A STATISTICAL ANALYSIS OF THE IMPACT OF PARTICIPATION IN LIVING-LEARNING COMMUNITIES ON ACADEMIC PERFORMANCE AND PERSISTENCE

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A STATISTICAL ANALYSIS OF THE IMPACT OF PARTICIPATION IN
LIVING-LEARNING COMMUNITIES ON ACADEMIC
PERFORMANCE AND PERSISTENCE

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Dissertation

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ABSTRACT

This study sought to determine if participation in the living-learning communities at a large, Midwestern, urban institution in 2004, 2005, and 2006 had an impact on performance and retention through the college career by yielding differences in academic performance and persistence measures. This study sought to broadly determine, when considering academic year and controlling for entering ability, whether there is a statistically significant difference, on average, in the fifth year of academic performance and retention rates of living-learning community participants, learning community participants, traditional curriculum resident students, and traditional commuter students.

When considering persistence as measured by cumulative credits earned and academic performance as measured by grade point average, analysis of variance (ANOVA) was used to identify statistically significant differences between groups when considering academic year. Analysis of covariance (ANCOVA) was conducted to assess these differences when considering academic year and controlling for entering ability measures of high school GPA and ACT score. ANOVA results indicated differences in credits earned and cumulative grade point average between curriculum types. In each instance, living-learning communities exceeded all other groups. ANCOVA results indicated that there were statistically significant differences, on average, between groups for credits earned and cumulative grade point average when controlling for entering
ability variables. Of interest, results identified adjusted means of cumulative grade point average for living-learning communities and residents as being near equivalents.

Unique to the study, was the focus on analysis after five years of study, assessing the longitudinal impact associated with participation in living-learning communities. Results identified that the interaction between year and curriculum type were not significant, indicating that there was not a statistically significant difference among the students’ grades and credits earned across the three years of the study. Achievement patterns did not differ by year, reflecting living-learning communities earned higher scores in each cohort and showed that curriculum type served as the only significant factor in the analysis. The study adds breadth and depth to institutional approaches to assessing programs which impact both academic performance and persistence as measures of academic success.
DEDICATION

For the two smartest people I know, my mother and father

and for my darling Ava.
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CHAPTER I
INTRODUCTION

Over the past two decades, colleges and universities faced increased calls for accountability in meeting educational purposes and helping students obtain educational goals. With indicators of poor student retention, declining academic performance, and shifts in student satisfaction, institutions identified means of reforming the learning experience to achieve student success (Bleed, 1999). The research of Tinto (1999) and Astin (1993) present theories suggesting that increased student engagement supports student success. Following their theoretical framework, one popular structure, the learning community, gained support in institutional use for its promotion of engagement and success. The living-learning community evolved as a hybrid of the academic learning community and the on-campus residential environment, capitalizing on the advantages each provides toward engagement and success.

Learning communities support success outcomes by partnering the co-curricular experience within the academic context to promote deeper learning of academic content while engaging students and their peers in learning processes (Shapiro & Levine, 1999). Supporting student engagement, findings suggest that residence hall environments provide a supportive environment to promote interactions which enhance student sense of belonging and involvement, particularly in the first year of study. They provide environments for informal learning and support. Taken together, the suggested
advantages of involvement as evidenced in the learning community and residing on campus have yielded the evolution of the living-learning community.

The living-learning community is the merger of the living environment around a central theme to promote involvement, engagement, and student success. Unlike the common residential experience, the living-learning community embeds the academic curriculum within the co-curricular environment. A growing body of research has emerged examining the outcomes associated with participation in living-learning programs. Much of this research focused on the success measures – academic performance and persistence – during the first year of study. It is the purpose of this study to specifically explore the impact of participation in a living-learning community beyond the first year of study and specifically explore any impact which may evidence after five years of study.

Overview of Research and Theory

In 1994, the American College Personnel Association (ACPA) published The Student Learning Imperative. This document set the tone for the work of academic and student affairs for the new millennium. It stressed the importance of linking students’ in-class and out-of-class experiences to create seamless learning environments focused on student learning and academic success by promoting educationally purposeful activities. The report suggested that experiences in various in-class and out-of-class settings contribute to learning and personal development. It further suggested that benefits are more likely to be realized under certain conditions, such as active engagement and collaboration with faculty and peers on learning tasks. Finally, the report recommended
that colleges and universities attempt to make connections between what are often perceived by students to be isolated experiences by bridging organization boundaries and forming collaborative partnerships with faculty and others to enhance student learning (American College Personnel Association, 1994).

A number of researchers developed theories related to those concepts supported by *The Student Learning Imperative*. Tinto’s (1986) theory of student departure examines persistence in the context of the students’ experiences during college. Tinto developed a model of attrition using integration and commitment to represent shared values and support. According to Tinto, persistence is a function of integration into the academic and social aspects of college life. Academic and social integration lead to commitment, which leads to persistence. Tinto argued that college students go through a process of separation, transition, and incorporation. Those students who fail to complete these processes are more likely to withdraw from college.

According to Tinto (1986), the freshman year is of particular importance in fostering the processes that are conducive to retention. The majority of all institutional attrition occurs during the first year and prior to the beginning of the second year. The extent to which students are integrated into the academic and social areas of the educational community during their first critical year of study influences their level of commitment, which then influences the likelihood that they will remain (Tinto, 1993).

Consistent with Tinto, a number of researchers identified connections between engagement, integration, and student success. Astin (1993) concluded that student learning and intellectual development are influenced by a variety of factors, including coursework, effort in studying, involvement in out-of-class activities, and interaction with
faculty and peers. Chickering (1975) concluded that student learning requires both integration and differentiation with academic environments which are supported by strong out-of classroom experiences. Frequent and rewarding interactions between students and faculty in and outside of the classroom may then, directly or indirectly result in persistence as well as social and intellectual development (Arrison, 1996). Pike, Schroeder, and Berry (1997) also found that academic and social integration, faculty-student interaction, and peer support exert significant effects on achievement and commitment. To this end, the challenge assumed by higher education remains to design structures that support such educational opportunities.

According to Pascarella and Terenzini (1998), many studies on retention are based upon the traditional view of students rather than changing dynamics of the university environment. In looking to assess student success broadly, persistence and academic performance as measured by credit hours completed and by grade point average respectively, have been utilized as the primary point of analysis by a number of studies. In addition, student background characteristics including high school grade point average, entrance examination score, and levels of engagement were found to be significantly related to their grades in college. Grades are intrinsically tied to whether students will persist and graduate (Pike, Kuh, & Massa-McKinley, 2008). As such, a relationship has been suggested between background characteristics and student performance.

Given these accepted measures of success and the framework to support it through engagement, institutions are now challenged to create situations for ample opportunities for student involvement in meaningful outside of class activities (Kuh, Douglas, Lund, & Ramin-Gyurnek, 1994). Tinto’s (1986) theories of student departure
and Astin’s (1993) idea of involvement point to the need for the integration of students’ social and academic lives to improve academic success and retention and suggest the power of learning communities to support student persistence (Talburt & Boyles, 2005). Learning communities have emerged to effect such a change. The learning community represents a change from the traditions of the historic research university because it systematically and structurally alters the curriculum and the setting of teaching and learning. It provides linkages between curricular content, the social environment and engenders and network of peer and faculty support (Klein, 2000).

The learning community format is intended to remove obstacles to effective teaching and learning by placing greater emphasis upon collaborative learning and by increasing student-faculty interaction and interdisciplinary connections (Romanoff, 2000). Learning communities break students and faculty into groups that tend to be smaller than other units on campus. They encourage integration of the curriculum that allows faculty to teach and students to learn in a more interdisciplinary manner. They help students establish academic and social support networks inside and outside the classroom. They provide a setting for students to become socialized as to what it means to be a college student (Shapiro & Levine, 1999). Learning communities help students link their academic work through active and increased intellectual interaction with each other and the faculty, content linked courses and cohort approaches to learning (Kellogg, 1999). There has been a wide range of studies regarding learning community’s outcomes. Pike (1999) found that students in learning communities had significantly higher levels of involvement, interaction, integration and gains in learning and intellectual development than did traditional students. The study found that participation in learning communities
directly enhanced students’ involvement and interaction and indirectly promoted integration and gains. Learning communities support integration in classes and amongst course topics.

Researchers (Gabelnick, MacGregor, Matthews, & Smith, 1990; Johnson & Romanoff, 1999; Shapiro & Levine, 1999) suggest that student retention in learning communities is high because students feel they are active participants in their education. They can confront each other, create meaning jointly with other students and faculty, and discover and experience how group work deepens individual insight that can translate into other community efforts breaking down the idea of learning alone, being alone, teaching alone (Gabelnick et al., 1990). Research on student participation in learning communities confirms these suggestions by identifying a positive impact on persistence to the second year of study and completion of credit hours at a higher rate than non-participating peers after considering entering ability (Sidle & McReynolds, 2009).

