman Interest Survey, is a unique land grant institution; thus, it may not be possible to generalize findings to other institutions that may not share a similar mission or institutional traits.
2. Students of minority status are underrepresented in the CIRP data set as this data is collected during orientation and fewer students of color attend orientation at Iowa State University.

3. The study does not control for motivational factors related to self-selection or difficulty of degree program.
4. The study does not use qualitative methods such as focus groups or interviews of faculty or students.
5. This study examines the experiences of first-generation, first-year students living in residence halls. Therefore, it excludes first-generation students who may commute or reside in Greek housing or apartments.
6. No intervening survey was used to measure students' adjustment to college. Data were obtained from the CIRP questionnaire and university records.

#### **Summary**

Arrayed before faculty and administrators are the pieces of a jigsaw puzzle. Varying in shape and size, each piece holds another clue that can help administrators perform the necessary task of transforming universities and colleges into institutions of learning that are equipped to meet the needs of a rapidly changing student body and national economy. When the puzzle is completely assembled, administrators will have creatively addressed the daunting issue of retention and stemmed the tide of student attrition at institutions of higher learning. Astin, Tinto and others have contributed to our understanding of student attrition. This study explores a subpopulation of students defined as first-generation who research suggests may be particularly at risk in college and university settings and seek to determine to what degree enrollment in learning communities impacts their college experience.

## CHAPTER 2. LITERATURE REVIEW

To explicate better the research problem, a review of current literature was conducted. Section one of the review explores the literature on first-generation students. Section two of this review addresses Tinto's interactionist model of student departure and the role of involvement in the retention process. The third section provides a synthesis of pertinent learning community research. The final section addresses the body of research on specific variables that have been investigated to explain dimensions of the student departure process.

### First-Generation Students Defined

Billson and Terry (1982) reported that Fuji Adachi (1979) formulated the concept of "first generation" to describe students who had one parent who had attended college. Since the term was introduced in the literature, its definition has changed substantially. Chickering (1974) and Cross (1972) defined students whose parents had not attended a post-secondary institution as first-generation. Because there often are similarities between first-generation and nontraditional students, the terms have been used synonymously. Billson and Terry (1987) argued that the data are confounded when researchers fail to draw distinctions between the two populations, since they may be quite distinct. Billson and Terry (1982) described first-generation status as a dichotomous variable: no college attendance by parents vs. college attendance by one or both parents. They have also treated it as a trichotomous variable: no parent has received a degree, one or both parents has received a degree, or both parents have received a degree beyond the bachelor's. In another variation, York-Anderson and Bowman (1991) defined first-generation as a student whose neither parents nor siblings had attended college for one year, arguing that it seemed unlikely that attendance of less than



a year would allow them to glean enough knowledge about the experience to pass on to others.

The variety of definitions cloud the research findings related to first-generation students and calls into question some of the scientific efforts that have attempted to explain the varied experiences of first-generation students. The National Center for Education Statistics, in its 1998 report, defined first-generation students as undergraduates whose parents have never enrolled in post-secondary education. That definition guides this study.

#### Attendance Patterns of First-Generation Students

Nationally, first-generation college students comprise a significant percentage of the student body of American universities and colleges. Though no national data have been analyzed from the 2000 census, the National Center for Education Statistics found that in 1989-90 almost half (about 43 percent) of the first-time beginning students were identified as first-generation (NCES, 1998). These students' attendance patterns differed by institutional type. At public four-year colleges and private, not-for-profit four-year institutions, first-generation students comprised 30 and 25 percent of the campuses' student populations, respectively. By far the highest enrollment patterns could be seen at public 2-year and private, for-profit institutions, where 50 and 66 percent of the student populations, respectively, were first-generation. The patterns reflected in this report, especially with respect to community college enrollment, are consistent with the literature on first-generation students (NCES, 1998).

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### Research on First-Generation Students

In his descriptive study of the Miami Dade Community College, Padron (1992) suggested that first-generation students differ from second-generation students in a number of ways. Padron asked faculty and administrators at the Miami Dade Community College to describe the educational behaviors and experiences of first-generation students attending their institution. After compiling their responses, Padron reported the following findings. First-generation students are intimidated and often overwhelmed by the educational system and have difficulty determining when the system can be flexible. An additional finding is that the home environment of first-generation students may be the opposite of a positive learning environment. To compound matters, parents and siblings who have never attended college often exhibit non-supportive and obstructionist behavior when a student breaks the traditional mold and attends college. Padron (1992) summarized that parents can be indifferent and even antagonistic to an educational system that may not have met their needs. Mare's (1980) work indicates that the non-supportive attitude can diminish students' educational aspirations.

Though many of the findings are consistent with other qualitative and quantitative research on first-generation students (Chickering, 1984; London, 1989; Terenzini et al., 1996), Padron's (1992) findings must be viewed cautiously. Miami Dade has drawn its conclusions about first-generation status by extrapolating and projecting percentages from the 1990 U.S. Census Bureau. Because Miami Dade did not collect first-generation data institutionally, social scientists are limited in their ability to generalize from the findings. Padron's (1992) study draws upon the impressions and insights of faculty and staff who

assessed the educational behaviors of students that they had reason to believe were first-generation. As a result there is a need for future studies to address this population of students and to utilize more precise and systematic methods of categorizing and measuring the impact of first-generation status on the college or university experience.

London's (1989) study is considered by many to be the seminal qualitative work on first-generation students. Using a sociological case study, London's work is superior to Padron's in several ways. First, his study follows more systematic procedures. Students were invited to participate in the study through notices; therefore, general assumptions are not made about their experiences based on administrator observations. Students were allowed to share their stories and serve as active participants in the study. The interviews were tape recorded and extended from one to seven hours (over several sessions). In addition, London's study includes participants from a variety of Boston-area colleges. Those institutions varied by type from community colleges to Ivy-league institutions.

London's (1989) work is significant because it contributes to our understanding of the role that family structures and culture play in influencing the college experiences of first-generation students. London (1989) used Stierlin's (1974) view of separation to explain the complex and powerful impact of family and role assignments in first-generation homes. Through his series of interviews with students, he found patterns of binding, delegating, and expelling. Binding occurs when parents interact with students in ways that keep them tied to the familial orbit. Delegating is a process in which a student moves out of the world of parents but remains tied to them through loyalty. Finally, he found instances of expelling, whereby parents neglected or rejected their students to the point that a premature separation

occurs. Though these patterns of separation are present in all households, London's study suggested that these patterns are particularly powerful when first-generation students attempt to break free from the familiar to embark on uncharted paths such as acquiring an educational degree beyond the high school diploma.

London (1989) concluded his study with the observation that the path of upward mobility or degree attainment often involves both gain and loss, and notes "that we begin to understand the attendant periods of confusion, conflict, isolation and even anguish that first-generation students report" (p. 168) when we consider this phenomenon.

Two quantitative studies conducted decades apart contribute similar information about first-generation students. York-Anderson and Bowman's (1991) study explored whether and to what degree first-generation students and second-generation students differed on their basic knowledge about college. Their sample consisted of students from a Midwestern community college. Students ranged from 18 to 53 years of age. A 72 item author-generated instrument was used. The first section assessed college knowledge using 28 true or false questions. The second section assessed perceived family support, and the third section questioned students about why they had attended college. Section two used 19 yes-no items and section three used 17 true or false items. After running analyses of variance, researchers concluded that there were significant differences between perceived family support for college attendance between first-generation students and second-generation students. They found that second-generation students perceived greater levels of support than did first-generation students. They claim that this finding may explain why first-generation students may find college more stressful. Because parents cannot pass on knowledge about

the higher education process, first-generation students may perceive that their parents are less supportive.

Although their study did not test for this, they conjecture that lack of knowledge may result in misguided educational plans. Finally, York-Anderson and Bowman (1991) concluded that students who perceived more family support for their college attendance had more factual information about college than did those students who perceived less support. They suggested that this finding may help explain the relationship between family support and college student success reported by Kirby (1976) and Woloshin (1976).

A decade before, Billson and Terry (1982) found similar results. Their study was undertaken at a private residential liberal arts college and a commuter state-supported liberal arts college. This study contributed to what we know about first-generation students because it moves beyond the community college and seeks to explain the impact of first-generational status on students attending four-year colleges. Billson and Terry's study sought responses from persisters and leavers from these institutions. A total of 701 respondents were surveyed with a response rate of 55 percent. They found that first-generation students and second-generation students have about the same degree of congruence about their expectations. However, they also found that first-generation students had lower levels of social integration than did second-generation students. They attributed this finding to a tendency of first-generation students to live off campus and suggested that their affiliational integration suffers. Though first-generation and second-generation students possessed equally high aspirations regarding level of education, those who withdrew were not strongly convinced that a higher education degree is the only route to success. Most significantly, the study

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found that integrational discrepancies seem to be aggravated for first-generation students because their values toward education differ from their parents' values and because they receive less support of all types from their parents. These findings related to parental support are similar to those of York-Anderson and Bowman (1991).

Terenzini and associates (1996) have done one of the most recent and comprehensive quantitative studies on first-generation students. As a context for their study, Terenzini and his associates identified three strands of studies that have sought to explain the impact of college on first-generation students. These strands are categorized in the following ways: One category of studies relates to first-generation students' pre-college expectations or college choice process (Attinasi, 1989; Stage & Hossler, 1989; York-Anderson & Bowman, 1991). In addition to these studies are those that concentrate on the transition between high school or work and college (Lara, 1992; Rendon, 1992). These studies, typically qualitative in nature, provide vivid accounts of personal experiences as students and families attempted to negotiate institutions of higher learning. A third category of studies examines the effects of college experiences on persistence in college. In most circumstances these studies have compared first-generation students to their more traditional peers (Bean & Metzner, 1985). They consistently reveal that first-generation students are at greater risk for attrition and that these students often experience lower levels of academic and social integration (Bean & Metzner, 1985; Billson & Terry, 1982).

Terenzini et al.'s (1996) longitudinal study draws upon elements of recent conceptualizations of college impact (e.g., Astin, 1984; Pascarella, 1985; Tinto, 1975; 1987). Their study was part of the National Study of Student Learning (NSSL), a three-year,

longitudinal, national study of over 4,000 new students who entered 18 four-year and 5 two-year colleges and universities nationwide. Three surveys were used to collect data. The NCTLA developed a pre-college survey, to gather demographic and background information. In addition, participants also completed Form 88A of the Collegiate Assessment of Academic Proficiency (CAAP). Developed by the American College Testing Program (ACT), it consists of multiple-choice items that measure selected general skills typically acquired by students during the first two years of college. A follow-up testing of the sample was conducted in Spring 1993 and used Form 88B of the CAAP and Pace's (1984) College Student Experiences Questionnaire (CSEQ) to measure students' first year experiences in college. Response rates were exceptionally high. Of the 3,840 students who participated in the Fall 1992 testing, 69% (2,685) also took part in the Spring 1993 data collection. Of these respondents 825 (30.7%) were first-generation.

Results revealed that first-generation students and traditional students differed on 14 of 37 pre-college characteristics. The largest differences between the two groups were on total family income and Hispanic status. In other words, first-generation students were more likely than not to be Hispanic. In addition, first-generation students reported having lower initial critical thinking abilities and lower degree aspirations, reported receiving less encouragement from family to attend college, and spent less time socializing with peers and friends in high school. First-generation students also tended to be older and have more independent children, and to be women.

Given that most of the variables on which first-generation and traditional students differ have been linked to academic performance and persistence (Pascarella & Terenzini,

1991), the combined portrait is one of students at academic risk. Despite the useful information that the study revealed, there were limits noted by Terenzini et al. (1996). Although the sample was multi-institutional (18 four-year, 5 two-year), the institutions were selected purposefully and not at random. This may limit the generalizability of the study. Also, although attempts were made in sampling design and through subsequent weighting of respondents to ensure that responses were representative, one cannot be sure that those who were willing to participate in the study responded in the same fashion as would those who were invited but declined to participate.

Besides those mentioned by Terenzini, there are additional limitations that signal the need for further exploration of this topic. Because this study is so broad in scope, it does not explore the unique attributes that may exist when one examines specific institutional settings and their impact on first-generation students. Also, one of the key findings of the study is that first-generation students are likely to be older than traditional-age students. This may be the first-generation profile of those who attend two-year colleges or urban colleges, but may be less true for four-year residential colleges or universities. As a result it would be interesting to know if the profile painted in the literature of first-generation students being more likely to be lower-income groups or disproportionately Hispanic holds true when a distinct four-year residential university is examined.

#### Academic and Social Integration

Though academic and social integration are widely acknowledged factors that contribute to our understanding of why students persist or depart an institution, the research is clear that both influence persistence in different ways for different students (Tinto, 1998). It



appears that social variables seem to be more important to persistence than academic variables in four-year colleges compared to two-year colleges. Tinto (1997) advanced the explanation that students attending two-year colleges are more likely to meet and interact with peers mainly in the classroom, whereas four-year residential students are much more likely to spend greater amounts of time on campus, both taking classes and engaging in out-of-class experiences. It would follow that academic involvement would be more important than social involvement at two-year colleges. It is equally understandable that on residential campuses social involvement might rise in importance as a variable that contributes to persistence. There is support for this contention in the body of literature that relates specifically to the impact of residential living arrangements on students (Astin 1984; Chickering, 1974; Pascarella, 1985; Pascarella & Terenzini, 1991).

#### Residence Living and Its Impact on Students

Pascarella, Terenzini, and Bliming (1994) indicated that residential living during college is consistently one of the most important determinants of student involvement or integration into the systems of an institution. Tinto (1994) suggested that an examination of residential living as a community experience might help to explain why and how residence life enhances persistence. He noted that residence halls provide scaled-down environments that enable "newcomers to find an early physical, social, and academic anchor during the transition to college life" (p. 125).

Numerous researchers contend that students who live in residence halls are significantly more likely to have contact with peers and faculty and more likely to participate in extracurricular activities (Billson & Terry, 1982; Chickering, 1974). Furthermore,

Pascarella (1985b) contended that the influence of residential living persists even when controls are made for differences in students' pre-college characteristics such as aptitude, extracurricular involvement, and socioeconomic status. With few exceptions (for instance, Dollar, 1966; Ryan, 1970) the research suggests that students who live on residential campuses are more satisfied with the social environment and positive about the personal/interpersonal environment than are their commuter counterparts. Such evidence of students' satisfaction with residential living has been used to support the theories of Astin and Tinto, who claim that students' tendency to remain on campus is related directly to their ability to involve themselves in the academic and social dimensions of the institution. The evidence suggests that this will occur with more frequency if the student resides on campus.

#### Residential Environments and Student Learning

Pascarella, Terenzini and Blimling (1994) noted that even when controls are performed for differences in pre-college characteristics such as academic performance, aptitude, and socioeconomic background, residential students in residence halls persist and graduate at significantly higher rates than do students who have not had this experience (Astin, 1975, 1982; Pascarella & Chapman, 1983). Though the research is highly supportive of Tinto's (1975, 1987, 1994) contention concerning the importance of social integration to retention, there is much that is yet to be known about how first-generation status and residential living interact. Pascarella et al. (1994) posited that students who live on campus enter college with traits that make them more likely to persist and graduate (Astin, 1985; Chickering, 1974; Pascarella, 1984). These pre-college characteristics include higher levels of academic aptitude, higher socioeconomic status, high school extracurricular involvement,

and pre-college commitment to the institution attended. Pascarella et al. (1994) concluded that residential living seems to provide additional advantages for students who begin college with individual attributes that make them more likely to exploit and benefit from this advantage. Astin (1977), after analyzing a national database, estimated that living in a residence hall translates into a 12% net advantage to students' chances of persisting in college and graduating.

These findings emphasize the importance of exploring the experiences of first-generation students in residential settings. The research suggests that first-generation students often enter institutions of higher learning with lower levels of support, lower socioeconomic status, and lower academic aptitudes (Billson & Terry, 1982; Riehl, 1994). It will be important to know whether or not they experience retention rates similar to second-generation students when they live in residence halls.

Another area of importance that the research has addressed is the impact of living in residence halls on academic achievement as measured by GPA. Indications are that the findings are mixed. One strand of inquiry reveals that students who live in residence halls receive higher grades (Nowack & Hanson, 1985; Simono, Wachowiak, & Furr, 1984). The other strand suggests that there are no group differences between the academic performance of students living in residence halls and those who live off campus (Hountras & Brandt, 1970; Taylor & Hanson, 1971). A few researchers even have suggested that students who live off campus earn higher GPAs than those who live on campus (Dollar, 1966).

In an effort to reconcile these two lines of inquiry, Blimling (1989) performed a meta-analysis of the influence of residence halls on academic performance. After controlling

for past academic performance, he found that there was neither an advantage nor a disadvantage to living in the residence halls compared to commuting. He suggested that the social milieu of residence halls can at times provide greater opportunities for socializing than studying. In this respect, as a result of the likelihood of less social interaction, the home environment may be more conducive to studying. Still, the evidence is far from conclusive and raises additional questions about whether there are types of residential experiences, or programs and configurations that might contribute to the academic performance of students.

The review of literature revealed a substantial body of information on living learning centers (LLCs). Though LLCs vary organizationally and structurally on campuses, they attempt to strengthen the integration between the students' living and learning environments and typically possess the following features: classes taught in residence halls, increased student-faculty contact, and students taking a common course together. The weight of the evidence suggests that there are educational benefits to living in LLCs. Clark (1988) and Pascarella and Terenzini (1980, 1981) found that students in LLCs perceive a stronger intellectual dimension and have significantly more interactions with faculty than their counterparts in conventional residence halls. With one exception (Nosow, 1975), the empirical evidence indicates that students in LLCs report significantly higher levels of satisfaction with their social climate than do students in conventional residence halls (Barnes, 1977; Pascarella & Terenzini, 1980; Terenzini & Pascarella (1980); Vander Wall 1972; Viehe, 1977). The evidence also suggests that students in LLCs perform better academically than do students in conventional residence halls (Barnes, 1977; Pascarella & Terenzini 1980,

1981; Vander Wall, 1972). This has held true even when such determinants of success as prior academic achievement and socioeconomic status are controlled for.

Considering the possible advantages that LLCs offer students in terms of increased satisfaction with social setting and increased academic achievement, it is not surprising that the research to date has indicated that students in LLCs persist at a higher rate than do students in traditional residence halls (Felver, 1983; Pascarella & Terenzini 1980, 1981). Though the preponderance of the evidence suggests that involvement in LLCs positively affects social integration and academic integration and contributes to higher retention rates, the results must be reviewed with caution. The research on LLCs also revealed that in most instances students must apply and be selected to live in LLCs. As a result it is quite possible that LLCs attract or select students with characteristics different than their counterparts who may be less inclined to pursue LLC living options. This signals a need for additional studies that explore residential arrangements where specific application and selection processes are not necessary for enrollment.

Researchers also have investigated other forms of housing arrangements. Among these are homogenous assignments by academic major and homogenous assignments of students by academic ability. Several researchers have found that high-ability students who are assigned to room with other high-ability students fare better than high-ability students who are assigned randomly (Duncan & Stoner, 1976; Streeter, 1972; Taylor & Hanson, 1971). Blimling (1993) posited that "the social organization of students with superior academic skills establishes a peer supported standard of academic achievement, manifest through increased competition for grades among students, peer recognition and status for

academic performance, and the establishment of study group networks supporting informal tutoring in common areas of academics” (p. 268). Blimling noted that residence groupings can create a peer culture in which initial aptitudes and motivation are accentuated, thus resulting in increased academic achievement. It should be noted that less is known about the impact of housing arrangements on average-ability or lower-level ability students. I found one refereed journal article that addressed this topic. Blimling and Hample (1979) conducted a quasi-experimental study comparing average-ability students living on a designated study floor to students who were randomly assigned. They found that students who were assigned to study floors had an advantage of .20 on a four-point scale over their counterparts who were assigned to more conventional housing arrangements. This finding suggests that there would be merit in exploring the impact of type of housing assignment on additional samples of average and high-risk students.

Homogeneous assignments by academic major have been studied on a small scale, and the results are mixed concerning the impact of these arrangements on academic achievement. Schroeder and Belmonte (1979) and Schroeder and Griffin (1977) found that students who were assigned homogeneously to residence halls by major performed better academically than students who were assigned randomly. Their findings were not confirmed by Elton and Bate (1966) or McKelfresh (1980). The evidence on homogenous groupings by major suggests, however, that students living in homogenous settings organized by major report higher levels of satisfaction and are more likely to persist in their particular field of study than students who are assigned randomly (McKelfresh, 1980).

A modicum of evidence suggests that homogeneous groupings by major can have positive implications for persistence in the major and in the college. Unfortunately, the majority of work has related to a specific area of study. Chapple (1984) and Schroeder and Griffin (1977) have explored the impact of homogenous housing assignment by major and found that engineering students in these housing arrangements are more likely to remain in engineering and to remain in the college than engineering students who were assigned randomly. In a subsequent study of science students, Light (1990) found that science students who studied science as a study group were significantly more likely to persist in a science curriculum than science students who studied alone.

These preliminary findings suggest that there may be benefits in grouping students by academic major or academic interest. Terenzini et al. (1994) suggested that homogenous groupings by major may create a peer culture that is supportive of the individual. As this peer culture will address similar academic challenges and course content, the individuals within it may have more resources to draw upon and thus a greater sense of social and academic connection. The current learning community movement is a curricular reform effort that attempts to capitalize on what researchers know about student involvement and the importance of social and academic integration by grouping students who possess similar academic interests in classroom settings and also into residential settings. The next section explores some of the research that has been conducted on learning community students.

### Learning Communities

The University of Washington and the University of Oregon have developed freshmen interest groups (FIGs) to improve the academic achievement of students (Gabelnick,

MacGregor, Mathews, & Smith, 1990; Shapiro & Levine, 1999). At both universities, students are organized around academic themes. These students are assigned a peer mentor, are co-enrolled in at least three classes, and attend an orientation class that is designed to enhance academic skills and assist students in building social and academic communities. The University of Missouri at Columbia adapted the FIG model further by incorporating a residential component. In an effort to explore the impact of residential freshman interest groups (FIGs) on student academic achievement and retention, Pike, Schroeder, and Berry (1997) conducted a study on the University of Missouri-Columbia campus. Their study attempted to test the findings of Tinto and Goodsell (1995), who found that FIG students at the University of Washington had significantly greater faculty-student interactions, higher levels of achievement, and persisted at higher levels than did non-FIG students. By placing their FIG students in residence halls, the University of Missouri hoped to build upon the successes of the Washington program (Pike, et al., 1997).

In the fall of 1995, Pike et al. (1997) surveyed 3,845 first-time college students attending the University of Missouri at Columbia. One hundred and thirty of the 400 FIG students responded and 888 of the students in traditional residence halls responded. The response rate was 38 percent. Chi-square tests showed that respondents were not significantly different from the entire research population in terms of economic status or academic majors. Using the freshman survey and additional scales developed by Pascarella and Terenzini (197) and Nora and Cabrera (1996), they were able to measure support from significant others, informal faculty-student interaction outside the classroom, and academic involvement.



Pike et al. (1977) found that residential learning communities did not directly improve students' persistence rates. Residential learning communities did indirectly enhance persistence by significantly increasing faculty-student interaction and enhancing the importance of faculty-student interaction to persistence. In addition, Pike et al. (1997) found that the FIG program did not directly or indirectly enhance students' academic achievement. They also found that institutional commitment was not a factor in the persistence of FIG students and in fact exerted a negative effect on persistence. The FIG program did not increase institutional commitment; but the effect of institutional commitment on persistence was negative. The third finding was that the FIG program did produce significantly higher levels of social integration, and social integration had a direct positive effect on persistence. However, social integration had a significant negative indirect effect on persistence. In a sense, the benefits of the social integration were minimized by the indirect negative impacts on retention; thus there were no significant differences between the two groups.

Pike et al. (1997) identified several limitations to their study. First, it was conducted in the first year of the FIG program. Many of the curricular reforms that might enhance academic achievement were not in place. Also they noted that because the study was conducted at a specific Research I institution, the generalizability of the study may be limited. They also noted that the results represent a snapshot in time and suggested that if the measure had been taken later in the year, it is possible that the relationships among factors predicting student success would have been different. They concluded by stating that additional research at a variety of institutions should be conducted to better understand how institutional characteristics affect efforts to improve student success.

### Student Attrition Models

Two models have emerged as central to the discussion of student attrition at institutions of higher learning. Pascarella and Terenzini (1991) noted that Tinto's interactionist model of individual student departure and Astin's theory of involvement are similar in their dynamics. Astin's theory of involvement (1984) derives from a longitudinal study of college student persistence (Astin, 1975), from which he concluded that the factors contributing to persistence were associated with students' involvement in college or university life and that the factors that contributed to departure were associated with lack of involvement. Astin's (1975) study revealed that every significant effect on students' persistence could be rationalized in terms of the involvement concept. Every positive factor increased students' involvement. Conversely, every negative factor was likely to reduce involvement. Astin summarized the basic principles of his theory in the following way and noted that student involvement refers to the amount of physical and psychological energy that the student devotes to the academic experience. Astin (1984) suggested: 1) involvement is the investment of physical and psychological energy in different objects; 2) involvement occurs along a continuum; 3) involvement includes quantitative and qualitative components; 4) the amount of student learning and personal development is directly proportional to the quality and quantity of involvement; and 5) "the effectiveness of any educational practice is directly related to the capacity of that policy or practice to increase involvement" (p. 298).

Astin (1984) suggested that his theory can explain most of the empirical knowledge about student development over the years and that it wedges psychoanalysis and classical learning theory. Based on his findings he recommended that higher education administrators

design structures and engage in practices that elicit sufficient student effort and investment of energy to promote the expected learning and development. Rosenshine (1982) concurred with Astin and has suggested that learning is greatly increased when the learning environment is structured to encourage active participation by the student. Furthermore, Astin (1984) noted:

Administrators and faculty members must recognize that virtually every institutional policy and practice (e.g., class schedule, regulations on class attendance, academic probation, and participation in honors courses). . . .can affect the way students spend their time and the amount of effort they devote to academic pursuits. Moreover, administrative decisions about nonacademic issues (e.g., location of new buildings; rules governing residency; recreation and living facilities) can significantly affect how students spend their time and energy. (p. 302)

Tinto (1994) also supported the pivotal role of student involvement in positive educational outcomes for college and university students. Tinto argued that if students are to become involved and thus integrated into the academic and social systems of the institution, they must navigate successfully the stages of separation, transition and incorporation. Separation could be defined as the students' ability to disassociate themselves from the norms of the past community. To separate successfully, a student must break free of the influence of family, high school friends, and other local ties. Transition occurs after separation and describes a state prior to the adoption of norms and behaviors of their new environment. Incorporation occurs when students adapt to and adopt the norms of their college or university community. Incorporation leads to integration. Tinto noted that integration does not necessarily ensure persistence; however, the likelihood of persistence is increased when students exhibit high levels of academic and social integration.

Tinto's contribution to educators' understanding of student departure deserves further discussion. Tinto originally looked to the works of Durkheim (1961) and Spady (1970) to begin to explain the process of student departure. Durkheim advanced the theory that suicide was more likely to occur when individuals were insufficiently integrated into the fabric of the society. He noted that critical components of that integration were moral integration and collective affiliation. He argued that if one's moral values or one's ability to form social attachments were highly divergent from others in the society, one would have a higher propensity to commit suicide. Spady (1970) first applied this concept to higher education settings, suggesting that college is a social system analogous to that of suicide in the wider society. In this scenario student departure from college would be the equivalent of suicide. Tinto (1975) continued to ponder this comparison, and questioned what critical components or conditions might result in educational suicide or departure from institutions of higher learning. Observing that colleges are composed of both social and academic systems, Tinto (1987) began to explore distinctions between these two dimensions and reached the conclusion that other factors were present that helped to explain individuals' decisions to persist or dropout.

Tinto (1975, 1987, 1994) suggested that there are psychological attributes that predispose certain individuals to suicide or dropout responses. These should not be limited to background characteristics of individuals such as sex, social status, high school experiences, or ability, but should be expanded to include expectations and motivational attributes of individuals. Two variables that help to describe these motivational factors are educational goal commitment-individual's expectation of completing a two-year, four-year, or graduate

degree, and institutional commitment-dispositional, financial, and time commitments individuals make in attending a particular institution (or type of institution). Tinto recommended including these various variables into a theoretical model of dropout or departure. The model suggests that dropping out of college can be viewed as a longitudinal process of interactions between the individual and the academic and social systems of the college. The person's experiences in those systems continually contribute to his or her goal and institutional commitments in ways that lead to persistence and/or varying forms of dropout. Tinto (1975) noted, "Other things being equal, the higher the degree of integration of the individual into the college systems, the greater will be his/her commitment to the specific institution and to the goal of college commitment" (p. 54).

Pascarella and Terenzini (1980) attempted to test the Tinto model and expand upon it by developing an instrument that could measure social and academic integration and thus predict which students had a propensity to persist or withdraw from the institution. Their study was conducted at Syracuse University and involved a simple random sample of 1,905 persons drawn by a computer from the total population of incoming freshmen. One thousand four hundred students returned the initial survey for a response rate of 76%. An additional survey was mailed in the spring of 1977 and 773 freshmen (53.1 %) responded to the survey. A chi-square analysis that was performed to determine the goodness of fit revealed that the students who responded were representative of the freshman class of Syracuse. To assess the dimensions of social and academic integration, and of goal and institutional commitment, five-part Likert items were developed. According to Tinto's model, academic integration is determined by the student's academic performance and his or her level of intellectual

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development. Social integration is a function of quality of peer group interactions and the quality of a student's interaction with faculty.