The residential environment provides a unique complement to the learning community. The living-learning or residential learning community merges the collective classroom experience to students’ on-campus living environment. The residence hall environment provides a bridge for learning communities and the co-curricular experience. Studies of residence hall students have linked the residential environment to student success, persistence, and academic performance; residence hall students have been found to demonstrate higher levels of satisfaction, earn higher grades, and persist at higher levels than their commuter peer counterparts (Schein, 2005; Schroeder & Mable, 1994).
By their general structure, the residence hall provides a collaborative living environment in which students are clustered in smaller groups with common living arrangements. At the core of the residential environment are students interacting with their peers in a communal setting. As a collective, they establish group norms and share common experiences like adapting to roommates, exchanging peer ideas about morals and ethics, establishing identity in the absence of parental supervision, and exploring identity in a diverse environment. The residential community provides an immediate group identity which can be enhanced by curricular and co-curricular activities. Coordinated community activities and structured opportunities for engagement allow students to interact on formal and informal levels which can be closely linked to those experiences and topics within the classroom (Inkelas & Weisman, 2003).

Pascarella and Inman (1998) conducted a review of the body of research that documents the role of student residence on a number of outcomes including values, esteem, independence, moral judgment and persistence, and degree attainment. In these studies, differences between residents and commuters in such areas held solid when controlling for high school achievement, and findings suggest that residential environments may be a factor that exceeds various background variables (Pascarella & Inman, 1998). This study also found living on campus is also significantly and positively associated with persistence even when precollege factors such as high school grades are considered (Pascarella & Inman, 1998). To this end, the university residential environment may positively impact the student experience.

Tinto’s (1993) emphasis on the interaction between the individual students and various campus communities suggest that residence hall experiences provide frameworks
to enhance persistence. Research on residential status and academic and social integration, as tied to Tinto’s work, indicates that resident students tend to participate in on-campus activities at higher levels than non-residents, and therefore levels of such involvement may influence student engagement, commitment, and persistence (Pascarella & Inman, 1998). McCluskey-Titus and Oliver (2001) mirrored Tinto’s and Astin’s position when they reported that the data suggest that students who live in residence halls feel a sense of belonging; have people interested in their intellectual development; have well developed relationships with peers on their floor; and achieve higher grades. Students with a strong sense of community in campus environments like residence halls are more likely to be fully connected or more integrated into the campus (Berger, 1997; McCluskey-Titus & Oliver, 2001). Berger’s (1997) study confirmed that the strong connection between peer relations and community emphasized the connection with the residence halls and the development of the student’s involvement on campus. Findings concluded that the residential communities serve as a successful bridge between the student and the overall normative environment on campus, providing a framework for their engagement with faculty and their satisfaction with the institution. This is the same type of engagement Tinto and Astin suggest as supportive of persistence and academic success.

The merger of learning community and the residential environment as the living-learning community can support and complement the academic integration created through linked courses or topical areas. The residential learning community provides students a common living environment, peer interaction, peer mentors, co-curricular activities, opportunities for academic and social support, and sense of group identity.
These, when combined with the shared goals and common tasks of an academic theme, interest or cohort, provide for community-based systems of accountability and achievement.

Astin's (1993) involvement model and Tinto’s (1986) departure model provide theoretical and conceptual reasons why living-learning communities should impact college students positively. These models suggest that living-learning communities should increase student development, achievement, and persistence through encouraging integration of the social and academic (Lenning & Ebbers, 1999). Since their rise in popularity more than 15 years ago, outcomes of living-learning programs have been studied extensively. In a study of the effects of residential learning communities on persistence, Pike et al. (1997) found that students in living-learning communities reported substantially higher levels of involvement and interaction than traditional students. Higher persistence rates for residential learning community students were a product of greater involvement and interaction. It also reported that the relationships between college experiences and persistence were different for students in these communities than in traditional environments. Specifically, peer interaction and support had a stronger effect on persistence in living-learning community students than for non-residential learning communities or traditional students.

Living-learning communities have been associated with gains in critical thinking, cognitive development, strong peer interactions and more frequent interactions with faculty than traditional residential environments. Broadly speaking, living-learning participants are noted for higher levels of involvement and interaction and serve as drivers for opportunities to foster engagement and commitment (Garrett & Zabriskie,
Students participating in these programs have reported greater gains in their own education (Pike, 1999). Residential learning communities broadly have been found to be associated with higher academic performance, higher retention, greater university satisfaction, greater levels of student engagement, and increased perception of student learning (Stassen, 2003). These findings suggest that participation in such communities support the involvement and engagement identified as supportive of student success.

Findings associated with living-learning communities have yielded outcomes including impact upon academic performance and persistence for first year students in their transition to second term and sophomore year of study. Living-learning communities can be structured in a wide array of formats with student living environments closely linked to coursework to broadly themed living-learning communities focusing on a general academic theme. Although the design and curricular intensity of such programs have drawn outcomes into question, Shushok and Siriam (2010) found that the collaborative natures of living-learning communities, regardless of design or academic component, with peer interaction as a primary driver, yielded positive outcomes and these outcomes were associated regardless of major, courses of study, or program design. Similarly, Soldner and Szeleny (2008) found that both breadth and depth exist amongst the variety of formats and structures of living-learning programs conducted at colleges and universities nationwide, and identified an evolving definition of living-learning programs as those which broadly comprised undergraduate participants living together around a centrally derived theme. Regardless of format, positive outcomes have been associated with living-learning communities during the first year of study.
The vast majority of studies on both learning communities and living-learning communities focus outcome measures on the first year successes of participants. Specifically, primary consideration is given to first term or first year persistence and academic performance measures. Few studies consider the long-term impact of participation in living-learning programs through graduation. Few studies assess the impact of participation in a living-learning community on persistence to graduation and overall undergraduate academic performance. The lens of focus has been primarily on the first year of study- and while significant, little exploration has occurred beyond the first year.

Several recent studies have explored outcomes beyond the first year. White and Turbeville (2005) studied first year outcomes of participants in a living-learning program; finding significant gains in academic performance and persistence, and also reviewed, the long-term success of the cohort five years after participation in the living-learning community. They found that participants graduated at a 10% higher rate than non-participants and earned higher grade point averages than non-participants. Similarly, Buch and Spaulding (2008) found that mean grade point average was higher for learning community participants during the first year, but did not find the same effects beyond the first year of study. Waldron and Yungbluth (2007) concluded that although longitudinal studies of learning communities are rare, indicators they found suggest these programs support success for some kinds of students. They found that minority students with historically higher dropout rates showed modest success in both persistence and academic performance than non-participants after two years of study. They found that even slight increases over time supported program intent of success. Inkelas (2008) concluded that
although increasing in numbers, living-learning programs have not kept pace in their methods of assessment and that research continues to grow on the benefits of participation beyond the first year of study.

**Purpose of This Study**

In the fall of 2004 a large, urban, open-access Midwestern university piloted six new living-learning communities in effort to support student persistence and performance. The pilot study was designed to provide opportunities for enhanced success for participants. After the initial year, the living-learning communities were continued and expanded in following academic years 2005 and 2006. The living-learning communities were varied in theme and content blending the spectrum of opportunities for the living-learning community. Some programs involved students who were enrolled together in a series of linked or integrated courses and resided together on a residential floor where the residence hall environment was intended to support the classroom experience, creating informal opportunities for study, advisement, and faculty engagement. Others were centered on student enrollment in a single seminar designed around a theme; this theme carried to activities provided on the floor. The remaining were interest groups drawing on a central theme or interest with intentional co-curricular experiences provided around that theme. Each provided a living environment to support learning experiences, peer mentors, and advisor interventions outside of the classroom. While varying in structure and composition, it is suggested that participation in the living-learning community provided an advantage to students over participants in non-
residentially-based learning communities, non-participating resident students, and non-participating commuter students.

In the pilot and following years, enrollment in the living-learning community was contingent upon the time at which the students completed their initial orientation at the university. Students were provided the opportunity to select involvement in living-learning communities through their enrollment process at new student orientation. Students in select academic programs were provided the option to enroll in these courses as a function of the traditional course enrollment process. Opportunity to enroll may have been limited by course of study or availability of space in such programs at the time of enrollment. All living-learning communities included a theme-based seminar. Students were afforded the opportunity to enroll, and submit a letter of intent for approval for admission to the program. During the first year, none were denied admission to the program.

It was the purpose of this study to explore the differences among these groups five years after participation in the living-learning community for 2004, 2005, and 2006 academic years to identify differences in persistence and academic performance while controlling for entering ability.