Thirty-four items were selected by the researchers; these items were aggregated into five scales measuring peer group interactions, interactions with faculty, faculty concern for student development and teaching, academic and intellectual development, and institutional and goal commitment. What resulted was an instrument that measured institutional integration. This instrument was added to the spring assessment. Since a substantial body of research points to the need to control for pre-entrance characteristics when assessing persistence trends, Pascarella and Terenzini (1980) built ethnicity, sex, academic aptitude, parental education, and 13 other variables into a discriminant analysis model.

When added to the discriminant analysis model, the five-scale instrument developed by Pascarella and Terenzini (1980) increased correct identification of persisters and dropouts in a cross-validation sample from 58.2 percent to 81.4 percent and from 34.5 percent to 75.8 percent, respectively. Scores on the five scales alone predicted 78.9 percent of the cross-validation persisters and 75.8 percent of the students in the sample who dropped out.

Though these findings lend support to the predictive validity of the major dimensions of Tinto's (1975) model, Pascarella and Terenzini (1980) commented that caution must be observed. Additional analysis revealed significant interactions between sex and scores on the peer-group interactions and between sex and institutional goal commitment scales. This finding suggests that to some extent predicting persistence/dropout behavior may depend on the kinds of students being considered. They recommended that future research might focus on similar interactions between student characteristics and specific institutional experiences.

### **Summary of the Literature Review**

Several researchers have investigated the experiences of first-generation students in college (Billson & Terry, 1982; Chickering, 1984; London, 1989; Terenzini, et al., 1996; York-Anderson & Bowman, 1991). Based on their studies, we know that nationally first-generation students often come from homes that have background characteristics associated with risk for attrition. In general, they are likely to originate from lower-income families and often have lower achievement scores and lower degree aspirations (NCES, 1998). In addition, we know that these students comprise 30 percent of the higher education student population and that the majority of these students tend to enroll in public two-year colleges. Despite the work that has been conducted to this point, there is much that needs to be discovered. Less is known about the first-generation students who attend residential colleges and the factors that impact their persistence.

Several of the studies on first-generation students have been qualitative in nature (London, 1989; Terenzini et al., 1994; Padron, 1992; Richardson & Skinner, 1992). Few have explored this subject using quantitative methods (Terenzini et al., 1996). Qualitative methods of inquiry provide rich descriptions of the students' experiences but this topic could be explored further by quantitative methods as well.

Tinto (1994) and others (Braxton, et al., 1990; Pascarella & Terenzini, 1991) have attempted to explain the process of student departure and have developed an interactionist model that suggests that students' departure decisions are typically a result of failure of the student to engage with the social and academic networks of the institution. Components of

Tinto's model include pre-college characteristics: parental education, which is highly correlated with income; high school rank and GPA; ACT scores; gender; and ethnicity. In addition, Tinto suggested the importance of goal commitment, which is the students' motivation to reach a particular educational goal. He has incorporated these key variables into a model that had been cited over 400 times by 1994. His model and several of the variables that he has determined help explain persistence were used in this study. His model serves as the theoretical framework of this study.

Social and academic integration are thought to greatly influence students' decisions to persist or depart an institution (Tinto, 1998). Braxton, Sullivan, and Johnson (1997) suggested that social and academic integration are more important to persistence in four-year institutions than in other institutions. Researchers suggest that the residential life experience may play a role in integrating students into the social fiber of the institution (Pascarella, et al., 1994). In recent years there have been attempts to strengthen the connection between residence life programs and academic entities. These attempts resulted in collaborative partnerships being formed between student affairs professionals and academic personnel (Shapiro & Levine, 1999). One result of this collaboration is the growth of learning communities, which often have a residential component.

Learning communities are curricular reforms that seek to capitalize on what the literature has revealed about student persistence (Gabelnick et al., 1990; Shapiro & Levine, 1999). Grouping students by academic interest is believed to increase students' academic engagement and thus increase the likelihood that they will persist. This study examines different types of learning community experiences to determine if those that incorporate



living arrangements have a greater effect on first-generation students than those which do not include a living option.

This study examines the impact of learning community involvement on the GPAs and retention of first-year, first-generation students at Iowa State University. It contributes to the current body of knowledge because it focuses on a student population about which more information is needed. In addition, it adds to what we know about the impact of learning community enrollment on students.

### CHAPTER 3. METHODOLOGY

This chapter describes the setting for the study, the subjects, the research process, and the statistical procedures that were used to explore the research question of the role learning community enrollment has on the GPAs and retention rates of first-generation students in their first year of university enrollment.

#### Setting

Iowa State University is a public residential university with a land grant mission and a strong emphasis on science and technology. Iowa State University is moderately selective. During the years of the study (1999-2000), approximately 26,300 students attended the institution each year. Of that number, approximately 3,500 were first-year students living in the residence halls. Students who were accepted in Fall 1999 and Fall 2000 had mean ACT scores of 24.4, and 91 percent ranked in the upper 50% of their classes ( Fact Book, 2001).

#### Data Access

To gain access to the data sets that were used in this study, I met with the program coordinator and records analyst in the Office of the Registrar of Iowa State University and discussed my proposed study. I was required to complete the permission to use university records form and submit it to the Registrar. Following review of the form by the Registrar, I gained access to the data. These Cooperative Institutional Research Program (CIRP) data sets are available through the Office of the Registrar, Office of the Institutional Research, and through the Department of Residence Research and Assessment Office. I elected to use the data files that are accessible through the Department of Residence Research and Assessment Office.

## Subjects

The subjects of this research study were first-year, first-time, first-generation and second-generation students who enrolled at Iowa State University in the Fall semesters of 1999 and 2000 and who resided in the residence halls during the Fall semesters of enrollment. First-generation students were defined as those undergraduate students whose parents never enrolled in an institution of higher learning. Approximately 44% of the undergraduate students were female and 56% were male. In the Fall of 1999, 1,779 students were enrolled in learning communities. In the Fall of 2000, 1,838 students were enrolled in learning communities. This membership varied among course-based learning communities, residential-only learning communities, and course-based and residential learning communities.

Table 1. Learning Community Enrollment

Fall Semester	1999	2000
Type of Learning Community	N	N
Course-based Only	921	703
Residential Only	93	69
Course-based and Residential	765	1,054
Total Learning Community Enrollment	1,799	1,838

## The Sample

The sample for this study was drawn from first-year, first-time students who enrolled at Iowa State University during the Fall semesters of 1999 and 2000 and completed the CIRP

instrument at the time of enrollment. This population was limited further by restricting the cases to students who resided in the residence halls during the Fall semester of enrollment. I used the SPSS program to sort the data sets. Students who responded to the CIRP items on the highest level of education achieved by mother or father were selected and comprised the accessible population. In the Fall 1999 cohort there were 170 students who met the first-generation criteria. In the Fall of 2000 cohort there were 147 first-year students living in residence halls who met the first-generation criteria. Due to the small sample size and the need to distribute these cases over three categories - course-based learning community involvement, residence-based learning community, non-learning community involvement - each available case was used to comprise the first-generation cohort groups.

A sample of second-generation students was drawn to serve as a comparison group. As there were many available cases of second-generation students, a random sampling technique was used to determine cases that would be observed. The SPSS program was commanded to randomly sort cases. After the cases had been electronically sorted, the researcher selected the first 200 cases from each cohort (Fall 1999) and (Fall 2000). These students comprise the comparison group.

### The Instrument

The Cooperative Institutional Research Program (CIRP) Freshman Survey was used to provide data. Begun in 1966 by Alexander Astin, CIRP is a continuing longitudinal study of the American higher system sponsored by the American Council on Education (ACE) and the graduate School of Education at UCLA. Participating institutions receive a detailed profile of their entering freshmen class, as well as national normative data for students in

similar types of institutions. For universities to be included in the national data bank, CIRP requires that 75% of the institutions' first-time full-time population return the survey. The CIRP Freshman Survey is an independent questionnaire designed for use by institutions of higher learning. In addition to demographic variables, the four-page instrument covers a broad array of issues ranging from college finances to reasons for attending college and high school experiences. The CIRP was especially appropriate for this study because it includes several pre-entrance variables that research suggests contribute to researchers' understanding of persistence. The instrument contains 48 items and upwards of 100 responses are possible: only items deemed germane to this study were selected. These included: ethnicity, gender, mother's education, father's education, high school rank, and ACT composite scores.

The Office of the Registrar student files database was also used to determine learning community enrollment, retention rates, and first semester and cumulative GPAs for the Fall 1999 and Fall 2000 cohorts.

### Research Hypotheses

1. First-year, first-generation students who enroll in learning communities will achieve higher GPAs in the Fall semester of attendance than will first-generation students who are not enrolled in learning communities.
2. First-year, first-generation students who enroll in learning communities will achieve higher GPAs in the second semester of attendance than will first-generation students who are not enrolled in learning communities.

3. **First-year, first-generation students who enroll in learning communities will achieve higher GPAs in the first year of attendance than will first-generation students who are not enrolled in learning communities.**
4. **First-year, first-generation students who enroll in learning communities that are course-based and residential will attain higher GPAs in their first year of attendance than will first-generation students who are not enrolled in this type of learning community.**
5. **First-year, first-generation students who enroll in learning communities which are course-based and residential will achieve higher GPAs in the Fall semester of attendance than will first-generation students who are not enrolled in this type of learning community.**

### **Research Design**

A quasi-experimental design was used to test each null hypothesis associated with the converse of the research hypotheses listed above. The quasi-experimental method examines differences between preexisting groups of subjects or differences in preexisting conditions (Gravetter & Wallnau, 1992). In this study, enrollment in learning communities served as the independent variable and GPA and retention served as dependent variables.

Students who had responded to the CIRP item 27 (What is the highest level of formal education obtained by your parents?) were sorted into two groups. First-generation students are those whose parents did not attend a postsecondary institution. Second-generation students are those students who have at least one parent who has received a bachelor's degree. In the second level of analysis, students were sorted into one of three categories:

non-learning community enrollees, course-based learning community enrollees, and residential-based learning community enrollees. Additional tests were conducted to measure the impact of learning community involvement on first-generation students' GPAs and retention rates in their first year of college attendance.

### Statistical Tests

Two statistical tests will be used to evaluate each research hypothesis. Analysis of covariance (ANCOVA) is a statistical procedure that compares the amount of between-groups variance in individuals' scores with the amount of within-groups variance. If the ratio of between groups variance to within-groups variance is sufficiently high, this indicates that there is more difference between groups on a particular variable than there is within each group.

Logistic regression was used to test the research hypothesis for which the dependent variables were dichotomous in nature. There are two advantages to using logistic regression. It has much greater flexibility in the use of control variables than does chi-square. Logistic regression also produces odds ratios associated with each predictor value. The odds ratio of an event is defined as the probability of the outcome event occurring divided by the probability of the event not occurring. As a result, the researcher can determine better the exact relationship between the independent variable and the dependent variable ([http://www.brynmawr.edu/acads/GssW\\_vartanian/six1.html](http://www.brynmawr.edu/acads/GssW_vartanian/six1.html), 2001).

Table 2. Statistical Tests

Hypotheses	Statistical Test
1	Analysis of Covariance
2	Analysis of Covariance
3	Analysis of Covariance
4	Analysis of Covariance
5	Logistic Regression

To test research hypotheses one through four, analysis of covariance was used. To address research hypothesis five, logistical regression will be used. Table 2 reflects the statistical procedures that were used.

The methods and procedures that were discussed in this chapter were used to determine the impact of learning community enrollment on the academic achievement and retention rates of first-year, first-generation students' academic achievement and retention rates.



## CHAPTER 4. RESULTS

This chapter presents the results of the statistical data analyses that were conducted to address the research questions listed in Chapter One of this study and the resulting hypotheses provided in Chapter Three. The sample consisted of first-year, first- and second-generation students enrolled in their first year at a residential university. The statistical techniques of univariate analysis of covariance and binary logistic regression were employed to address the research hypotheses testing the impact of learning community enrollment on first-generation students' academic achievement and retention rates in the first year of enrollment at Iowa State University. An alpha level of .05 was used to determine the significance of all statistical tests. Learning community enrollment type served as the fixed factor predictor variable in the statistical analysis. Students were sorted into cohorts based on year of enrollment. Each cohort was analyzed separately. Fall Semester 1999 and 2000 GPAs, Spring Semester 2000 and 2001 GPAs, and cumulative Spring Semester 2000 and 2001 GPAs and both year-to-year and semester-to-semester retention comparisons served as dependent variables in the analyses. Due to small numbers of cases in various ethnic categories, ethnicity was recoded into a dichotomous variable, where 0 represented "not white" and 1 represented "white." Some students responded to the ethnicity variable with a response of "prefer not to indicate." This response was coded as a missing value.

There are two sections in this chapter. The first section compares GPAs between first- and second-generation students enrolled and those not enrolled in learning communities. Separate analyses were performed on cohorts of students who enrolled in Fall

1999 and Fall 2000. In the second section, retention rate comparisons between first- and second-generation students enrolled and not enrolled in learning communities are explored. Separate analyses were performed on cohorts of students who enrolled in Fall 1999 and Fall 2000. In both sections impact of learning community enrollment and first-generation status were the primary predictor variables of consideration.

### Descriptive Statistics

Table 3. Descriptive Statistics of Fall 1999 Cohort

Generation Status	N	Percentage
First-Generation	170	45.9
Second-Generation	200	54.1
Total	370	100.0
Learning Community Enrollment	N	Percentage
Not Learning Community	196	33.0
Learning Community	174	47.0
Total	370	100.0
Gender	N	Percentage
Female	187	50.5
Male	183	49.5
Total	370	100.0
Ethnicity	N	Percentage
Not White	28	7.6
White	318	85.9
Total	346	93.5
Missing	24	6.5
Total	370	100.0

In the Fall 1999 cohort there were 370 cases. The percentages of first-generation students and those who were second-generation were similar, 45.9% and 54.1%, respectively. Gender and LC enrollment (LCEN) students were also evenly distributed at rates of 50.5% female and 49.5 male, and 53% not LC and 47% LC, respectively. The ethnicity percentages were highly disproportionate. Non-white students accounted for 7.6% of the sample and white students accounted for 85.9% of the sample; the remainder (6.5%) did not indicate ethnicity.

Table 4. Descriptive Statistics of Fall 2000 Cohort

Generation Status	N	Percentage
First-Generation	147	42.4
Second-Generation	200	57.6
Total	347	100.0
Learning Community Enrollment	N	Percentage
Not Learning Community	242	69.7
Learning Community	105	30.3
Total	347	100.0
Gender	N	Percentage
Female	181	52.2
Male	166	47.8
Total	347	100.0
Ethnicity	N	Percentage
Not White	37	10.7
White	288	83.0
Total	325	93.7
Missing	22	6.3
Total	347	100.0

There were 347 cases in the Fall 2000 cohort. Forty-two percent of the cohort were first-generation and 57.6% were second-generation. The Fall 2000 cohort differed from the Fall 1999 cohort in two distinct ways. Fewer students who identified themselves as first-generation in the Fall 2000 cohort and fewer first-year students were enrolled in learning communities. About 70% of the students in this cohort were not involved in learning communities and 30.3% were enrolled in learning communities. It is unclear why the Fall 2000 cohort included fewer cases of students who first-year students who enrolled in learning communities, but a partial explanation may be that there was a reduction in the number of students who identified themselves as first-generation. Several learning communities target students that are more likely to be first-generation. In addition, in 2000 the number of first time, first-year students who enrolled in learning communities also decreased. These two factors certainly contributed to there being dissimilar numbers of first-generation students enrolled in learning communities in the 2000 cohort. The Fall 2000 cohort is similar to the Fall 1999 cohort with respect to the disproportionate number of "white" as compared to "not-white" students. In Fall 2000 10.7% of the cohort was "not-white" as compared to 83% who indicated that they were "white" and 3.6% who did not indicate their ethnicity.