**Research Questions**

This study sought to determine if participation in the pilot year of living-learning communities at a large, Midwestern, urban institution in 2004, 2005, and 2006 had an impact on performance and retention throughout the college career by yielding difference in academic performance and persistence measures. The study sought to broadly
determine, when considering academic year and controlling for entering ability, whether there is a statistically significant difference, on average, in the fifth year of academic performance and retention rates of living-learning community participants, learning community participants, traditional curriculum resident students and traditional commuter students. The study sought to answer:

- For the classes of 2004, 2005, and 2006, does cumulative grade point average differ among living-learning community participants, learning community participants, traditional curriculum resident students and traditional curriculum commuter students after five years of study when considering academic year and controlling for high school grade point average and ACT score?

- For the classes of 2004, 2005, and 2006, do cumulative credits earned differ among living-learning community participants, learning community participants, traditional curriculum resident students and traditional curriculum commuter students after five years of study when considering academic year and controlling for high school grade point average and ACT score?

The purpose of this study was to analyze the outcomes associated with four different types of curricular structures beyond the first year of study. Living-learning communities, learning communities, and residential status have been shown to have an impact upon student success during the first year of study. Differences in academic year cohort performance were considered in the analysis. Cumulative grade point average and cumulative credits earned served as measures of student success in this study. Pre-college
attributes of high school grade point average and ACT score have been identified as predictors of college success and were therefore controlled in the analysis. Given these variables, the selected approaches were two-way analysis of variance (ANOVA) and two-way analysis of covariance (ANCOVA) and are discussed in detail in Chapter III. Data were provided by institutional records regarding student performance, program participation and pre-college attributes and analyzed utilizing analysis of variance (ANOVA) and analysis of covariance (ANCOVA). A Statistical Package for Social Sciences (SPSS) software was utilized to infer impact on participation amongst the four groups to test the following hypothesis:

**Research Hypotheses**

Research Hypothesis 1: There is a statistically significant difference, on average, in cumulative grade point average among living-learning community participants, learning community participants, traditional curriculum resident students, and traditional curriculum commuter students after five years of study when considering academic year and controlling for entering ability as measured by high school grade point average and ACT score.

Research Hypothesis 2: There is a statistically significant difference, on average, in cumulative credits earned among living-learning community participants, learning community participants, traditional curriculum resident students, and traditional curriculum commuter students after five years of study when considering academic year and controlling for entering ability as measured by high school grade point average and ACT score.

Null hypothesis 1a: There is no statistically significant difference, on average, in cumulative grade point average among living-learning community participants, learning community participants, traditional curriculum resident students, and traditional curriculum commuter students after five years of study when considering academic year.

Null hypothesis 1b: There is no statistically significant difference, on average, in cumulative grade point average among living-learning community participants, learning community participants, traditional curriculum resident students, and traditional curriculum commuter students after five years of study when
considering academic year controlling for entering ability as measured by high school grade point average and ACT score.

Null hypothesis 2a: There is no statistically significant difference, on average, in cumulative credits earned among living-learning community participants, learning community participants, traditional curriculum resident students, and traditional curriculum commuter students after five years of study when considering academic year.

Null hypothesis 2b: There is no statistically significant difference, on average, in cumulative credits earned among living-learning community participants, learning community participants, traditional curriculum resident students, and traditional curriculum commuter students after five years of study when considering academic year and controlling for entering ability as measured by high school grade point average and ACT score.

It was anticipated that this study would contribute to the growing body of research regarding the long term outcomes associated with living-learning communities and frame opportunities for future research.

**Operational Definitions**

Throughout this study, the following definitions are used to understand the terms in the analysis of outcomes:

*Academic performance* is measured in cumulative grade point average earned during the term of study.

*Academic success measures* utilized in this study are based upon persistence and academic performance.

*Academic year* represents the term in which the student began first study at the university and enrolled in the specific curriculum type.
ACT score reflects scores earned on the American College Testing exam reported at university admission. The ACT test attempts to standardize predicted future performance in the college or university environment assessing areas of academic competency.

Commuter students are those students not residing in campus residential facilities during their first academic year.

Entering ability refers to research outlined in Chapter II as two key predicative measures of success in college – high school grade point average and performance on standardized entrance examination like ACT score.

High school grade point is the cumulative grade point average earned in high school as reported for admission and provides evidence of prior academic performance at the student’s unique school.

Learning communities have been defined 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 with one another and their teachers as fellow participants in the learning enterprise” (Gabelnick et al., 1990, p. 19). Learning community programs are those programs which are comprised of undergraduate courses tied to a central theme which do not incorporate a residential component.

Living-learning communities (residential learning communities) are characterized as those in living arrangements which are comprised of undergraduate participants living together around a centrally derived theme or academic component.
Persistence is measured in terms of cumulative credit hours completed during the academic course of study and refers to progress toward degree completion.

Resident students are defined as those students residing on campus during their first academic year of study.

Student refers to first-time, full time undergraduate students enrolled in a four-year baccalaureate program of study. First-time refers to first attempt at undergraduate study at a college or university and full-time refers to enrollment in greater than nine credit hours in the initial term of study. Post-secondary students were excluded from this study.

Term of study refers to the university suggestion that average degree completion occurs in five years, it will serve as the designated time frame for assessment.

Traditional curriculum programs are defined as programs which are not centralized around driving academic focus or theme and are without intentional cohorts.

**Organization of Study**

This study is organized into five chapters. Chapter I provides an overview of the relevant background to the investigation. The chapter provides background in overview of research and theory, purpose of the study, research questions, research hypothesis and operational definitions used in the study.

Chapter II contains a review of the related literature, presented theories and relevant related research. It provides perspective on academic success, residential living, learning communities and living-learning communities. It provides analysis and discussion of the available research on the outcomes of living-learning communities.
Chapter III provides overview of the research design. It addresses methodology, data collection, participant descriptions, method of sampling, and description of measurements. Evidence of the selected methodology is explored in available research and potential limitations are discussed.

Chapter IV provides results of the data analysis. Statistical data are presented in support of discussion of the results.

Chapter V discusses the results of the study in the context of theory presented in the literature review. Interpretations, conclusions and recommendations for further research are summarized.
CHAPTER II
LITERATURE REVIEW

Introduction

This study served to examine the impact of participation in a living-learning community on measures of academic success. This chapter discusses broadly a theoretical framework linking student engagement and involvement via the co-curricular experience to student success. Drawing on the theories of Tinto and Astin, the chapter discusses the development of learning communities as curricular support and research regarding their use. In examination of the co-curricular environment supporting the academic experience, research regarding outcomes associated with on-campus living are examined. Finally, the chapter discusses the evolution of living-learning communities as merger between the academic learning community and the co-curricular experience by noting current research and exploring needs for future research.

Persistence and Academic Success

In the past decade, public concern about undergraduate success has challenged colleges and universities. It has created new demands for accountability in these institutions, requiring that they assess the way in which undergraduate education is currently being delivered to students. Calls for reform regarding retention, performance, and graduation rates have been placed upon colleges and universities demanding they
provide education and yield outcomes. To answer this call for accountability, institutions have begun a holistic evaluation of the university experience and its contribution to student success. In this process, focus has been shifted from teaching-centered environments to learning-centered education. This learning-centered environment focuses on opportunities and experiences that encourage active engagement, enhance learning, and support student success (Bobilya & Akey, 2002).

Barr and Tagg (1995) emphasize the transition from teaching-centered environments to learning-centered environments. The paradigm shift focuses on realigning roles in the university setting in which faculty distributes education through course content where universities are distributors of knowledge to one in which students engage in the learning process and faculty or university environments serve as the facilitators of student learning. In this construct, learning occurs within the university environment and is not exclusive to the classroom. The student experience becomes the context for learning and serves as the culmination of collective opportunities in and outside the classroom that promote learning. In the learning paradigm, the institutional purposes are not to transfer knowledge but create environments and experience that bring students to discover and construct knowledge for themselves. These learning centered environments have been associated with the combination of the classroom experience and co-curricular experiences during the university career.

Researchers and student affairs practitioners have attributed a number of the benefits of higher education to the out-of-class experiences afforded to students. These experiences, historically considered more social than academic, were linked closely to gains in confidence, self-esteem, and moral development – areas believed to be
significant in student success. These experiences stem from: conversations with faculty outside of class; participating in collaborative activities; living in a residence hall; working on or off campus; participating in student governance; involvement in student organizations; and engaging in volunteer opportunities (Kuh, 1993). The works of Astin and Tinto provide a framework related to retention and student success based upon these experiences.

Astin studied individual student characteristics and institutional characteristics to determine how such variables affected student retention. Astin (1984) concluded that factors contributing to persistence were linked directly to involvement, whereas departure was associated with noninvolvement. The theory presents that involvement means the investment of physical or psychological energies along a continuum of time and qualitative and quantitative components, and the amount of student learning is contingent on the quality and quantity of involvement. In addition to involvement, Astin (1997) indicated that four variables accounted for the bulk of variance in retention. These included high school grades, admissions test scores, gender, and race of the student. In statistical analysis, these factors showed significant impact upon student measures of success and student involvement levels.

Tinto explored student commitment to an institution, aspirations for a degree, and integration into the academic and social life of the campus. According to Tinto’s (1987) theory, high levels of integration into the academic life of an institution led to greater commitment to the institution. A greater commitment and integration led to a greater likelihood that the student would be retained (Reason, 2009). Tinto’s theory of departure furthered the critical role of involvement but emphasized the quality of the involvement
as it related to the student experience. Tinto (1993) emphasized integration into the learning experience between social and the academic – the interaction must yield substance to the student in which relationships are drawn between academic content and social experience such that students draw connections between them. He suggested that increases in student integration results in greater student commitment to personal goals, the institution, and ultimately yielding retention and academic success (Tinto, 1993).

Tinto (1986, 1999) asserted that the process of becoming integrated into the academic and social systems of a college occurs when students successfully navigate the states of separation, transition, and incorporation. In sum, these stages involve the acclimation of the student, exposure to new experiences and values, and acceptance into the university environment. He argued that systems, in particular with large residential environments, serve as facilitators to such transition and incorporation, encompassing residence hall activities, Greek life, and contact with faculty, intramural sports and a variety of other experiences.

Tinto (1996) reported that approximately 57% of college dropouts leave before the start of the second year and to this end, the most aggressive interventions have been staged for the first to second term, and first to second year transition of university students (Reason, 2009). Attrition rates reduce by half for each year past the first year that an institution can retain a student (Reason, 2009). Thomas (2000) tested Tinto’s model in a small liberal arts school and found that students with broad well connected networks reported better satisfaction, grade performance, and persistence during the first year of study. Thomas (2000) suggested that residential programs design opportunities to
encourage the development of student relations, especially the development of diverse connections over the freshman year.

Critics have suggested that Tinto’s model has failed to account for the richness of diversity of students on campus. There are implications of integration for minority students into predominately majority institutions and the impact may yield adverse consequences. These implications may evidence in the acculturation and integration processes which implies conformity to the majority. It has been contested as well that his concept of integration in these environments breaks down communities into subgroups allowing for unique areas of impact and support which may offset such oppressive implications (Wolf-Wendel, Ward, & Kinzie, 2009). To this end, Tinto’s model may be narrowed and enhanced to support the transition of minority students into the university experience. Wolf-Wendel et al. (2009) suggested that integration occurs at both the minority peer group level as well as university provide balance and support rather than conformity to the majority.

According to Pascarella and Terenzini (1998), many of current studies on retention are based upon the traditional view of students rather than changing dynamics of the university environment. In looking to assess student success broadly, persistence and academic performance, as measured by grade point average, have been utilized as the primary point of analysis by a number of studies. In addition, student background characteristics and levels of engagement were found to be significantly related to their grades in college and it was found that grades are an indicator as whether students will persist and graduate (Pike et al., 2008). As such, a relationship has been suggested between background characteristics and student performance.
Astin (1991, 1993) presents a model to evaluate the impact of environmental experiences on students. The Input-Environment-Outcome (I-E-O) model serves as a guide in assessing those variables, changes or growth after exposure to an environment. The core of the model draws from paring outcome characteristics with input characteristics after experiencing a specific environment. The I-E-O model defines three essential components of educational assessment. Inputs identify student characteristics typically in skill sets at entry to college. Environment is the intervention or student experience on campus. Outcomes are the skills or ability or experiences educators seek to reach through the environment or campus experience. The model allows educators to correct or control for input differences when assessing intervention outcomes.

Research supports that student background characteristics experiences shape outcomes (Inkelas & Weisman, 2003). In an overview of studies, Reason (2009) found that gender, race and ethnicity, socioeconomic status, high school grade point average, college grade point average, as well as the interaction of these variables are related to persistence. Reason (2009) found that in many studies, high school achievement and race/ethnicity were statistically significant, whereas the influence of gender was mixed. He identified that studies that examined retention beyond the first semester of study showed college grade point average to be significant (Reason, 2009). For example, Astin, Korn, and Green (1987) indicated that a student’s self-reported grade point average and institution reported SAT/ACT were the two strongest predictors for retention. Students with the highest SAT scores were six times more likely to graduate than students with lowest SAT scores and those with high grade averages were seven times more likely to
In a study by Tross, Harper, Osher, and Kneidinger (2000), grade point average and SAT score accounted for 29% of the variance in retention.

Milem and Berger (1997) found that students who had higher high school grades were more likely to become involved with activities and less likely to become involved with faculty. These students were more likely to report perceived levels of institutional support and supported a direct positive path between high school grades and academic integration. However, in looking at both fall and spring freshman perception and performance, Milem and Berger (1997) found that academic integration did not predict either institutional commitment or intent to re-enroll. Social integration did serve as a significant positive indicator of institutional commitment and intent to re-enroll. They concluded that social integration played a more influencing role on predicting student persistence than did academic integration. Of note, their study was conducted at a highly selective institution where the role of academic integration may have been thwarted based upon base ability levels.

In a study to determine the degree to which college grades could be explained by student’s ethnic identity, it was found that high school GPA and SAT scores together explained 12.6% of the variance and 9.9% associated with ethnic identity development. Environments which provided engaging supports and activities were linked to engaging otherwise marginalized students and accounted for 22.5% (including controlling for high school grades and GPA). Engaged communities may therefore be significant for ethnic minorities (Pizzolato, Chaudhari, Murrell, Podobnik, & Schaeffer, 2008).

According to Reason (2009), a flaw of much of the persistence research is that it fails to consider the wider variety and range of influences that shape student persistence.
and instead focuses on discrete prescriptions to address concerns. The entirety of the college experiences may well be more important than particular attributes of an academic major (Pascarella & Inman, 1998). Significant relationships between the student engagement measures and college grades generally confirm the findings reported by Tinto and others (Pike et al., 2008). Kuh (1993) concluded that experiences beyond the classroom made substantial contributions to student learning and personal development. Involvement in student government has been linked to gains in understanding and appreciation of difference (Kuh et al., 1994). Pike et al. (1997) found that in-class and out-of-class experiences were significantly related to student learning, development, and academic achievement when controlling for gender, race, and entrance exam score. Pike et al. (2008) found that working 20 hours or less on campus was significantly and positively related to grades acting through student engagement. Students working 20 hours a week or less on campus had higher grades than those who did not work or worked more than 20 hours. Student work experiences accounted for up to 3% of their perceived engagement measures.

Given these and other findings, institutions are now challenged to create situations for ample opportunities for student involvement in meaningful outside-of-class activities (Kuh et al., 1994). Tinto’s theories of student departure and Astin’s idea of involvement point to the need for the integration of students’ social and academic lives to improve academic success and retention and suggest the power of learning communities to support student persistence (Talburt & Boyles, 2005).
Learning Communities

Theorists suggest that an institution can increase the likelihood that students will experience college as a learning experience across the classroom and out-of-class settings by linking programs and activities across the dimensions of students’ lives, removing obstacles to student goals (Kuh et al., 1994). Out-of-class interaction between students and faculty has been suggested to promote student integration and has been linked to persistence; specifically, when such programs are developed as freshman year experience programs; providing advantage to students who might otherwise be disadvantaged based upon high school grades or admissions testing (Sidle & McReynolds, 2009).

Programs have been developed to foster students’ transition to the university setting and have been designed to assist students who might typically leave college before their second year. Programs evolved to offer experiences through interdisciplinary themed courses, service learning, and mentorship programs providing opportunities for social interaction and engagement (Eck, Edge, & Stephenson, 2007). One such program that gained significant momentum is the learning community.

Learning communities are characterized by a variety of approaches that link or cluster classes around a theme and a cohort of students during a given term. This represents an intentional restructuring of time and experience for students (Bobilya & Akey, 2002). Learning communities have been defined as:

Any one of a variety of curricular structures that link together several existing courses-or curricular structures that link together several existing courses-or actually restructure the material entirely- so that students have opportunities for deeper understanding and integration with one another and their teachers as fellow participants in the learning enterprise. (Gabelnick et al., 1990, p. 19)
Shapiro and Levine (1999) add:

Learning communities represent a major transformation in how campuses think about teaching and learning and are characterized by a variety of approaches that link or cluster classes during a given term, often around an interdisciplinary theme, that enroll a common cohort of students. (p. xi)

The origins of learning communities are attributed to the work of Alexander Meiklejohn. Meiklejohn introduced the “Experimental College” at the University of Wisconsin in the 1930s in reaction to the increased disciplinary specialization and fragmentation of the undergraduate curriculum in an attempt to build community and establish connections for students in the learning environment (Romanoff, 2000; Stassen 2003). In the “Experimental College” coursework centered on the objectives of a student cohort- merging what were considered fragmented experiences in education creating an environment where instructors serve in dual purpose as educator and facilitator. From his early framework evolved the learning community in which focus has been placed on developing cohesive connections between study and university primarily for first year students. Their focus centers on the removal of learning barriers and enhancement to learning, particularly for first year students, emphasizing collaboration, interdisciplinary themes, and active learning (Johnson & Romanoff, 1999).