### **Hypothesis Testing**

The following research hypotheses examined the impact of learning community enrollment on first-generation students' GPAs and retention rates in the first year of university enrollment.

### Research Hypothesis One

*Research Hypothesis One: First-year, first-generation students who enroll in learning communities will achieve different GPAs in their first semester of enrollment than will first-generation students who are not enrolled in learning communities.*

LC enrollment was a fixed factor where 0 = non-learning community enrollment, 1 = learning community enrollment. Individual models were built for each cohort to test this hypothesis. First-generation status (FRSTGEN) and ethnicity (ETHNR) functioned as fixed factor predictor variables. In both models, Fall 1999 GPA and Fall 2000 GPA served as the dependent variables. High school rank (HSRANK) and ACT Composite (ACTCMP) functioned as covariates.

Using identical procedures, univariate analysis of covariance models were built to examine the impact of learning community enrollment on first-generation students' first-semester GPAs for the Fall 1999 and Fall 2000 cohorts. All main effects and two-way interactions were loaded into the initial models. All interactions and main effects that were found to be significant at the appropriate alpha level ( $p < .05$ ) were retained for the final model.

The Fall 1999 final model included the following main effects and two-way interactions: ACT composite (ACTCMP), gender (GEN) \* high school rank (HSRANK), gender (SEX\_CD)\* ACT composite (ACTCMP), and high school rank (HSRANK)\*ACT composite (ACTCMP). The value of adjusted  $R^2$  for this model estimating Fall 1999 GPA was  $R^2_{adj} = .424$ . Results of the model revealed that learning community enrollment had no significant impact on the first semester GPAs of first-generation students. In this model the

interactions of gender (GEN) \* high school rank (HSRANK), gender (GEN) \* ACT composite (ACTCMP), and high school rank (HSRANK) \* ACT composite (ACTCMP), as well as the main effect of ACT composite (ACTCMP), were better predictors of first-semester grade point averages than was learning community enrollment. (See Table 5).

Table 5. Factors Significantly Impacting Mean Fall 99 GPA for Fall 1999 Cohort

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected	115.977	5	23.195	50.186	.000
Intercept	4.660	1	4.660	10.083	.002
(GEN)* (ACTCMP)	4.897	1	4.897	10.596	.001
(GEN)* (ACTCMP)*	5.872	2	2.936	6.353	.002
(HSRANK)	5.937	1	5.937	12.846	.000
(ACTCMP)	3.484	1	3.484	7.537	.006
Error	152.062	329	.462		
Total	2736.558	335			
Corrected	268.039	334			

a Computed using alpha = .05

b  $R^2 = .433$  ( $R^2_{adj} = .424$ )

To fit the Fall 2000 model an additional step was performed. In the overall model the interactions of ethnicity (ETHNR) \* high school rank (HSRANK) and gender (GEN) \* high school rank (HSRANK) were found to be the only significant predictors of GPA. When all non-significant predictor variables were excluded from the model, the gender (GEN) \* high school rank (HSRANK) interaction was no longer significant. The adjusted  $R^2$  value for the model which included gender (GEN) \* high school rank (HSRANK) was ( $R^2_{adj} = .230$ ). In

the final model that excluded gender (GEN) \* high school rank (HSRANK), the adjusted  $R^2$  value for the model estimating first-semester GPAs for the Fall 2000 cohort was ( $R^2_{adj} = .232$ ). This was a modest improvement over the model that included both two-way interactions of high school rank with ethnicity (ETHNR) and with gender (GEN). LC enrollment (LCEN) and first-generation status (FRSTGEN) were poor predictors of first semester GPAs for the Fall 2000 cohort. The interaction of high school rank (HSRANK) with ethnicity (ETHNR) was the single best predictor of first semester grade point averages for the Fall 2000 cohort. (See Table 6).

Table 6. Factors Significantly Impacting Mean Fall 2000 Semester GPA for Fall 2000 Cohort

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	47.219	2	23.610	46.278	.000
Intercept	18.277	1	18.277	35.825	.000
(ETHNR)* (HSRANK)	47.219	2	23.610	46.278	.000
Error	151.519	297	.510		
Total	2329.939	300			
Corrected	198.738	299			

a Computed using alpha = .05

b R Squared = .238 ( $R^2_{adj} = .232$ )

As learning community enrollment and first-generation status were the primary variables of concern in this study, additional tests were preformed to determine the extent to which these variables explained the variance between groups. A two-way analysis of variance model was estimated, which included learning community enrollment and first-

generation status. In the Fall 1999 cohort, first-generation status did not attain significance as a predictor of that Fall semester's GPAs. LC enrollment (LCEN) was significant, but explained very little of the variance (partial  $\eta^2 = .032$ ). The model estimating the impact of first-generation status (FRSTGEN) and LC enrollment (LCEN) had an adjusted  $R^2$  value of .027 and explained very little of the difference between students. (See Table 7).

Table 7. Effects of First-Generation Status and Learning Community Enrollment on Fall 1999 Semester GPA for Fall 1999 Cohort

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	10.280	3	3.427	4.364	.005	.035
Intercept	2698.037	1	2698.037	3435.810	.000	.904
(FRSTGEN)* (LCEN)	.364	1	.364	.463	.496	.001
(FRSTGEN) (LCEN)	.370	1	.370	.471	.493	.001
	9.392	1	9.392	11.960	.001	.032
Error	285.053	363	.785			
Total	3023.345	367				
Corrected Total	295.333	366				

a Computed using alpha = .05

b  $R^2 = .035$  ( $R^2_{adj} = .027$ )

Table 8 reflects the Fall 1999 cohort Fall semester mean GPAs for first-generation students and second-generation students. First-generation students who enrolled in learning communities had higher mean GPAs in their first semester of attendance ( $m=2.95$ ) than did first-generation students who were not enrolled in learning communities ( $m=2.57$ ).



**Table 8. Mean Fall 1999 Semester GPA for Fall 1999 Cohort by First-Generation Status and Learning Community Enrollment**

(FIRSTGEN)	LC Enrollment	Mean	Std. Deviation	N
Yes	Not LC	2.57	.89817	80
	LC	2.95	.87783	88
	Total	2.77	.90580	168
No	Not LC	2.57	.90488	113
	LC	2.83	.85801	86
	Total	2.68	.89206	199
Total	Not LC	2.57	.89976	193
	LC	2.89	.86794	174
	Total	2.72	.89829	367

In the Fall 2000 cohort, neither first-generation status nor learning community type were significant predictors as main effects in the model. However, the interaction of first generation status (FRSTGEN) with LC enrollment (LCEN) was significant at the alpha level ( $p < .05$ ). The adjusted  $R^2$  value for this model was .012. An additional model was tested to determine the predictive ability of the model if the main effects of LC enrollment (LCEN) and first-generation status (FRSTGEN) were omitted. In that model the interaction of first-generation status (FRSTGEN) with LC enrollment (LCEN) was no longer significant. The  $R^2$  value remained .012.

**Table 9. Mean Fall 1999 Semester GPA for Fall1999 Cohort by First-Generation Status and Learning Community Enrollment**

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	5.003	3	1.668	2.366	.071	.021
Intercept	2004.583	1	2004.583	2843.640	.000	.894
(FRSTGEN)* (LCEN)	3.803	1	3.803	5.394	.021	.016
(FRSTGEN)	1.047	1	1.047	1.485	.224	.004
(LCEN)	.753	1	.753	1.068	.302	.003
Error	238.268	338	.705			
Total	2600.810	342				
Corrected Total	243.271	341				

a Computed using alpha = .05

b  $R^2 = .021$  ( $R^2_{adj} = .012$ )

Table 10 reflects the mean Fall semester GPAs for the Fall 2000 cohort. The mean Fall semester GPA for first-generation students who enrolled in learning communities was slightly lower ( $m=2.52$ ) than for first-generation students who were not enrolled in learning communities ( $m=2.65$ ). This phenomena was reversed for second-generation students where students who enrolled in learning communities obtained slightly higher GPAs ( $m=2.87$ ) than did second-generation students who were not enrolled in learning communities ( $x=2.54$ ).

Table 10. Fall 2000 Semester Mean GPA for Fall 2000 Cohort Learning Community Enrollment

(FIRSTGEN)	LC Enrollment	Mean	Std. Deviation	N
Yes	Not LC	2.65	.7976	96
	LC	2.52	.8886	49
	Total	2.61	.8286	145
No	Not LC	2.54	.9043	142
	LC	2.87	.6754	55
	Total	2.63	.8581	197
Total	Not LC	2.58	.8628	238
	LC	2.71	.7989	104
	Total	2.62	.8446	342

### Research Hypothesis Two

*Research Hypothesis Two: First-year, first-generation students who enroll in learning communities will achieve different Spring semester GPAs in their first semester of enrollment than will first-generation students who are not enrolled in learning communities.*

LC enrollment (LCEN) was a fixed factor where 0 = non-learning community enrollment, 1 = learning community enrollment. Individual models were built for each cohort to address this hypothesis. First-generation status (FRSTGEN) and ethnicity (ETHNR) functioned as fixed factor predictor variables. In the Fall 1999 cohort and Fall 2000 cohort, Spring GPA 2000 and 2001 served as the dependent variables, respectively. High school rank (HSRANK) and ACT composite (ACTCMP) functioned as covariates.

The Fall 1999 model measuring the impact of learning community enrollment on Spring Semester 2000 GPAs included the two-way interactions that were shown to be

significant at the alpha level ( $p < .05$ ). The interactions of high school rank (HSRANK) \* ACT composite (ACTCMP) and gender (GEN) \* LC enrollment (LCEN) reached this level of significance. Analysis indicated that first-generation students who enrolled in learning communities obtained the same spring semester mean GPAs as first-generation students who are not enrolled in learning communities; consequently this interaction was omitted from the model summarized in Table 11. There was a significant interaction between Gender (GEN) and one of the primary variables of concern-LC enrollment (LCEN) ( $p < .05$ ); however, this interaction was not addressed in the research question and further analysis was not conducted. The adjusted  $R^2$  value for the final model measuring Spring 2000 GPA as determined by the tests of between-students effects was ( $R^2_{adj} = .377$ ).

Table 11. Factors Significantly Affecting Spring 2000 GPA for Fall 1999 Cohort

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	96.994	5	19.399	38.863	.000
Intercept	13.692	1	13.692	27.430	.000
(GEN)* (LCEN)	4.863	3	1.621	3.247	.022
(HSRANK)* (ACTCMP)	80.489	1	80.489	161.249	.000
(ETHNR)	3.308	1	3.308	6.626	.011
Error	153.741	308	.499		
Total	2421.485	314			
Corrected Total	250.735	313			

a Computed using alpha = .05

b  $R^2 = .387$  ( $R^2_{adj} = .377$ )

The Fall 2000 model measuring the impact of learning community enrollment on Spring Semester 2001 GPA included the two-way interactions that were shown to be significant at the ( $p < .05$ ) alpha level: first-generation status (FRSTGEN) \* high school rank (HSRANK), first-generation status (FRSTGEN) \* ACT composite (ACTCMP), gender (GEN) \* high school rank (HSRANK), and gender (GEN) \* ACT composite (ACTCMP). Analysis indicated that first-generation students who enroll in learning communities obtained the same spring semester mean GPAs as first-generation students who are not enrolled in learning communities; consequently, this interaction was omitted from the model summarized in Table 12. Although the two-way interactions of first-generation status (FRSTGEN) with high school rank (HSRANK) and with ACT composite (ACTCMP) were significant predictors of GPA, first-generation status (FRSTGEN) was not significant as a main effect and did not interact significantly with LC enrollment (LCEN). Therefore, no further analysis was conducted.

Table 12. Factor Significantly Affecting Spring 2000 Mean GPA for Fall 1999 Cohort

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	45.850	6	7.642	14.397	.000
Intercept	7.525	1	7.525	14.178	.000
(FRSTGEN)* (HSRANK)	2.345	1	2.345	4.419	.036
(FRSTGEN)* (ACTCMP)	3.264	1	3.264	6.149	.014
(ACTCMP) (GEN)* HSRANK)	6.413	1	6.413	12.083	.001

Table 12. (Continued)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
(GEN)*(ACTCMP)	7.503	1	7.503	14.135	.000
Error	144.372	272	.531		
Total	2250.570	279			
Corrected Total	190.222	278			

a Computed using alpha = .05

b  $R^2 = .241$  ( $R^2_{adj} = .224$ )

As LC enrollment (LCEN) and first-generation status (FRSTGEN) were the primary variables of concern in this study, additional tests were performed to determine if these variables alone explained any of the variance between groups. A two-way analysis of variance model was estimated, which included learning community enrollment and first-generation status as the fixed effects. In the Fall 1999 cohort, neither first-generation status nor learning community enrollment reached significance as predictors of Spring GPA for the Fall 1999 cohort. In addition, the adjusted  $R^2$  value was negligible ( $R^2_{adj} = .001$ ). (See Table 13).

Table 13. Effects of First-Generation Status and Learning Community Enrollment on Spring 2000 Mean GPA of the Fall 1999 Cohort

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	2.555	3	.852	1.104	.347	.010
Intercept	2342.886	1	2342.886	3038.066	.000	.899
(FRSTGEN)*(LCEN)	.931	1	.931	1.208	.273	.004

Table 13. (Continued)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
(FRSTGEN)	2.449E-03	1	2.449E-03	.003	.955	.000
(LCEN)	1.849	1	1.849	2.398	.122	.007
Error	262.971	341	.771			
Total	2670.461	345				
Corrected Total	265.526	344				

a Computed using alpha = .05

b  $R^2 = .010$  ( $R^2_{adj} = .001$ )

Table 14 reflects the Spring 2000 semester mean GPAs for the Fall 1999 cohort. The mean Spring semester GPA for first-generation students who enrolled in learning communities was higher ( $x=2.76$ ) than for first-generation students who were not enrolled in learning communities ( $x=2.51$ ). This difference in mean GPA was not as pronounced for second-generation students where Spring mean GPA was ( $x=2.65$ ) for students enrolled in learning communities and ( $x=2.61$ ) for students not enrolled in learning communities.