Astin and Tinto focused on factors that affect student success and persistence draw central to the themes of learning communities. Tinto’s (1993) theory of student departure suggested that students are more likely to remain at an institution if they have opportunities to become connected to the life of the institution in both their social and academic lives through a process of integration. Astin’s (1993) study of institutional factors that affect student success also highlight the importance of activities that
encourage students’ active engagement in life of the institution. His findings suggested that interactions with peers and faculty around both social and academic initiatives were the most important facilitators to engagement. Taken together these theories provide the core structure as to why participation in learning communities should affect students positively. Through encouragement of integration and engagement, learning communities should promote and enhance the university experience for the student (Lenning & Ebbers, 1999; Stassen, 2003).

Learning communities can build a sense of cohesion belonging and integration among students drawing on the themes of Astin and Tinto with regard to engagement (Levine & Shapiro, 2000). In format, models are varied with paired or clustered courses, cohorts in large classes, team taught programs, and innovative instruction including team and experiential learning and are most successful when structures are consistent with institutional and student needs (Shapiro & Levine, 1999). Five categories have been identified: linked courses which involve the same students in more than one course; learning clusters which link courses by content; Freshman Interest Groups which link coursework by guiding themes; federated learning communities which link coursework by faculty teams; and coordinated studies which link interdisciplinary curriculum around a central theme (Buddel, 2005; Gabelnick et al., 1990; Inkelas & Weisman, 2003; Kellogg, 1999; Schein, 2005; Stassen, 2003).

Although the curricular and co-curricular content may vary in learning communities, each has shared knowledge, knowing, and peer responsibility in the building and collaboration of learning (Tinto, 1999). The fact that a great variety of models are all referred to as learning communities and the reality that they are likely to be
implemented with varying degrees of success raises a number of evaluation questions regarding the impact of their outcomes (Stassen, 2003). Criteria for the learning community successes are typically based upon data that reflect measurable variables, such as retention in college, academic program, or grade point average (Schein, 2005).

There has been a significant body of research regarding outcomes associated with learning communities (Stassen, 2003). Consistent with his theory, Tinto (1996) found that students in learning communities report themselves as more satisfied with their first year experience and more likely to persist beyond the freshman year. In a study conducted by Smith, Ward, Willermet, and Guerrero (2004) it was found that one year persistence rates for first year student fall term participants in the first year experience program successfully exceeded performance of non-participants. Of those participating, retention rates were significantly greater for the first year of study.

With the increase in popularity and use of learning communities as an academic intervention and persistence tool, the research findings identified critical factors of impact. For example, in a study seeking to determine the relationship with participation in freshman experience programs and retention of student participants as compared to those not enrolled in the program. Sidle and McReynolds (2009) found student participants in a singular fall program persisted through the first term at a rate of 9% higher than those who did not participate. Of these participants, higher percentages completed through the second term and tended to earn a higher mean grade point average than non-participants, 2.19 as compared to 1.99. Students who participated in the program earned 68% of credit hours attempted a rate significantly higher than non-participants. Using multiple regression analysis it was found that although there was no
causal effect between participating in the program and completing more of the first academic year, cumulative grade point average was significant for lesser performing students and minorities—as predicted by ACT score. In sum, student participants in the program had distinct effects for students to persist to their second year at a higher rate and completed greater number of credit hours than their equivalent counterparts when considering entering ability (Sidle & McReynolds, 2009). With such findings and that of similar others, the research suggests that learning communities may provide the greatest reach when focusing on students who are less likely to succeed.

In most studies, it is noted that motivation to enroll in such programs may have been a factor to the success of their participants. Specifically, students who voluntarily enroll in learning communities may have greater initial levels of commitment and motivation than similar others who opt not to participate. Likewise, learning communities are likely to recruit and employ faculty who are more apt to work and engage students in significant ways, allowing for greater opportunities to establish relationships and structure environments to build supports that engage students in the environment identified as indicators of student success by Astin and Tinto. In consideration of the factors, Stassen (2003), after evaluation of the extensive body of research regarding learning communities noted that, “Even in the least coordinated, most basic learning community model, students show more positive outcomes (first semester GPA, retention, first-year experience) than non-learning community students” (p. 581).
Living on Campus

The work of Chickering (1975), Astin (1977), and Pascarella and Terenzini (1991) have laid the foundation that residence halls make a contribution to student education. According to Chickering (1975), living on campus as opposed to commuting from home has a positive effect on students as a result of the types of relationships students form with others in the residence halls. He suggested that students are more likely to break from traditional groups in such environments and willingness to engage others openly is significant.

Basic challenges to students come in the form of dealing with a large group of peers in a community. Merely dealing with roommates for the first time is their adjustment as well as facing new challenges of dealing with a host of peers’ ideas about how one’s life should be lived and the differing moral and ethical views that drive behaviors in the context of living without the constant parental supervision (Schein, 2005; Stassen, 2003). Residence halls represent student safe places where they can retreat from the challenges of their academic experiences and tend not of be locations of stretching their intellectual capabilities; yet they represent the comfortable setting where students may feel safe to take the kind of challenges they need to stimulate their intellectual growth (Schein, 2005).

The concepts of marginality and mattering as presented by Schlossberg (1989) serve as precursors to the potential for the necessary involvement and engagement suggested by Astin and Tinto and align with conditions students face in the residential environment. The university environment provides opportunities for students to engage new environments and assume new roles regularly (Schlossberg, 1989). Marginality
occurs when individuals assume new position or status and the individual holds
uncertainty about the nature and scope of the new position or role. Marginality may
evidence in first year students as concerns about associating, fitting with others, or
finding comfort within the newness their institutional setting. When marginality emerges,
individuals then become concerned about mattering to others. Mattering includes
attention and sense of importance from others through caring, compassion, mutual
interdependence and appreciation. The concepts of marginality and mattering in the
context of higher education suggests that it is important that institutions of higher
education need to support first year students in transition from marginality to mattering as
a precursor to students becoming involved in programs that may support development.
Creating communities within the context of interconnectedness and built upon
relationships supports engagement and involvement to achieve such outcomes (Evans,
Forney, & Guido-Dibrito, 1998; Schlossberg, 1989). Residential environments support
these outcomes as result of students’ acclimation to the residential environment.

It has long been cited that abundant evidence exists that living on campus has
strong positive effect on student persistence (Berger, 1997). Pike (2002) found that living
on campus was significantly correlated to openness to new ideas and appreciation of
diversity when controlling for demographic and entering characteristics. Compared to
students who live off campus, resident students have significantly higher levels of faculty
and student interaction, peer support, greater opportunities for interaction, and
significantly greater satisfaction and commitment. The interaction and inclusion effects
of the residence halls, coupled with the fact that residence has students come better
prepared to succeed, help explain why resident students are significantly more likely to persist than those living off campus (Pike et al., 1997).

Pascarella and Inman (1998) reported on a culmination of research that documents the role of student residence on a number of outcomes including values, esteem, independence, moral judgment, and degree attainment. In these studies, differences between residents and commuters in such areas held solid when controlling for classification variables as race and high school achievement; findings suggest that residential environments may be a factor that exceeds various background variables (Pascarella & Inman, 1998). This further suggests that the university residential environment may positively impact the student experience.

In a meta-analysis of the influence of residence halls on academic performance, the findings identified that residence hall students scored better academically than those living at home and that on-campus living influences academic performance. When controlling for the 21 studies where past academic performances were used, Blimling (1999) found that living in a conventional residence hall may not have significantly enhanced academic performance over living at home; however, past academic performance, partnered with motivation and curriculum may be significantly influential factors. The study also found that residence hall students were likely to perform better academically than students living in fraternity or sorority houses and students living in off-campus apartments (Blimling, 1999).

In an overview of a number of studies, living on campus is also significantly and positively associated with persistence even when precollege factors such as high school grades and socioeconomic status are considered (Pascarella & Inman, 1998). For
example, Flowers (2004) found that living on campus denoted specific gains for minority students, specifically African-Americans at predominately white institutions. Flowers found that students who lived on campus were more likely to persist in college than ones who did not, were more likely to develop a sense of accomplishment and social skills, were more likely to be involved in campus activities, and demonstrated higher grades than non-residents. African-Americans, in particular, identified greater understanding of self, moral development, social acclimation, teamwork and commitment in institutions where otherwise supports may not necessarily be present. These findings support retention studies that have indicated that students in residence halls persist at higher rates than do commuters, and that on-campus living accounts for 12% advantage in students’ chance of persistence (Berger, 1997).

In examination of the differences between resident and commuter students on cognitive gains, Pascarella and Inman (1998) found that living off campus may not yield cognitive disadvantages, as some commuters can demonstrate similar gains as resident students, assuming that the appropriate campus supports are in place to account and accommodate for commuter student needs and lifestyles. They note that the one year component of their study reflects those changes appearing after the first year of study, whereas they suggest that other studies indicate longer time frames are critical in reflecting cognitive gains college (Pascarella & Inman, 1998). They highlight as well, that studies have suggested that resident students historically may have had greater access to afford living on campus and may have had higher grades during high school. In light of these comparisons they placed emphasis upon controlling for pre-college variables and
found that grades during the first term for the groups did not differ significantly (Pascarella & Inman, 1998).

Tinto’s (1993) emphasis on the interaction between the individual students and various campus communities suggest that residence hall experiences provide frameworks to enhance persistence. Research on residential status and academic and social integration, as tied to Tinto’s work, indicates that resident students tend to participate in on-campus activities at higher levels than non-residents, and therefore levels of such involvement may influence student engagement, commitment, and persistence (Pascarella & Inman, 1998). McCluskey-Titus and Oliver (2001) mirrored Tinto’s and Astin’s position when they reported that the data suggest that students who live in residence halls feel a sense of belonging; have people interested in their intellectual development; have well developed relationships with peers on their floor; and achieve higher grades. Students with a strong sense of community in campus environments like residence halls are more likely to be fully connected or more integrated in to the campus (Berger, 1997; McCluskey-Titus & Oliver, 2001). Berger’s (1997) study confirmed that the strong connection between peer relations and community emphasized the connection with the residence halls and the development of the student’s involvement on campus. The study concluded that the residential communities serve as a successful bridge between the student and the overall normative environment on campus providing a framework for their engagement with faculty and their satisfaction with the institution. This is the same type of engagement Tinto and Astin suggest as supportive of persistence and academic success.
Living-learning Communities

Following the constructs developed by Tinto and Astin and noting the impact of the suggested student social and academic integration which promotes engagement to yield positive outcomes, provides support for the merger of the successes of living on-campus and learning communities. Intentional living-learning communities expand upon the traditional models of Cambridge and Oxford residential living and appear to be higher education’s attempt to respond to the student and societal need for quality education (Pasque & Murphy, 2005).

In an effort to promote academic achievement and increase retention among residence hall students, a need was identified to provide college students with out-of-class academic opportunities in residence halls that enable them to use their surroundings as methods of support (Li, McCoy, Shelley, & Whalen, 2005). The critical difference between living-learning programs and other learning communities is that the participants not only partake in coordinated curricular activities, but also live together in a specific residence hall where they are provided academic programming and services. They were created as a means of integrating experiences by providing a community that fosters greater faculty and peer interaction in an academically and socially supported environment (Inkelas & Weisman, 2003). It has been suggested as well that traditional residential environments may position social engagement against academic focus, where the living-learning community merges the two environments (Stassen, 2003).

The impact living-learning programs may have on shaping student development may be supported by a composite of environmental models as suggested by Strange and King (1990). Human aggregate models suggest that environments reflect the collective
characteristics of the individuals that inhabit them. These environments also shape the behavior of the individuals inhabiting them. Physical models suggest that the features of environments set limits on the behavior that may occur within them. Structural and organizational models stress the importance of goals and purposes of environments that give rise to organizational structures and encourage or discourage certain types of behavior. Perceptual models identify that how an individual experiences and environment is the result of their interpretation of that environment. Strange and King (1990) suggest that these, taken together, help frame how various aspects of educational environments attract, sustain and satisfy students.

Environmental theories suggest that development occurs when challenges in the environment are balanced by supports. The level of challenge, support and individual response drives outcomes. The given response is contingent upon the individual experiencing it. Effectiveness of educational environments is therefore contingent upon the time in which these experiences are introduced and student characteristics matched with appropriate environmental conditions (Strange & King, 1990). Person and environment interaction frameworks indicate that mutual shaping occurs through transactions between individual and their environments. Thus under certain conditions, it is possible to influence the outcomes associated with college attendance. To this end, learning and personal development occur through transactions between students and their environment and therefore experiences in-class and out-of-class contribute to learning and development (Evans et al., 1998; Kuh et al., 1994; Strange & King, 1990). Supporting these assertions, Kuh (1993) found that knowledge acquisition and academic skill development continued to be closely associated within the classroom and living-
learning environments. In the context of living-learning communities, creating the balance between the classroom environment, living environment, peer group environments and co-curricular supports present facilitates desired outcomes.

**History and Philosophy of Living-Learning Communities**

Although the living-learning community is a fairly recent phenomenon, the origins of these programs date back to the medieval roots of higher education and the residential colleges at Oxford and Cambridge (Inkelas, Soldner, & Szeleny, 2008). The concept of merger between academic and residential for the purpose of student success can be found as far back as 1257, with the College of the Sorbonne (to become the University of Paris). Sorbonne was founded for theology students who wished to engage socially and intellectually. In this early setting, students were grouped in housing by discipline and overseen by faculty in residence. Faculty provided supplemental, informal instruction in these living settings and began expanding residential responsibilities to include learning and social support (Chaddock, 2008).

The Sorbonne model was followed with the founding of Balliol College at Oxford in 1260. The original Oxford and Cambridge residential colleges were housing units where students were housed by discipline collectively with mentors and faculty who moderated the educational and social environment. Senior scholars presided over junior scholars in residence in these early residential colleges. By the mid-15th century, 11 colleges had been formed at Oxford and 12 at Cambridge and college study centered in these residential environments which included cooks, libraries, and tutors in residence. These colleges became self-contained social and academic societies that went beyond
mere boarding rooms by providing critical support for instruction and administration of student life. The Oxford and Cambridge residential colleges eventually provided models for the living unit as a place of learning, instruction and peer support. The tutorial system and informal lectures, in particular, employed in these colleges introduced the concept of living units as locations where instruction and learning were fused (Chaddock, 2008).

The Oxford and Cambridge format dominated early American colonial colleges but was largely discontinued as American institutions of higher education matured into the modern research focused institutions (Inkelas et al., 2008). Harvard opened “Old College” in 1642 and modeled itself after the residential colleges of Oxford and Cambridge. Yale followed in “Mother Yale” in 1717. Each of these residences for students offered dining, social engagement, learning and peer guidance. Financial limitations facing many institutions limited the expansion of residential colleges, as growth in universities spurred growth of traditional housing units and dormitories. In 1763, Harvard constructed standard dormitories and Yale rapidly expanded with many dormitories in 1821. In the 19th century, many American universities shifted from Oxford and Cambridge models to merely providing rooms to accommodate economic considerations and growth in demand (Chaddock, 2008).

Residential community development experienced resurgence at the University of Chicago in 1892 as the creation of residential quadrangles guided the feel of residence and campus. President William Rainey Harper called for a greater sense of community on campus indicating the campus environment supports intellectual growth and competence. Other campuses began following Chicago in forming the residence hall movement.
between 1896 and 1915 with the idea of communities of scholars beginning to emerge in the early decades of the 20th century (Chaddock, 2008).

In tandem with campus experience model put forth by Chicago, the English model emerged again in the 20th century, most notably at the Ivy League institutions (Inkelas et al., 2008). In 1930, Harvard instituted houses for student residence, hoping for academic integration. Each house had a master, senior tutor, and faculty associates with living units containing dining libraries and recreation space. Yale followed Harvard, seeking to put students in direct contact with faculty and to provide opportunity for students to know each other and exchange in ideas outside of class (Chaddock, 2008).

The early work of John Dewey, Alexander Meiklejohn, and Joseph Tussman had a profound influence on how living-learning communities are defined and formed today. (Johnson & Romanoff, 1999; Shapiro & Levine, 1999; Talburt & Boyles, 2005) In 1916, John Dewey suggested the environment served as intermediary in developing outcomes associated with university learning (Hurd & Stein, 2004). Dewey described education as a purposeful, student-centered social process that required close relationship between teacher and student. He suggested learning environments should center on cooperative and collaborative approaches. Dewey’s insights provided education as a process of reorganization, reconstruction and transformation (Johnson & Romanoff, 1999; Shapiro & Levine, 1999; Talburt & Boyles, 2005). Like Dewey, Meiklejohn was troubled by the fragmentation and specialization evolving in higher education where students encountered segmentation in their learning experiences. Meiklejohn focused on developing the mind and citizenship through expansion of educational experiences. Meiklejohn founded his philosophy of education practice upon the principles of
connected and integrated learning (Johnson & Romanoff, 1999; Shapiro & Levine, 1999; Talburt & Boyles, 2005).