Table 14. Spring 2000 Semester Mean GPA for 1999 Cohort by First-Generation Status and Learning Community Enrollment

(FRSTGEN)	(LCEN)	Mean	Std. Deviation	N
Yes	Not LC	2.51	.85360	70
	LC	2.76	.96155	83
	Total	2.65	.91956	153
No	Not LC	2.61	.79317	108

Table 14. (Continued)

(FRSTGEN)	(LCEN)	Mean	Std. Deviation	N
	LC	2.65	.91549	84
	Total	2.63	.84682	192
Total	Not LC	2.57	.81655	178
	LC	2.71	.93747	167
	Total	2.64	.87857	345

In the Fall 2000 cohort, neither first-generation status (FRSTGEN) nor LC enrollment (LCEN) reached significance as a predictor of Spring 2001 GPA. In addition, the adjusted  $R^2$  value for the model explained little ( $R^2_{adj} = .001$ ). (See Table 15.)

Table 15. Effects of First-Generation Status and Learning Community Enrollment on Spring 2001 Mean GPA for Fall 2000 Cohort

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	2.335	3	.778	1.138	.334	.012
Intercept	1847.268	1	1847.268	2700.341	.000	.903
(FRSTGEN)* (LCEN)	1.401	1	1.401	2.048	.153	.007
(FRSTGEN)	1.754	1	1.754	2.564	.110	.009
LCEN	6.878E-03	1	6.878E-03	.010	.920	.000
Error	199.069	291	.684			
Total	2369.215	295				
Corrected Total	201.405	294				

a Computed using alpha = .05

b R Squared = .012 ( $R^2_{adj} = .001$ )



In the Fall 2000 cohort, first-generation students who were not enrolled in learning communities had a slightly higher Spring semester mean GPA ( $x=2.70$ ) than first-generation students who were enrolled in learning communities ( $x=2.54$ ). (See Table 16.)

Table 16. Spring 2001 Mean GPA for Fall 2000 Cohort by First-Generation Status and Learning Community Enrollment

(FRSTGEN)	(LCEN)	Mean	Std. Deviation	N
Yes	Not LC	2.70	.85890	84
No		2.72	.77797	118
Total		2.71	.81056	202
Yes	LC	2.54	.92445	45
No		2.85	.79123	48
Total		2.70	.86818	93
Yes	Yes	2.64	.88201	129
No		2.76	.78197	166
Total		2.71	.82768	295

### Research Hypothesis Three

*Research Hypothesis Three: First-year, first-generation students who enroll in learning communities will achieve different cumulative GPAs in their first two semesters of attendance than will first-year first-generation students who are not enrolled in learning communities.*

LC enrollment was a fixed factor where 0=non-learning community enrollment and 1=learning community enrollment. Individual models were built to address this hypothesis. First-generation status (FRSTGEN) and ethnicity (ETHNR) served as fixed variables. In both

models Fall GPA 1999 and Fall GPA 2000 served as the dependent variables. High school rank (HSRANK) and ACT composite (ACTCMP) functioned as covariates.

Using identical procedures, univariate analysis of covariance models were built to examine the impact of LC enrollment (LCEN) on first-generation students' first semester GPAs for the Fall 1999 and Fall 2000 cohorts. All main effects and two-way interactions were loaded into the initial models. All interactions and main effects that were found to be significant at the alpha level ( $p < .05$ ) were retained for the final model. Interactions and main effects that were not significant were eliminated from the model.

In the overall Fall 1999 model, the interactions of first-generation status (FRSTGEN) \* ethnicity (ETHNR), gender (GEN) \* high school rank (HSRANK), GEN \* ACT composite (ACTCMP), and ethnicity (ETHNR) \* high school rank (HSRANK) were found to be the only significant predictors of GPA. When all variables that had not reached the present significance level of alpha level ( $p < .05$ ) were excluded from the model, first-generation status (FRSTGEN) \* ethnicity (ETHNR) was no longer a significant predictor variable. The adjusted  $R^2$  value for this model was ( $R^2_{adj} = .271$ ). Therefore, an additional step was performed that omitted first-generation status (FRSTGEN) \* ethnicity (ETHNR). The adjusted  $R^2$  value for this model measuring cumulative GPA for the Fall 1999 cohort was ( $R^2_{adj} = .440$ ). This was a substantial improvement over the previous model that included this interaction. Analysis indicated that there was no difference in the first-year mean GPA of first-generation students enrolled in learning communities and those who were not.

Table 17. Significant Factors Influencing the First-Year GPA for the Fall 1999 Cohort

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	86.599	5	17.320	50.148	.000	.449
Intercept	8.986E-02	1	8.986E-02	.260	.610	.001
(GEN)* (HSRANK)	4.095	1	4.095	11.857	.001	.037
(GEN)* (ACTCMP)	9.389	2	4.695	13.593	.000	.081
(ETHNR)* (HSRANK)	2.700	1	2.700	7.817	.006	.025
Error	106.374	308	.345			
Total	2540.450	314				
Corrected Total	192.972	313				

a Computed using alpha = .05

b  $R^2 = .449$  ( $R^2_{adj} = .440$ )

In the overall Fall 2000 model, the interactions of ethnicity (ETHNR) \* high school rank (HSRANK), gender (GEN) \* high school rank (HSRANK), and gender (GEN) \* ACT composite (ACTCMP) were found to be the only significant predictors of GPA. When variables that had not reached the significance level of alpha level ( $p < .05$ ) were obtained from the model, the adjusted  $R^2$  value was ( $R^2_{adj} = .271$ ). Analysis indicated that first-generation students who were not enrolled in learning communities received similar spring semester GPAs as first-generation students who were not enrolled in learning communities; consequently, this interaction was omitted from the model summarized in Table 18.

Table 18. Factors Significantly Influencing the First-Year GPA of the Fall 2000 Cohort

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	49.784	5	9.957	22.088	.000
Intercept	9.288	1	9.288	20.604	.000
(ETHNR)* (HSRANK)	4.437	1	4.437	9.842	.002
(GEN)* (HSRANK)	4.208	1	4.208	9.334	.002
(GEN)* ACT (ACTCMP)	5.087	2	2.544	5.643	.004
Error	125.315	278	.451		
Total	2227.087	284			
Corrected Total	175.100	283			

a Computed using alpha = .05

b  $R^2 = .284$  ( $R^2_{adj} = .271$ )

As learning community enrollment and first-generation status were the primary variables of concern in this study, additional tests were performed to determine if these variables alone explained any of the variance between groups. A univariate analysis of variance model was estimated, which included LC enrollment (LCEN) and first-generation status (FRSTGEN). In the Fall 1999 cohort, first-generation status did not reach significance; however, learning community enrollment did reach significance ( $p < .05$ ) and ( $R^2_{adj} = .012$ ). When first-generation status was omitted from the model the adjusted  $R^2$  value increased slightly ( $R^2_{adj} = .013$ ). (See Table 19).

**Table 19. The Effect of Learning Community Enrollment on First-Year Mean GPA for the Fall 1999 Cohort**

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	3.161	1	3.161	5.382	.021	.015
Intercept	2604.561	1	2604.561	4434.868	.000	.928
LCEN	3.161	1	3.161	5.382	.021	.015
Error	201.441	343	.587			
Total	2806.025	345				
Corrected Total	204.602	344				

a Computed using alpha = .05

b  $R^2 = .015$  ( $R^2_{adj} = .013$ )

Table 20 reflects the mean GPAs of first-generation students in their first year of university attendance for the Fall 1999 cohort. First-generation students who enrolled in learning communities earned slightly higher GPAs ( $x=2.90$ ) than did first-generation students who were not enrolled in learning communities ( $x=2.66$ ). In addition, second-generation students who enrolled in learning communities also obtained higher first-year GPAs ( $x=2.78$ ) than did second-generation students who were not enrolled in learning communities ( $x=2.64$ ). These results must be viewed cautiously, however, as this model explains a minor portion of the variance ( $R^2_{adj} = .013$ ) and does not control for variables which have proven to be stronger predictors of first-year GPAs.

**Table 20. First-Year Mean GPA for the Fall 1999 Cohort by First-Generation Status and Learning Community Enrollment**

(FRSTGEN)	(LCEN)	Mean	Std. Deviation	N
Yes	Not LC	2.66	.69507	70
	LC	2.90	.83770	83
	Total	2.79	.78265	153
No	Not LC	2.64	.73086	108
	LC	2.78	.79743	84
	Total	2.70	.76176	192
Total	Not LC	2.65	.71506	178
	LC	2.84	.81750	167
	Total	2.74	.77122	345

In the Fall 2000 cohort neither LC enrollment (LCEN) nor first-generation status (FRSTGEN) reached the appropriate alpha level of ( $p < .05$ ): therefore, it was concluded that neither was a significant predictor of first-year cumulative GPAs for this group. (See Table 21).

**Table 21. Effects of First-Generation Status and Learning Community Enrollment on First-Year GPA for the Fall 2000 Cohort**

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	1.830	3	.610	1.004	.391	.010
Intercept	1854.751	1	1854.751	3053.490	.000	.912
(FRSTGEN)* LCEN	1.445	1	1.445	2.379	.124	.008
(FRSTGEN)	.575	1	.575	.946	.332	.003
LCEN	.182	1	.182	.300	.584	.001

Table 21. (Continued)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Error	179.796	296	.607			
Total	2344.072	300				
Corrected Total	181.626	299				

a Computed using alpha = .05

b  $R^2 = .010$  ( $R^2_{adj} = .000$ )

Table 22 reflects the mean GPAs of first-generation students in their first year of university attendance for the Fall 2000 cohort. First-generation students who enrolled in learning communities obtained slightly lower GPAs ( $\bar{x}=2.60$ ) than did first-generation students who were not enrolled in learning communities ( $\bar{x}=2.70$ ). However, second-generation students who enrolled in learning communities earned higher first-year GPAs ( $\bar{x}=2.85$ ) than did second-generation students who were not enrolled in learning communities ( $\bar{x}=2.64$ ). Similar to the Fall 1999 cohort, the results for the Fall 2000 cohort must be viewed cautiously, as this model possessed little predictive ability ( $R^2_{adj} = .000$ ) and does not control for variables that have proven to be stronger predictors of first-year GPAs.

Table 22. First-Year GPA for the Fall 2000 Cohort by First-Generation Status and Learning Community Enrollment

(FRSTGEN)	(LCEN)	Mean	Std. Deviation	N
Yes	Not LC	2.70	.75316	84
	LC	2.60	.84313	45
	Total	2.66	.77264	129
No	Not LC	2.65	.80677	122
	LC	2.85	.72029	49

Table 22. (Continued)

(FRSTGEN)	(LCEN)	Mean	Std. Deviation	N
	Total	2.70	.78633	171
Total	Not LC	2.66	.77701	206
	LC	2.72	.78696	94
	Total	2.68	.77939	300

### Research Hypothesis Four

*Research Hypothesis Four: First-year, first-generation students who enroll in learning communities that are course-based and residential will be attain different GPAs in their first year of attendance than will first-generation students who are not enrolled in this type of learning community.*

To measure the impact of LC type (LCTYPE) and first-generation status on the retention rates of the Fall 1999 cohort, cumulative Fall 2000 GPA served as the dependent variable. LC type (LCTYPE) served as a fixed factor and had four levels: 0=not in a learning community, 1=residential and course-based, 2=course-based only, and 3=residential only. First-generation status (FIRSTGEN) served as dichotomous fixed factor where 1= first-generation student status and 3=second-generation students.

Using identical procedures, univariate analysis of covariance models were built to examine the impact of LC type (LCTYPE) on first-generation students' first-year cumulative GPAs for the Fall 1999 and Fall 2000 cohorts. The main effects of LC type (LCTYPE) and first-generation status (FRSTGEN) and the interaction of LC type (LCTYPE) with first-generation status (FRSTGEN) were incorporated into the univariate model. LC\_Type was a



significant predictor of first-year GPA for the fall 1999 cohort ( $p < .05$ ). A Bonferroni post hoc multiple comparison procedure was performed to determine which groups differed. There were significant differences between students enrolled in course-based learning communities as compared to students who were not enrolled in learning communities. However, there were not significant differences between any other groups. Therefore, I concluded that enrollment in course-based and residential learning communities did not result in a significant difference in the GPAs of first-year, first-generation students. Furthermore, this model explained very little of the variance between groups ( $R^2_{adj} = .013$ ), suggesting that other factors better explained differences in GPA between groups. (See Table 23).

Table 23. The Effects of Learning Community Type on First-Year GPA of the Fall 1999 Cohort

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	6.731	7	.962	1.638	.124	.033
Intercept	853.732	1	853.732	1454.013	.000	.812
(LCTYPE)	5.059	3	1.686	2.872	.036	.025
(FRSTGEN)	.200	1	.200	.341	.560	.001
(LCTYPE)* (FRSTGEN)	1.160	3	.387	.659	.578	.006
Error	197.871	337	.587			
Total	2806.025	345				
Corrected Total	204.602	344				

a Computed using alpha = .05

b  $R^2 = .033$  ( $R^2_{adj} = .013$ )

Table 24 reflects the mean GPAs of first-generation students in their first-year of university attendance for the Fall 1999 cohort. First-generation students who enrolled in course-based and residential learning communities obtained slightly lower GPAs ( $x=2.91$ ) than did first-generation students who enrolled in course-based only learning communities ( $x=2.94$ ). They earned higher GPAs than first-generation students who enrolled in residential only learning communities ( $m = 2.69$ ) or students who did not enroll in learning communities ( $x=2.66$ ). Across LC type (LCTYPE) groups, first-generation students who were involved in some type of learning community had higher first year GPAs than did first-generation students who were not enrolled in learning communities.

Table 24. First-Year GPAs by Type of Learning Community for Fall 1999 Cohort

(LCTYPE)	(FRSTGEN)	Mean	Std. Deviation	N
Residential/Course	Yes	2.91	.87860	35
	No	2.62	.71812	43
	Total	2.75	.80141	78
Course-based	Yes	2.94	.81047	39
	No	2.97	.83758	38
	Total	2.96	.81859	77
Residential	Yes	2.69	.85444	9
	No	2.63	1.16568	3
	Total	2.67	.88247	12
Not LC	Yes	2.66	.69507	70
	No	2.64	.73086	108
	Total	2.65	.71506	178
Total	Yes	2.79	.78265	153
	No	2.70	.76176	192
	Total	2.74	.77122	345

Analysis of the 2000 model revealed that neither the main effects of first-generation status (FRSTGEN) or LC type (LCTYPE) nor the interaction of first-generation status (FRSTGEN) \* LC type (LCTYPE) were significant predictors of first-year GPA for the Fall 2000 cohort. (See Table 25). Therefore, I concluded that first-generation students who enrolled in course-based and residential learning communities attained first-year cumulative GPAs similar to first-generation students who enrolled in other types of communities. Furthermore, this model explained very little of the variance. In fact, its ability to predict GPA approached zero ( $R^2_{adj} = -.010$ ). This suggests that other factors better explained differences in GPA between groups.