Perhaps the most notable of the early living-learning communities was the University of Wisconsin’s “Experimental College” founded by Meiklejohn in 1927. The “Experimental College” focused on a central theme of developing citizenship and demonstrating democracy among students to prepare them to be civilized members of society. At its core, his community focused on civic development and the development of democracy while challenging students to live by the democratic ideals they studied (Inkelas et al., 2008; Shapiro & Levine, 1999) The “Experimental College” merged curriculum, residence, and classroom space for students. Key to the program was student support and discourse occurring in the college (Chaddock, 2008).

By the 1950s, American universities began to pay close attention to the developing idea of a comprehensive undergraduate experience. Renewed residential colleges formed in response to the growing demand for the experience and promote integration of faculty, learning to promote close knit communities for their potential impact on student achievement and character formation (Chaddock, 2008). Joseph Tussman was a student and protégé of Meiklejohn. Tussman identified the challenges and conflicts faced by university in transition from college to university and the impact it had upon the fragmentation of liberal undergraduate education (Shapiro & Levine, 1999). Mirroring Dewey and Meiklejohn, Tussman indicated that coursework was seldom integrated into cohesive useful wholes for students. In 1965, Tussman developed the Experimental Program at Berkeley based upon Meiklejohn’s Experimental College. In it faculty and students shared common living and followed a unique set of rules. The
program did not follow conventional semesters or grading, rather centered its focus on the driving theme of civilization with integration of a number of disciplines and topics (Hurd & Stein, 2004).

Tussman’s work inspired the Evergreen State College’s development as a specialized satellite campus of the University of Washington. Evergreen built its curriculum around coordinated studies taught by faculty teams organized around central themes. Central themes from seminars guided student study as established by Meiklejohn and served as the center of programs at Evergreen (Shapiro & Levine, 1999). Patrick Hill founded a similar program at SUNY Stony Brook. SUNY’s Federated Learning Communities in 1976 reorganized curricular content under an interdisciplinary theme. Faculty were deemed master learners and participated in study alongside students (Shapiro & Levine, 1999). In these modern communities peer mentoring has played a pivotal role in the student experience (Levine-Laufgraben & Shapiro, 2004). In 1983, Hill became Provost at Evergreen and in 1985 the Washington Center for Undergraduate Education at Evergreen was established (Hurd & Stein, 2004).

The modern version of the living-learning community is most notably recognized as rooted in early residential colleges and Meiklejohn’s principles (Inkelas et al., 2008; Shapiro & Levine, 1999). From these roots today’s living-learning communities have evolved into an eclectic mixture of programming with dozens of different foci (Inkelas et al., 2008).
Structure of Living-learning Communities

Classifying the intensity, degree or composition of living-learning communities provides a spectrum of interpretation of program development and impact. Inkelas (2008) notes, “Indeed perhaps the only aspect all living-learning programs across the nation share is that they are primarily housed in residence halls. Otherwise, they vary in size, structure, mission, staffing, theme, funding, academic rigor, and a host of other facets” (p. 9). Soldner and Szeleny (2008) present that the National Study of Living-learning Programs broadly identifies living-learning communities as those where undergraduate students live together in a portion of a residence hall and participate in academic or extracurricular programming especially for that group. In a study of more than 613 living-learning programs, Soldner and Szeleny (2008) concluded that differentiation seemed to be the norm rather than the exception. The large variety poses challenges in creating delineating lines of the caliber of living-learning programs.

Shapiro and Levine (1999) note that all learning communities have gradients of four critical components: curricular structure, faculty role, co-curricular opportunities, and opportunities for peer leadership. Curricular structure represents how courses and students are organized in the community. Faculty role represents the degree of faculty involvement in collaborating with curricular integration or co-curricular involvement. Co-curricular programs represent the degree of integration of in- and out-of class experiences. Opportunities for peer leadership represent the degree of involvement and sophistication of peer staffing. The curricular component of residentially-based living-learning programs typically involves, learning clusters, freshman interest groups or team taught programs. Team-taught programs enroll students in two or more classes organized
Clustered courses link individually taught courses through a cohort or block scheduling. Freshman interest groups are the simplest in organization and cost and involve creating subgroups of students in enrolled in larger courses or around a central theme (Levine-Laufgraben & Shapiro, 2004). Hurd and Stein (2004) note that faculty involvement may be limited to course oversight and as embedded to in hall engagement and collaboration. Peer leadership may range from in-hall staff to specialized upper class student involved in specific majors and programs. Co-curricular engagement may range from distinct curricular activities involving speakers, academic support, service, and social projects to informal social engagement balancing the curricular experience.

Smith, MacGregor, Matthews, and Gabelnick (2004) concluded that there is considerable variability in living-learning community programs when it comes to focus, duration, type of faculty involvement, type of coursework, and administrative oversight. Given the wide range of intensity possible in the design of living-learning programs, classifying these programs and their intensity discretely provides challenge. Love and Tokuno (1999) have developed a method for mapping learning communities on a continuum of a number of relevant dimensions. The framework includes five dimensions considering degrees of: (1) student collaboration, (2) faculty collaboration, (3) curricular coordination, (4) shared setting, and (5) interactive pedagogy. In application of this model, Stassen (2003) utilized a sixth dimensional characteristic reflecting degree of shared identity. Peer interaction is noted around activities around academic work. Faculty interaction is noted as interaction outside the classroom. Curricular coordination refers to
the positive development of a co-curricular environment. The combination of Love and Tokuno (1999) and Stassen (2003) continuum is shown in Table 1.

Table 1

Continuum of Living-learning Communities

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<th>Dimension</th>
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<td>Faculty Collaboration</td>
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<td>Curricular Coordination</td>
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<td>Interactive Pedagogy</td>
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In application of this continuum, Stassen (2003) found that all variations of the communities have the potential to enhance academic performance. Perceived levels of intensity or integration of coursework did not significantly impact outcomes and concluded that even if the classes that students share are not intentionally integrated, when they live and learn together it can be very effective in improving student adjustment, engagement, retention, and academic success identifying that the general population can benefit significantly from even very limited and uncoordinated living-learning community efforts. The study concluded that the modified continuum allowed for an enhanced contextual framework for assessing living-learning communities.
Research on Outcomes of Living-learning Communities

Since their rise in popularity more than 15 years ago, outcomes of living-learning programs have been studied extensively. Living-learning communities have been associated with gains in critical thinking, cognitive development, strong peer interactions, and more frequent interactions with faculty than traditional residential environments. Broadly speaking, living-learning participants are noted for higher levels of involvement and interaction and serve as drivers for opportunities to foster engagement and commitment (Garrett & Zabriski, 2003; Kuh et al., 1994; Pike et al., 1997). Students participating in these programs have reported greater gains in their own education (Pike, 1999). These findings suggest that participation in such communities support the involvement and engagement identified as supportive of student success.

In analysis of a living-learning program, supporting the findings of Astin and Tinto, Johnson and Romanoff (1999) examined the Russell Scholars Program at the University of Maine after its first year as a learning community. They used a matched sample of program participants with a control group on age, gender, enrollment status, and entry exam scores to compare to program participants in their analysis. Although not statistically significant, participant grades were slightly higher than the control group (2.57 versus 2.32) and participants earned more credits than did the control group (22.56 versus 19.31) after the first year of study. Program participants did report significantly higher levels of satisfaction and engagement than non-participants as well as reported greater involvement on campus.

Mirroring the findings of Johnson and Romanoff (1999), Pike et al. (1997) found that participation living-learning communities had a significantly positive effective on
student interaction and social integration, and ultimately institutional commitment after controlling for entering ability. However, it was found that academic achievement was primarily influenced by entering ability, academic integration, and social integration. They concluded that although residential learning communities did not directly impact student persistence after controlling for entering ability, they found that living-learning communities did enhance persistence by increasing interaction between faculty and students (Pike et al., 1997).

While numerous studies suggest the positive impact through engagement and interaction of living-learning programs, limitations include more detailed study of the full range of living-learning programs offered (Stassen, 2003). In looking to the nature and type of living-learning programs, the nature of program deliveries and target audiences, while varied, may yield similar outcomes. In a study comparing the outcomes of living-learning students to non-participating students and providing analysis of three different types of living-learning programs, Inkelas and Weisman (2003) sought to determine whether participation in these programs foster the student engagement and outcomes associated with them. Students in living-learning programs were found to be more engaged in key learning activities and perceived their environments more positively than non-participants and tended to find their resident environments more supportive than non-participants when controlling for entering ability as an associative measure of engagement and likelihood of academic success. The central theme across each of the uniquely designed programs was the commonality of peer support and was seen as linked to academic outcomes (Inkelas & Weisman, 2003). Programmatic format, structure, or intensity of the learning community did not impact format or finding of these outcomes,
suggesting that even the most moderate of living-learning program may have a significant outcome. In fact, the least structured and least selective living-learning community program in the study yielded the most significant differentially positive outcomes than more coordinated, selective models (Stassen, 2003).