Table 25. The Effects of First-Generation Status and Learning Community Type for the Fall 2000 Cohort

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	2.517	7	.360	.586	.767
Intercept	681.709	1	681.709	1111.382	.000
(FRSTGEN)* (LCTYPE)	2.033	3	.678	1.105	.347
(FRSTGEN)	.869	1	.869	1.416	.235
LC type (LCTYPE)	.339	3	.113	.184	.907
Error	179.109	292	.613		
Total	2344.072	300			
Corrected Total	181.626	299			

a  $R^2 = .014$  ( $R^2_{adj} = -.010$ )

Table 26 reflects the Fall 2000 cohort mean GPAs of first-generation students in their first year of university attendance. First-generation students who enrolled in course-based and residential learning communities obtained slightly higher GPAs ( $x=2.68$ ) than did first-generation students who enrolled in course-based only learning communities ( $x=2.49$ ) or residential only based learning communities ( $x=2.54$ ). They scored slightly lower GPAs than first-generation students who did not enroll in learning communities ( $x=2.69$ ). In contrast to the Fall 1999 cohort, first-generation students in the Fall 2000 cohort who were not enrolled in learning communities had higher first-year GPAs than did first-generation students who were enrolled in learning communities. Despite the difference in mean GPAs across groups, none of the differences reached the significance level of ( $p < .05$ ).

Table 26. First-Year Mean GPA for the Fall 2000 Cohort by Type of Learning Community

LC type (LCTYPE)	(FRSTGEN)	Mean	Std. Deviation	N
Residential/Course	Yes	2.68	.69108	24
	No	2.80	.72354	32
	Total	2.75	.70609	56
Course-based	Yes	2.49	.99323	17
	No	2.98	.67023	12
	Total	2.69	.89452	29
Residential	Yes	2.54	1.17372	4
	No	2.75	.92505	5
	Total	2.66	.97845	9
Not LC	Yes	2.69	.73516	84
	No	2.64	.80677	122
	Total	2.66	.77701	206

Table 26. (Continued)

LC type (LCTYPE)	(FRSTGEN)	Mean	Std. Deviation	N
Total	Yes	2.66	.77264	129
	No	2.70	.78633	171
	Total	2.68	.77939	300

### Research Hypothesis Five

*Research Hypothesis Five: First-year, first-generation students who enroll in learning communities that are course-based and residential will have different first-year retention rates than will first-generation students who are not enrolled in this type of learning community.*

To measure the impact of LC type (LCTYPE) and first-generation status (FRSTGEN) on the retention rates of the Fall 1999 cohort, retention was coded as a dichotomous variable where the value 0=not retained at Iowa State and the value of 1= retained. This variable describes the students who were retained or not retained from one fall semester to the next. Learning community type had four levels- 0=not in a learning community, 1=residential and course-based, 2=course-based only, and 3=residential only.

A binary logistic regression model was built to determine the degree to which enrollment in particular types of learning communities and non-enrollment in learning communities impacted the retention rates of first-year, first-generation students in their first year of attendance at Iowa State. In the predictor model, Fall 2000 retention served as the dependent variable. High school rank (HSRANK), ACT composite (ACTCMP), gender (SEX\_CD), first-generation status (FRSTGEN) and LC type (LCTYPE) served as covariates.

These variables were incorporated into the logistic regression model designed to measure the impact of type of learning community enrollment on first-year retention rates.

Though LC type (LCTYPE) approached the appropriate level of significance at ( $p=.055$ ) it was not a significant predictor of first-year retention rates for the Fall 1999 cohort. Significance tests revealed that the two significant predictors of first-year retention rates for the Fall 1999 cohort were high school rank (HSRANK) and first-generation status (FRSTGEN) at alpha levels of ( $p=.001$ ) and ( $p=.039$ ) respectively. (See Table 27.)

Table 27. Factors Influencing Retention of Fall 1999 Cohort

	B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 (FRSTGEN)(1)	-.676	.328	4.244	1	.039	.508
(LCTYPE)			4.958	3	.175	
(LCTYPE)(1)	.920	.479	3.687	1	.055	2.509
(LCTYPE)(2)	.614	.435	1.996	1	.158	1.848
(LCTYPE)(3)	.616	1.094	.317	1	.573	1.852
(ACTCMP)	.014	.048	.088	1	.767	1.014
(HSRANK)	.040	.012	12.095	1	.001	1.041
(GEN)(1)	.104	.330	.099	1	.753	1.109
Constant	-1.523	1.059	2.070	1	.150	.218

a Variable(s) entered on step 1: first-generation status (FRSTGEN), LC type (LCTYPE), ACT composite (ACTCMP), high school rank (HSRANK), gender (GEN).

Descriptive statistics revealed that 50 students who enrolled in the Fall Semester 1999 did not return to the university for the Fall Semester 2000. Significantly higher numbers of first-generation students did not return to Iowa State University. To measure the impact of LC type (LCTYPE) and first-generation status (FRSTGEN) on the retention rates of the Fall

1999 cohort. retention was coded as a dichotomous variable where the value 0=not retained and the value of 1= retained. This variable describes the students who were retained or not retained from one fall semester to the next. LC type (LCTYPE) had four levels: 0=not in a learning community, 1=residential and course-based, 2=course-based only, and 3=residential only.

In the prediction model measuring the impact of LC type (LCTYPE) on first-generation students' retention rates of the Fall 2000 cohort, Fall 2001 retention served as the dependent variable. High school rank (HSRANK), ACT composite (ACTCMP), gender (GEN), first-generation status (FRSTGEN), and LC type (LCTYPE) served as covariates. These variables were incorporated into the logistic regression model designed to measure the impact of type of learning community enrollment on first-year retention rates.

In the model measuring the impact of first-generation status (FRSTGEN) and LC type (LCTYPE) on the retention rates of students in their first year of attendance at Iowa State University only, high school rank (HS\_RANK) was a significant predictor of first-year retention rates ( $p=.000$ ).

Table 28. Factors Influencing Retention of Fall 2000 Cohort

	B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 (FRSTGEN)(1)	.305	.318	.919	1	.338	1.357
(LCTYPE)			.519	3	.915	
(LCTYPE)(1)	.164	.396	.172	1	.679	1.178
(LCTYPE)(2)	.246	.576	.182	1	.670	1.278
(LCTYPE)(3)	5.406	11.756	.211	1	.646	222.727
(ACTCMP)	.008	.031	.071	1	.791	1.008

Table 28. (Continued)

	B	S.E.	Wald	df	Sig.	Exp(B)
(HSRANK)	.033	.008	16.157	1	.000	1.034
(GEN)(1)	-.023	.312	.006	1	.941	.977
Constant	-1.156	.833	1.928	1	.165	.315

a Variable(s) entered on step 1: first-generation status (FRSTGEN), LC type (LCTYPE), ACT composite (ACTCMP), high school rank (HSRANK), gender (GEN).

### Summary

Five research hypotheses were tested in this study. The following is a summary of the results of these analyses:

1. Research hypothesis one tested whether first-year, first-generation students who were enrolled in learning communities would achieve different GPAs in their first semester of enrollment than first-generation students who were not enrolled in learning communities. Results of the analysis revealed that neither first-generation status nor learning community enrollment had a significant impact on the first semester GPAs of first-year students. It was concluded that first-generation students enrolled in learning communities had similar first semester GPAs to first-generation students who were not enrolled in learning communities.

2. Research hypothesis two tested whether first-year first-generation students who were enrolled in learning communities would achieve different Spring GPAs than first-generation students who were not enrolled in learning communities. Results of the analysis revealed that neither first-generation status nor learning community enrollment had a significant impact on the Spring semester GPAs of first-year students. It was concluded that



first-generation students enrolled in learning communities had similar Spring semester GPAs to first-generation students who were not enrolled in learning communities.

3. Research hypothesis three tested whether first-year, first-generation students who were enrolled in learning communities would achieve different cumulative GPAs in their two semesters of enrollment than first-generation students who were not enrolled in learning communities. Results of the analysis revealed that neither first-generation status nor learning community enrollment had a significant impact on the cumulative GPAs of first-year students. It was concluded that first-generation students enrolled in learning communities had similar cumulative GPAs to first-generation students who were not enrolled in learning communities.

4. Research hypothesis four tested whether first-year, first generation students who were enrolled in learning communities that are course-based would achieve different cumulative GPAs in their first year of attendance than first-generation students who were enrolled in a different type of learning community. Analysis revealed that neither first-generation status nor learning community type had a significant impact on the first-year GPAs of first-generation students. It was concluded that first-generation students enrolled in course-based and residential learning communities had similar first-year cumulative GPAs to first-generation students who were enrolled in a different type of learning community.

5. Research hypothesis five tested whether first-year, first-generation students who were enrolled in learning communities that were course-based and residential will have different first-year retention rates than first-generation students who were not enrolled in this type of learning community. Analysis revealed that learning community type was not a

significant predictor of first-year retention rates. It was concluded that first-generation students enrolled in course-based and residential learning communities had similar first-year retention rates to first-generation students who were enrolled in a different type of learning community.

## **CHAPTER 5. SUMMARY, CONCLUSIONS, DISCUSSION AND RECOMMENDATIONS**

The purpose of the study was to assess the extent to which enrollment in learning communities predicted the first-year GPA and retention rates of first-generation students enrolled at Iowa State University. This chapter summarizes the results of the research study and presents its implications. This final chapter is organized in five sections: 1) summary, 2) conclusions, 3) discussion, 4) recommendations for practice, and 5) recommendations for future research.

### **Summary**

The research questions that guided this study were: 1) Does learning community enrollment impact academic achievement among first-generation students in their first semester and first year of attendance at a residential university? 2) Does learning community enrollment impact retention rates among first-generation students in the first year of attendance at Iowa State University? 3) Does enrollment in particular types of learning communities impact first-generation students' academic achievement or retention rates?

I employed quantitative research methods to examine data gathered by and obtained from the Cooperative Institutional Research Program (CIRP) Survey, the Iowa State Registrar's Office and the Department of Residence Office of Research and Assessment. Data obtained from two separate cohorts comprised of those students who enrolled and attended Iowa State University during the Fall 1999 and Fall 2000 semesters were analyzed. The data represented all first-time, first-year, first-generation students who responded to the CIRP Survey and resided in a residence hall in the first-semester of their attendance at Iowa

State University. Two random samples of 200 second-generation students were drawn to complete each cohort. In the Fall 1999 cohort there were 170 students who met the first-generation criteria and a total of 370 cases in the analysis. In the Fall 2000 cohort there were 150 first-generation students and a total of 350 cases in the analysis.

Descriptive and inferential statistics were used to analyze the data. Frequencies and percentages were used to describe categorical demographic variables, while means and standard deviations were presented to describe continuous variables.

The researcher employed univariate analysis of covariance, univariate analysis of variance and logistic regression procedures to measure the impact of the fixed factors of learning community enrollment and first-generation status on the dependent variable of GPA. To determine the impact of the fixed factors of learning community type and first-generation status, the researcher employed logistic regression analysis as the statistical technique in this study. Logistic regression procedures regressed retention, the dichotomous dependent variable, onto several predictor variables.

### **Research Hypotheses**

Five research hypotheses framed this inquiry by asking five research hypotheses. The findings related to these were as follows:

#### **Research Hypothesis One**

*First-year, first-generation students who enroll in learning communities will achieve different GPAs in their first semester of enrollment than will first generation students who are not enrolled in learning communities.*

Analysis of covariance models were fitted on the Fall 1999 cohort and the Fall 2000 cohort. Fall semester GPA 1999 and Fall Semester GPA 2000 served as the dependent variables. The independent variables included gender, high school rank, ethnicity and learning community enrollment. All main effects and two-way interactions were incorporated into the model. Main effects and interactions that reached significance were retained for the final model. In neither the Fall 1999 cohort nor the Fall 2000 cohort did either first-generation status or learning community enrollment attain the appropriate level of significance. Therefore, it was concluded that neither first-generation status nor learning community enrollment were significant predictors of first semester GPAs; consequently, they were eliminated from the final analysis of covariance model.

Additional analysis of variance models were estimated to determine the extent to which first-generation status and learning community enrollment explained the variance between groups. The main effects of first-generation status and learning community enrollment and the two-way interaction of first-generation status with learning community enrollment were incorporated into the models.

In the 1999 cohort, with other independent variables omitted, first-generation status was the only significant effect and explained very little of the variance (partial  $\eta^2 = .032$ ). The model estimating the impact of first-generation status and learning community enrollment on Fall semester GPA had an adjusted  $R^2$  value of (.027). In the Fall 2000 cohort, the interaction of first-generation status with learning community enrollment attained significance ( $p < .05$ ) and the  $R^2$  value of (.012). As a result of this finding, an additional model was fitted to determine the predictive ability if the main effects of learning community

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enrollment and first-generation status were eliminated. In that model the interaction of first-generation status with learning community enrollment was no longer significant. Therefore, it was concluded that neither first-generation status nor learning community enrollment significantly predicted first semester GPAs.

### Research Hypothesis Two

*First-year, first-generation students who enroll in learning communities will achieve different Spring semester GPAs in their first semester of enrollment than will first-year, first-generation students who are not enrolled in learning communities.*

Analysis of covariance models were fitted on the Fall 1999 cohort and the Fall 2000 cohort. Spring semester GPA 2000 and Spring semester GPA 2001 served as the dependent variables. The independent variables included gender, high school rank, ethnicity and learning community enrollment. All main effects and two-way interactions were incorporated into the model. Main effects and interactions that reached significance were retained for the final model.

In the Fall 1999 cohort there was a significant interaction between gender and learning community enrollment; however, this interaction was not addressed in the research question. Therefore, no further analysis was conducted. It was concluded that first-generation students enrolled in learning communities had similar GPAs to first-generation students who were not enrolled in learning communities. In the Fall 2000 cohort there was a significant interaction between first-generation status with high school rank and first-generation status with ACT composite; however, neither of these interactions were addressed in the research question. Therefore, no further analysis was conducted. It was concluded that first-generation

students who were enrolled in learning communities had similar spring semester GPAs to first-generation students who were not enrolled in learning communities.

Additional analysis of variance models were estimated to determine the extent to which first-generation status and learning community enrollment explained the variance between groups. The main effects of first-generation status and learning community enrollment and the two-way interaction of first-generation status with learning community enrollment were incorporated into the models.

In the 1999 cohort, neither first-generation status nor learning community enrollment reached significance as predictors of Spring GPA for the Fall 1999 cohort. In addition, the adjusted R squared value of the model that included only these variables was extremely modest ( $R^2_{adj} = .001$ ), suggesting that other variables were better predictors of Spring semester GPA. In the Fall 2000 cohort, neither first-generation status nor learning community enrollment reached significance as predictors of Spring 2001 mean GPA. The adjusted R squared value of the model that included only these variables was extremely modest ( $R^2_{adj} = .001$ ). The adjusted R squared values were identical for both cohorts. Therefore, it was concluded that neither first-generation status nor learning community enrollment were predictors of first-generation students' Spring semester GPAs.

### Research Hypothesis Three

*First-year, first-generation students who enroll in learning communities will achieve a different cumulative mean GPA in their first two semesters of attendance than will first-year, first-generation students who are not enrolled in learning communities.*

Analyses of covariance models were fitted on the Fall 1999 cohort and the Fall 2000 cohort. First-year GPA 2000 and first-year GPA 2001 served as the dependent variables. The independent variables included gender, high school rank, ethnicity and learning community enrollment. All main effects and two-way interactions were incorporated into the model. Main effects and interactions that reached significance were retained for the final model.

In the overall Fall model there was a significant interaction between first-generation status with ethnicity; however, the interaction of first-generation status with ethnicity was not addressed in the research question. Furthermore, when all variables that had not reached significance were omitted, the interaction of first-generation status with ethnicity was no longer a significant contributor and was eliminated from the final model. The adjusted R squared value for the Fall 1999 model including significant interactions was ( $R^2_{adj}=.271$ ). It was concluded that first-generation students enrolled in learning community had similar GPAs to first-generation students who were not enrolled in learning communities. In the Fall 2000 cohort neither first-generation status nor learning community enrollment were significant predictors of first year GPA. It was concluded that first-generation students who were enrolled in learning communities had similar first-year mean GPAs to first-generation students who were not enrolled in learning communities.

Additional analysis of variance models were estimated to determine the extent to which first-generation status and learning community enrollment explained the variance between groups. The main effects of first-generation status and learning community enrollment and the two-way interaction of first-generation status with learning community



enrollment were incorporated into the models.

In the model examining the 1999 cohort, first-generation status did not attain significance as a predictor. In the overall model, learning community enrollment attained significance as a predictor of first year GPA. The adjusted R square value for the overall model was ( $R^2_{adj} = .012$ ). An additional step was performed excluding first-generation status. Learning community enrollment remained significant and the adjusted R squared value increased slightly ( $R^2_{adj}=.013$ ). The model explained little of the difference between groups, suggesting that other variables had more predictive ability. In the Fall 2000 cohort, neither first-generation status nor learning community enrollment reached significance as predictors of Spring 2001 mean GPA. The adjusted R squared value of the model that included these variables was extremely modest ( $R^2_{adj}=000$ ). Therefore, it was concluded that neither first-generation status nor learning community enrollment were predictors of first-generation students' Spring semester GPAs.

#### Research Hypothesis Four

*First-year, first-generation students who enroll in learning communities that are residential and course-based will obtain a different mean GPA in their first year of attendance than will first-generation students who have a different learning community status.*

The independent variables included first-generation status and learning community status - a four level variable where 0=not enrolled in learning community, 1=residential and course-based, 2=course-based learning community, and 3=residential only learning community.

Analyses of covariance models were built to examine the impact of learning

community status on first-generation students' first-year cumulative GPAs for the Fall 1999 and Fall 2000 cohorts. The main effects of learning community status and first-generation status and the interaction of learning community status with first-generation status were incorporated into the univariate model. Main effects and interactions that reached significance were retained for the final model. In the final model for the Fall 1999 cohort, learning community type was a significant predictor of first-year GPA for the Fall 1999 cohort ( $p < .05$ ). A Bonferroni post hoc multiple comparison procedure was performed to determine which groups differed. There were significant differences between students enrolled in course-based learning communities as compared to students who were not enrolled in learning communities. Therefore, I concluded that first-generation students enrolled in course-based and residential learning communities obtained similar GPAs in their first year as compared to first-generation students who were not enrolled in learning community. Furthermore, this model explained very little of the adjusted variance between groups ( $R^2_{adj} = .013$ ), suggesting that other factors better explained differences in GPA between groups.

In the model examining the Fall 2000 cohort neither first-generation status nor learning community type reached significance. Therefore it was concluded that first-generation students who enrolled in course-based and residential communities obtained similar mean GPAs in their first year as compared to first-generation students who were not enrolled in learning communities.

#### Research Hypothesis Five

*First-year, first generation students who enroll in learning communities that are*

*residential and course-based will have different first-year retention rates than will first-generation students who have a different learning community status.*

A binary logistic regression was estimated on the Fall 1999 cohort and the Fall 2000 cohort. The independent variables included first-generation status, learning community status, ACT composite scores, high school rank, and gender. Due to the low number of minority students, ethnicity was omitted from the logistic regressions.

In the logistic regression model of the Fall 1999 cohort, learning community status did not predict retention. First-generation status was a significant predictor when other variables were controlled for. It was not a significant predictor alone when considered independently of other variables. In the logistic regression model of the Fall 2000 cohort, neither learning community type nor first-generation status predicted retention rates.

Based upon the analysis described above, the major findings were as follows:

1. First-generation status did not predict first semester, second semester, or first year GPAs of first-year students.
2. Learning community enrollment did not predict first semester, second semester, or first-year GPAs of first-year students.
3. There was no significant difference in the first-semester, second-semester, and first-year mean GPAs of first-generation students as compared to second-generation students.
4. High school rank was a consist product of the first-semester and first-year mean GPA scores of first-generation students.

5. First-generation status did not significantly predict the retention rates of first-generation students.
6. Learning community type did not significantly predict the retention rates of first-generation students.
7. ACT Composite scores were stronger predictors of mean GPA than were first-generation status or learning community enrollment.

### **Conclusions**

The findings of this investigation hold implications for residence life administrators, university personnel who serve special populations of students, and institutional researchers who assess reform measures designed to enhance students' academic and social adjustment to college. The results indicate that first-generation students at Iowa State University attain similar GPAs and are retained at similar rates in their first year of attendance as second-generation students. Also, this study suggests that in the Fall 1999 cohort, first-generation students who were enrolled in course-based and residential or course-based only learning communities tended to attain higher GPAs than did first-generation students who were not enrolled in learning communities or first-generation students who were enrolled in residential- only learning communities. However, these findings were not similar in the 2000 cohort of students. These results suggest that the findings in this study related to first-generation and learning community enrollment are inconclusive and additional research is necessary. With this population of students, learning community enrollment was not a significant predictor of semester-to-semester mean GPA, first-year mean GPA or of first-year retention rates.

## **Discussion**

This section provides a brief synopsis of what previous research has noted concerning first-generation students in institutions of higher learning and discusses how the findings of this study extend that literature and suggest additional empirical attention that may need to be paid to this population of students. In addition this section discusses the impact learning community enrollment played in the GPA and retention of first-generation students.

### **First Generation Status**

This study revealed that first-generation status was limited in its ability to predict the mean GPAs or the retention rates of students in their first year of attendance at Iowa State University. A sizeable body of research has suggested that first-generation status could indicate that students were at risk for failure at higher education institutions (NCES, 1998). Empirical studies have suggested that because first-generation students were likely to experience less educational motivation and support from family members, come from poorer backgrounds and often possess lower achievement scores, these students typically do not achieve at the same rates as second-generation students (London, et al., 1992; Terenzini, et al., 1996). NCES (1998), which has compiled the most comprehensive data set on first-generation students, found that first-generation students are much less likely than their second-generation counterparts to have either attained a degree or to be enrolled in post-secondary education five years after their initial enrollment.

Though this study does not negate these findings, it does suggest that the importance of first-generation status on GPA and retention in the first year of university attendance may

be less important as an indicator of either success or failure. In this study, the main effect of first-generation status rarely reached significance as predictor of GPA or retention, and when it did, its contribution to the model was modest at best. In only one instance (Fall 1999 cohort) did it reach significance as a predictor of GPA or retention. This finding was not repeated in the Fall 2000 cohort. Other variables had greater ability to consistently predict both GPA and retention rates for the first year of university attendance. The most consistent predictors of GPA in this study were high school rank and ACT composite scores. The most consistent predictor of retention was high school rank. These two variables appeared repeatedly in both the Fall 1999 and Fall 2000 cohorts as predictors of GPA and retention. It seems clear from this study that first-generation status in an environment like Iowa State University is potentially less of a liability than it might be at a different type of institution or an institution serving a different population of students. A possible reason for this might be the tendency of the state's students to score highly on standardized tests. Since the inception of the ACT, Iowa students have consistently scored higher than students from other parts of the country. In 2001, 67% of the graduates took the ACT and earned an average score of 22. This placed Iowa students third on the national chart behind Minnesota and Wisconsin (ACT, 2001). As a result, Iowa students who meet the first-generation criteria may arrive on campus better prepared academically than would first-generation students under consideration in another geographic region of the country. It is likely that this pre-entrance characteristic provides an academic advantage that is not consistent with the findings of other studies that have examined first-generation students. In a similar vein, contrary to other studies on first-generation students, Iowa State does not have disproportionate numbers of

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students who are older, ethnic, or part-time attendees. Iowa State's first-generation students looked remarkably similar to their second-generation counterparts. Due to the residential nature of this university and the lack of commuter and non-traditional students, the students in this study were more likely to be white, between the ages of 18 and 19. Furthermore, these students resided in on-campus residential housing.

### Learning Communities

The results related to the impact of learning community status on first-generation students are mixed, with distinct variations between the Fall 1999 and the Fall 2000 cohort. Though learning community involvement alone rarely rose to the level of significance as a predictor of GPA or retention, in the Fall 1999 cohort there was a consistent pattern of first-generation students who were enrolled in learning communities attaining slightly higher GPAs than first-generation students who were not enrolled in learning communities. In the 1999 cohort, first-generation students who enrolled in learning communities attained a higher Fall semester mean GPA ( $\bar{x}=2.83$ ) than did first-generation students who were not enrolled in learning communities ( $\bar{x}=2.57$ ). This pattern was repeated in the Spring semester where first-generation students who enrolled in learning communities attained a higher mean GPA ( $\bar{x}=2.76$ ) as compared to first-generation students who were not enrolled in learning communities ( $\bar{x}=2.51$ ). As might be expected, the first-year cumulative mean GPA of first-generation students who enrolled in learning communities was higher ( $\bar{x}=2.90$ ) than that for first-generation students who were not enrolled in learning communities ( $\bar{x}=2.66$ ).

In the Spring 2000 cohort the trend of higher mean GPAs for first-generation students enrolled in learning communities was reversed. First-generation students who enrolled in

learning communities attained a slightly lower Fall semester mean GPA ( $x=2.52$ ) than did first-generation students who were not enrolled in learning communities ( $x=2.65$ ). This pattern was repeated in the Spring semester where first-generation students who were enrolled in learning communities attained a lower mean GPA ( $x=2.54$ ) as compared to first-generation students who were enrolled in learning communities ( $x=2.70$ ). The first-year cumulative mean GPA of first-generation students who were enrolled in learning communities was lower ( $x=2.60$ ) than for first-generation students who were not enrolled in learning communities ( $x=2.69$ ). These findings are particularly puzzling as this trend did not hold true for second-generation students who were enrolled in learning communities. In the Fall 2000 cohort, second-generation students enrolled in learning communities had higher Fall semester, Spring semester, and first-year mean GPAs than did second-generation students who were not enrolled in learning communities. One possible explanation for these confounding results might be that the Fall 2000 cohort possessed fewer cases of first-generation students than did the Fall 1999 cohort. As a result, it is possible that poor performance by a few students may have had greater impact on the mean score of the group. Sample size could also have contributed especially in the cases where type of learning community was considered. When first-generation students were divided by type even fewer cases could be analyzed, thus increasing the possibility that poor performance by a few students impacted the group.

These mixed results signal a need to continue the research on first-generation students and the factors that influence their higher education experience. Despite the fact that this group of students possessed similar pre-entrance characteristics to those of their second-



generation counterparts, their performance differed from cohort to cohort. In the Fall 1999 cohort the data suggested that first-generation students benefited academically from their enrollment in learning communities. There was a consistent pattern of these students earning higher semester and first-year GPAs. In the Fall 2000 cohort, the pattern of learning community students receiving higher grades was not repeated.

Further analysis was conducted to ascertain whether type of learning community influenced the GPAs of first-generation students. The results were mixed. There was modest evidence to suggest that certain types of learning communities may have greater academic benefits than others for the Fall 1999 cohort, but a similar result was not found in the Fall 2000 cohort.

In the Fall 1999 cohort, first-generation students who enrolled in residential and course-based learning communities attained a slightly lower first-year mean GPA ( $\bar{X}=2.91$ ) than did first-generation students who enrolled in course-based only learning communities ( $\bar{x}=2.94$ ). These students attained a higher mean GPA than first-generation students who enrolled in residential only learning communities ( $\bar{x}=2.69$ ) or students who did not enroll in learning communities ( $\bar{x}=2.66$ ). There was a significant difference between enrollment in course-based learning communities and non-enrollment in learning communities. Across types, first-generation students who were enrolled in some type of learning community attained a higher first-year mean GPA ( $\bar{x}=2.90$ ) than did first-generation students who were not enrolled in learning communities ( $\bar{x}=2.66$ ). Although these mean GPAs did not attain the level of significance as predictors of first-year GPA, these data do suggest that, for this cohort, enrollment in residential-only learning communities did not have the same academic

benefit as enrollment in course-based or residential and course-based learning communities. It should be noted that the number of students enrolled in residential-only learning communities was small. Only nine first-generation students were enrolled in residential-only communities. As a result, researchers must be cautious about interpreting this finding.

In the Spring 2000 cohort first-generation students who enrolled in course-based and residential learning communities obtained a higher mean GPA ( $x=2.68$ ) than did first-generation students who enrolled in course-based only ( $x=2.49$ ) or residential only learning communities ( $x=2.54$ ). What was most surprising was the finding that first-generation students who were not enrolled in a learning community attained a higher first-year mean GPA ( $x= 2.69$ ) than did first-generation students who were enrolled in course-based ( $x=2.49$ ), course-based and residential ( $x=2.68$ ), and residential-only learning communities ( $x=2.54$ ). These results signal a need for continued study of the impact learning community status plays on first-generation students' academic achievement.

Further analysis was conducted to determine whether learning community type influenced retention rates among first-generation students. Students were sorted into four categories based on learning community status: non-learning community, residential and course-based learning community, course-based only learning community, and residential-only learning community. In neither the Fall 1999 nor the Fall 2000 cohort were there significant differences between groups. In the Fall 1999 cohort, 50 students were not retained into their second year. Twenty-eight of those students met the first-generation criteria and were retained at a significantly lower rate than students of second-generation status. However, type of learning community did not assist in predicting retention rates. In Fall

2000, 58 students were not retained through their second year of enrollment. Twenty-one of those students met the first-generation criteria and were retained at similar rates to second-generation students. Again, type of learning community did not predict retention rates. Thus, I concluded that additional research must be conducted, with a larger data set and over a longer span of time to gain a clearer understanding of the role that type of learning community plays in the retention of first-year students.

### Implications for Practice

Practitioners must continue to assess learning community initiatives. From their inception at Iowa State University in 1995, broad-based assessments have been conducted on learning communities. Typically these assessment endeavors have examined learning community enrollment in the aggregate. Results from such assessments have been positive and have strongly suggested that learning community enrollment increased the retention rates of students and thus contributed to the university's retention rates. Data on whether learning communities increase academic achievement as measured by GPA have been less conclusive, but do suggest that there is merit in this curricular reform. As a result of the assessment efforts, the president permanently funded learning communities on campus.

Unlike previous university studies which have examined the impact of learning community enrollment on first-year retention rates (Doering, 1997. Huba, Epperson 2002), this study suggests that, in the case of first-generation students, impact of learning community enrollment on GPA and retention rates is mixed. In the Fall 1999 cohort, the data suggested that first-generation students who were enrolled in learning communities tended to obtain slightly higher first-year GPAs than their first-generation and second-

generation counterparts who were not enrolled in learning communities. They did not earn significantly higher fall semester, spring semester, or first-year semester GPAs, however. Analysis of the Fall 2000 cohort contradicted this finding. First-generation students who were enrolled in learning communities were more likely to receive slightly lower grades than students who were enrolled in learning communities. Such contradictory findings signal the need for researchers to exercise caution when they design studies and report findings related to learning communities. This study suggested that special populations of students may respond very differently to the learning community treatment than other students. In addition, it suggests that it is important to look at several cohorts of students over a substantial period of time to ensure that the findings are consistent over time.

There is still much to be learned about which models and practices exert the greatest influence on academic and social integration and ultimately student learning. Since the 2000-2001 academic year, the assessment subcommittee of the University Learning Community Committee has begun to examine the impact of learning community enrollment on student learning outcomes. Coordination of learning community research efforts on campus might be a task which falls to this committee. Centralizing the learning community research projects under one committee might serve as an effective way of focusing the inquiry about learning communities' impact on students, faculty, and the university as a whole. Continuing and expanding the research agenda related to student learning potentially holds great promise for informing the knowledge base about the role that learning communities can play in advancing student learning. Practitioners should be encouraged and supported in their efforts to conduct the deep analysis that is necessary to identify the factors that influence the

attainment of educational outcomes. Although the broad-based assessments of large numbers of students should be continued, it is also necessary that the exploration of individual learning communities increase.

Iowa State University personnel take great pride in the grassroots approach that has characterized the rapid rise of learning communities on campus. This approach has resulted in a diverse selection of learning community options. The mixed findings of this study suggest that that impact of learning communities on student achievement and retention may vary based on the practices used by the learning community, the personnel affiliated with the learning community, and the history of the learning community. It may signal the need to define learning communities on campus in a new way. Now that the groundwork has been laid and an infrastructure and resource base established to support the development and growth of these communities; administrators, coordinators, and faculty who facilitate the programs should work collaboratively to develop a common set of goals, objectives and principles that all learning communities share. These standards should be based on empirical research on learning communities and evolve from what is learned through the assessment and evaluation projects that are conducted at the institution.

Once the standards have been developed, a core set of practices should be evident in all learning communities. Learning community coordinators should be able to demonstrate the strategies that are used to address each standard. Learning communities would maintain their individuality and could expand upon the core set of principles, but a learning community would be defined based upon the core set of principles that they share with other communities. After these principles are determined, they should be clearly communicated so

that those involved in the learning community have a clearer sense of the desired outcomes of the learning community, the strategies that will be used to reach those outcomes and a deeper understanding of the role one will play and the options that exist to impact student learning.

The intent of this recommendation is not to stifle the individuality of each learning community, but to increase the likelihood that practices and principles that are shown to support academic achievement are present in each learning community.

Over 90 percent of the first-year full-time students at Iowa State University reside in residence halls and over half of the 47 university-recognized learning communities are residential in nature. As a result, special attention should be paid to the development of living environments that are supportive of student success. This study suggests that residential only learning communities based on academic interest alone did not impact academic achievement or retention rates of first-generation students, and supports the findings of Elton and Bate (1966) and McKelfresh (1980) who found that students assigned by academic major did not perform better academically than students who were assigned at random. One of the unifying characteristics of learning communities is that they attempt to extend the learning beyond the classroom. Due to the high percentage of first-year students in residence, it would be prudent to continue to explore in which ways residential structures and residential personnel can support the learning objectives and outcomes of the university. Residential personnel and their academic partners must work collaboratively to identify and practice the strategies that successfully enhance in-class and out-of-class learning and influence academic achievement. This study suggests that assigning students solely by academic interest will not accomplish this goal.

Flansburgh (1991) noted that student residential environments should be developed in ways that enhance the quality of the learning experience. For example, computer technology makes it possible for students to engage in conversations about common classes, and collaborate on class assignments. Residence life operations of the future should be designed with an awareness of students' needs and an understanding of the educational outcomes that can be met through technology and a living facility equipped to support students' technological needs. Whitt and Nuss (1994) noted that room, floor, and hall assignments that group students in common classes provide increased opportunities to link programs and purposes with residential education. Residence life staff should work with coordinators and faculty associated with learning communities and become more intentional in designing environments and promoting programs that strengthen the bond between in-class and out-of-class experiences and provide students with opportunities to develop common intellectual tasks.

Since 1997 the Iowa State University Department of Residence has been engaged in a substantial renovation project that will transform the living environments for students. By the fall of 2003 all entering first-year students will be housed in the two geographic areas that are the closest to the core of the campus. In addition, students living in residence halls will be required to participate in personal development activities, leadership opportunities, and community service activities. At present students have discretion in determining what the nature of their required activity will be. Research has shown (Pascarella, Terenzini, 1991) that there is a clear benefit in integrating students' out-of-class experience with their in-class learning; however, it has also been shown that many of the educational outcomes occur more

by default than by design (Pascarella, Terenzini, 1991). Residence life staff can be more intentional about helping students to integrate their experiences and thus become more successful in meeting education goals. Community service, personal development, and leadership objectives should be linked to curricular goals of the learning community wherever possible. Learning community coordinators, residence life staff, and student participants should form collaborative teams that design and implement programs and activities that assist students to reach their curricular and developmental goals.

This study signals the need for student affairs and academic affairs to be more intentional about the structures and programs which support student out-of-class learning. A disappointing finding was that residential-only learning communities seemed to have little impact on the academic standing of students. The only significant finding related to type of learning community occurred in Fall 1999 cohort and suggested that students enrolled in course-based learning communities had significantly higher year-end GPAs than students who were not enrolled in learning communities. This indicates that it may be possible to further enhance the out-of-class learning that can occur in residence halls.

Research informs us that to maximize the learning opportunities available in residential settings, departments of residence must continue to evolve and strive to create a new model for student involvement. Capitalizing on the shared academic interests of learning community students is a necessary step in this process. As Komives (1994) noted, focusing on empowerment and grassroots, bottom-up student participation is critical to transforming the more traditional models that are hierarchical and controlling in nature. To meet this challenge, staff must be willing to create authentic relationships with students. In



such a model, students are encouraged to become agents in their educational experiences and not solely participants in experiences designed by others. Meeting this goal will entail re-conceptualizing, re-designing, and retraining residence life paraprofessional and professional staff.

Levine (1994) suggested that the principal educators of students are students. If this assertion is true, then residence hall staff must reconsider their role and become more intentional about engaging in practices that encourage and influence student learning. In light of this concept, residence life staff might begin to consider themselves as facilitators of learning, especially in environments where students have been grouped by academic interests. Residence life administrators might want to make placement decisions based on the resident assistants' academic interests and whether they align with the academic interests of the students in the learning community. Resident assistants and hall directors who work in halls that serve learning community students might meet weekly with learning community coordinators and determine the out-of-class curriculum that would enhance the learning outcomes deemed important. In addition, new staff positions might be created to serve the needs of learning community students and to aid them in integrating their in-class and out-of-class experience.

#### Recommendations for Future Research

Although this study provides an additional perspective on the subject of first-generation students and their adjustment to college, it had several limitations that future researchers might want to address as they expand the knowledge base concerning the areas of first-generation status and learning communities. This study was limited in that it looked

only at first-generation students in their first year of university enrollment. Future researchers may want to consider following a cohort of students through two or possibly four years of enrollment to determine if different findings result. Tinto and others have suggested that, although decisions about whether to remain or depart from an institution may be made early on in a student's career, the actual act of withdrawal may occur much later in the student's matriculation. As Tinto (1994) indicated, of the nearly 2.4 million students newly enrolled in institutions of higher education each year, 1.5 million will leave their first institution without receiving a degree. Approximately 1.1 million will leave higher education altogether, without completing a two- or four-year degree program. Tinto's (1994) findings suggest that examining the first year of university experience, although a valuable undertaking, may be limited in its ability to fully describe the factors that influence departure decisions.

The research on first-generation students and their adjustment to college should continue for several reasons. Researchers have not agreed upon a commonly-held definition of first-generation status (Billson & Terry, 1982; York-Anderson & Bowman, 1991). Researchers' inability to agree upon a definition has made it difficult to draw meaningful conclusions from the quantitative studies that have been conducted on this topic.

The National Center of Education Statistics data (1998) indicates that first-generation students are more likely to be older, Hispanic or ethnic, and enter higher education institutions with a history of lower academic achievement. These characteristics did not define the sample cohort groups at Iowa State University. First-generation students in this study were very similar to their second-generation counterparts and their academic

achievement prior to entering the university and their performance while in the institution rivaled, and in some instances, exceeded, the performance of second-generation students. It is likely that other campuses' first-generation students also may deviate from the commonly-held standard. This is an aspect of "first-generation" students that has not been presented in the literature heretofore. In this researcher's opinion it calls into question the general assumption that first-generation students are at risk in institutions of higher education. This study revealed that not only did first-generation status have little ability to predict academic achievement or retention, but also that some of the previously held notions of this population of students may need to be challenged by future researchers.

In relation to this issue, accurately defining first-generation status becomes imperative. In fact, it suggests that the term, first-generation, may need to be not only defomed operationally, but applied consistently across studies. As future researchers evaluate this population they need to pay closer attention to the various subgroups that bear the first-generation label. Within-group differences based on ethnicity, gender, age, and geographic region should be considered. Are first-generation students in a homogenous environment like Iowa similar to first-generation students in a more ethnically diverse environment like Florida? Are different educational responses to this population required as a result? It is questions of this nature that future researchers will need to address.

Gose (1996), in a *Chronicle of Higher Education* article, emphasized the importance of additional studies on first-generation students. As affirmative action policies are challenged in the nation's courts, institutions like Tennessee Technology University and the University of Colorado at Boulder have begun first-generation scholarships to increase their

number of students from underrepresented groups. Though this strategy may be effective in areas where first-generation students meet the traditional definition criteria, institutions should be cautious about adopting this approach as a solution to affirmative action challenges or race-based recruitment initiatives. Future research on this topic could inform administrators on whether this approach enables them to meet their enrollment initiatives and is a prudent course of action.

This study also signals the need to continue the research on learning communities. As Gabelnick and others (1990) have noted, one of the strongest selling points concerning learning communities is their impressive record in retaining students. Although learning community enrollment was not a predictor of retention in this study, others have documented that students enrolled in various types of learning communities are retained at rates consistently and substantially higher than freshmen in general. It is believed that higher retention rates in learning communities are a direct result of the tendency of students in learning communities to share several courses in common. As Tinto (1994), Astin (1984) and others have contended, increasing the level of involvement of students in the academic and social fabric of institution enhances students' likelihood for success. As institutions across the country look for innovative practices that aid students, researchers must engage in deep analysis of this method of curricular reform. Shapiro and Levine (1999) in their text, *Creating Learning Communities: A Practical Guide to Winning Support, Organizing for Change and Implementing Programs*, underscored the need for future researchers to spend the necessary time to examine learning communities effectively. Educational reformers must be sure that the positive results that have been documented are the result of a Hawthorne

effect. As Bower (1997) noted, research will be necessary to determine if the positive effects remain, even as the “specialness” of this reform measure diminishes.

In addition to establishing empirically whether learning communities do impact academic achievement or retention rates, it is incumbent on future scholars to determine why and how they work. If academic and social integration are at the heart of the interactionist theory, it will be important to know more about how these principles, in fact, can be enhanced for students who are enrolled in learning communities. Further empirical tests of these theories of integration would inform the practice of educators in university settings.

Researchers will want to know not only which models work best, but whether special adaptations to those models should be made based on the institutional culture, the client being served, the expertise of the faculty and the resource base that is available to support these initiatives. This present study defined learning community type as a four-level variable in an effort to determine whether there were differences within groups and between groups of students. The evidence on this was inconclusive and varied from semester to semester. Further study should be conducted on learning community models such as the federated model and the coordinated model. It is possible that due to the increased curricular linkage, the team approach to instruction, and collaborative pedagogy practices that seek to involve students as agents of learning, models of this nature may promote greater learning and academic achievement and increased retention rates for many students.

Throughout their history, North American institutions of higher learning have served an array of students. It is possible that as colleges and universities begin their progress into the new millennium, the challenge to educate a public that grows increasingly diverse and to

persuade a public that grows increasingly disillusioned will compel these institutions to reflect deeply and move decisively to address the educational needs of our society and world. These institutions have always served some students well, the question today is whether they can serve all students better.

**APPENDIX A. DESCRIPTIVE STATISTICS OF FALL 1999 COHORT  
WITH ACT COMPOSITE AND HIGH SCHOOL RANK**

Learning Community Enrollment	N	Percentage
<b>First-Generation</b>		
Not learning community	82	48.2
Residential and course	37	21.8
Course-based only	42	24.7
Residential only	9	5.3
Total	170	100.0
<b>Second-Generation</b>		
Not learning community	114	57.0
Residential and course	43	21.5
Course-based	40	20.0
Residential-only	3	1.5
Total	200	100.0
Ethnicity	N	Percentage
<b>First-Generation</b>		
Not White	13	7.6
White	154	90.6
Total	167	98.2
Missing	3	1.8
Total	170	100.0
<b>Second-Generation</b>		
Not White	15	7.5
White	164	82.0
Total	179	89.5
Missing	21	10.5
Total	200	100.0
Gender	N	Percentage
<b>First-Generation</b>		
Female	95	55.9
Male	75	44.1
Total	170	100.0
<b>Second-Generation</b>		
Female	92	46.0
Male	108	54.0
Total	200	100.0

**APPENDIX B. FALL 1999 COHORT ACT AND HIGH SCHOOL RANK**

<b>First-Generation Status</b>	<b>ACT Composite Scores</b>
Yes	24.69
No	24.68
Total	24.68



**APPENDIX C. DESCRIPTIVE STATISTICS OF FALL 2000 COHORT  
WITH ACT COMPOSITE AND HIGH SCHOOL RANK**

Learning Community Enrollment	N	Percentage
<b>First-Generation</b>		
Not learning community	97	66.0
Residential and course	28	19.0
Course-based	18	12.2
Residential only	4	2.7
Total	147	100.0
<b>Second-Generation</b>		
Not learning community	145	72.5
Residential and course	35	17.5
Course-based	15	7.5
Residential only	5	2.5
Total	200	100.0
Ethnicity	N	Percentage
<b>First-Generation</b>		
Not White	25	17.0
White	120	81.6
Total	145	98.6
Missing	2	1.4
Total	147	100.0
<b>Second-Generation</b>		
Not White	12	6.0
White	168	84.0
Total	180	90.0
Missing	20	10.0
Total	200	100.0
Gender	N	Percentage
<b>First-Generation</b>		
Female	92	62.6
Male	55	37.4
Total	147	100.0
<b>Second-Generation</b>		
Female	89	44.5
Male	111	55.5
Total	200	100.0

**APPENDIX D. FALL 2000 COHORT ACT AND HIGH SCHOOL RANK**

First-Generation Status	ACT Composite Scores	High School Rank
Yes	23.52	75.63
No	24.22	73.29
Total	23.92	74.28

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