Interesting in their findings is that direct relationships were not identified between participation in the living-learning program and academic and persistence measures. They attributed these findings to the nature, primarily residential institutions (selective and private) where opportunities for engagement may have been strong, the differences of residence hall students may have been muted by already significantly developed opportunities in hall (Johnson & Romanoff, 1999; Pike et al., 1997). Of note, specifically with regard to reports of engagement, commitment, and satisfaction may be extremely impactful for large institutions where students must travel distances between classes and have difficulty meeting peers. They found that a residential learning community can mitigate many of these difficulties to produce outcomes where significant gaps may exist (Johnson & Romanoff, 1999).

Contrary to the findings of Pike et al. (1997), a number of studies have identified direct outcomes. Pasque and Murphy (2005) found that participation in living-learning programs at The University of Michigan was a significant predictor of academic achievement over past academic achievement, socio economic status, and demographics, accounting for 1.1% of variation in grades. Although small, the impact was significant. By comparing freshman in residential learning communities to those in traditional residence hall environments, Kanoy and Bruhn (1996) found that residents in these communities had significantly higher grades than other resident students, yet did not have
significantly different retention rates. Stewert (2008) found that University of Maryland College Park freshman participants’ first to second year retention for living-learning participants for the 1994 cohort 91.6% and for the 2006 cohort 96% was significantly greater for their respective rates of general population of 87% and 92.7%. Schroeder, Minor, and Tarkow (1999) reported significantly greater levels between the first and second term than non-participants with retention at 96% and non-participants at 91%. They found that participants had higher first to second year retention rates, 87 versus 81% of non-participants and significantly higher grade point averages when controlling for entering ability (Schroeder et al., 1999).

In a study of Key Learning Community at Colorado State University, Nosaka (2005) found that participants outperformed non-participants, resident students, and non-residents in both first to second year persistence and first year grade point average. The study did not control for predicted or entering ability. Stassen (2003) found that the one year retention rate was consistently higher for learning community participants and participants earned significantly higher grade point averages. In this study multiple regression was utilized to analyze for entering ability, finding a positive impact of participation over predicted (based upon high school grades and entrance exam score), even after entering ability was controlled, yielding better academic performance and persistence levels. For example, participants were 34% more likely to persist than non-participating individuals with the same entry characteristics. Uniquely, these means were not found for Honors students. These findings reinforce that when entering ability is considered, living-learning programs have the greatest significant performance measures for students who are predicted to perform less well and retain at lesser levels. The impact
of the living-learning program provides the least significant support for better academically prepared students (Stassen, 2003). Of note with these findings, this study did not explore racial and ethnic backgrounds in its analysis.

Several studies found significant impact for living-learning programs on specific populations of students. In evaluating the Scholastic Enhancement living-learning program at Miami University, a program designed to assist conditionally admitted students, Dixon and Ward (2008) found a persistence rate of 92.3% higher than the university’s rate for minority students of 81.5% and non-minority students of 85.8%. In a study of the Ingersoll Residential College, Edwards and McKelfresh (2002) found that ethnicity significant impacted participants over non-participants in the living-learning community. Non-white participants in the program were retained at 89.47%, significantly higher than both white and their non-participant peers of 75.68%. Male participants in the program persisted at higher levels than male non-participants. The program was found to have a statistically significant impact on male grades in the major, whereas female GPAs were consistently higher in the major for both participant and non-participants. The program showed the most significant impact on non-whites and males who outperformed and persisted peer counterpart non-participants, and enabled male grades to reach near level of female achievement of this program. Of note, this program only considered the first year of the program and the first year of student performance (Edwards & McKelfresh, 2002). Inkelas and Weisman (2003) found that better academically prepared women and minorities (as predicted by high school grades and SAT score) saw less advantage to program participation than their lesser prepared counterparts. Findings suggest that programs like these provide advantages to students, whose predictive scores
would indication limitations to opportunities for success and may be well targeted to specific populations to yield maximum benefit.

In holistic view, participation in living-learning programs provides a broad impact upon involvement and engagement, and many yield significant outcomes with regard to academic performance and persistence. However, two common concerns arise from these findings. A commonly noted criticism in research on outcomes associated with participation in living-learning communities notes that positive student outcomes among this population may be less related to the program impact and more related to the innate abilities and preferences of the students who elected to participate in them (Inkelas & Weisman, 2003). Participants who choose to enroll in such programs may demonstrate greater levels of motivation to seek success and, to this end, may skew results.

Of particular note, the vast majority of studies focus outcome measures on the first year successes of the programs. Specifically, primary consideration is given to first term or first year persistence and academic performance measures. Few studies consider the long-term impact of participation in living-learning programs through graduation. Few assess the impact of participation on persistence to graduation and overall undergraduate academic performance. The lens of focus has been primarily on the first year of study, and while significant, little exploration has occurred beyond the first year. In a study of the SUNY College of Environmental Science and Forestry learning community, White and Tuberville (2005) not only studied first year outcomes of participants in its living-learning program; finding significant gains in academic performance and persistence, but reviewed, five years later the long-term success of the first cohort. They found that participants graduated at a 10% higher rate than non-
participants and earned higher grade point averages than non-participants. Conducting similar studies may yield greater insight into the impact of such programs on overall success.

**Challenges and Limitations of Living-learning Communities**

While the benefits of living-learning communities have been noted, challenges have emerged since their inception. One significant limitation arising with the popularity of living-learning communities is the connection between goodness of fit of the program to the cost-benefit analysis associated with program implementation. The guiding questions in this analysis stem from the benefit generated from the program and the implications of that benefit. Specifically, the appropriateness of living-learning communities provided for all populations and the complex and often costly degree of curricular integration of implementation of such programs.

Inkelas and Weisman (2008) found that living-learning community participants’ perception regarding their education showed varying degrees of impact. Survey findings suggested that living-learning communities mitigated the negative preference for learning new or different social and cultural perspectives for African Americans. Latino students in these curriculum-based programs were also positively associated with openness to new or different perspectives. Unlike their White counterparts in the program, Latino and African American students perceived greater benefit of participation in the living-learning community. This study also found that students with lower high school grades were more likely to enjoy new or differing learning perspectives than those with higher grades. These findings suggest, based upon self-reported outcomes, that effectiveness of
the reach of the program may have been limited to select sub-populations in the community.

Hotchkiss, Moore, and Pitts (2006) found that participation in living-learning communities positively impacted black men and interestingly moderately negatively impacted the persistence of white men. Findings were mirrored with students predicatively less prepared for academic success demonstrating enhanced grades except for white females who were better prepared academically and saw no improvement in grade performance. Nosaka (2005) found that living-learning community participation made its greatest gain in first year retention with students of color. Both studies concluded that the strongest impact of participation evidenced in disadvantaged groups and suggest tailoring programs less prepared students may be a prudent use of resources.

In examination of the Ingersoll Residential College Edwards and McKelfresh (2002) had findings similar to Hotchkiss, Moore, and Pitts (2006). The study found that women had significantly higher GPAs than men, yet males’ grades benefited at greater levels after participation than women. In fact, the data suggested that the program did not significantly impact female grades yet positively impacted male when controlling for entering ability. Similar findings were found with both males and non-white students for persistence. Participation appeared to have eliminated the gender gap improving the grades of male students without negatively impacting the female students. This study indicated that the predicted gap in persistence between white and non-white students by participation in the living-learning community actually raising the level of non-white student retention to a higher level rate than that of white. Of note, this study was
conducted in the pilot year to the program with a relatively small sample at a
predominately white institution.

Taken together, these studies concluded that participating in the community
specifically benefited student groups that typically appear to be marginalized in higher
education. They concluded that the strongest impact of participation evidenced in
disadvantaged groups and suggest tailoring programs less prepared students may be a
prudent use of resources. While these findings are beneficial for institutions utilizing
open access admissions policies, they may create cause for concern for those programs
which target students predicted to perform well and questions the impact of such
programs.

Implementing living-learning programs requires limited resources. The most
complex, curricular-integrated programs require the resources and efforts and staff.
Recent studies, however, have suggested that high degrees of curricular integration in
living-learning communities as compared to more loosely configured communities may
have similar impact. For example, Inkelas and Weisman (2003) found that the outcomes
associated with curriculum-based programs were not significantly different that those
with less formal programs-emphasizing the experience over significance of the
components and emphasized that socially oriented activities are most influential in
shaping preferences. In a similar study, Stassen (2003) found that the less coordinated the
living-learning community showed greater positive outcomes than more sophisticated
models and fostered integration levels similar to those of more structured coordinated
programs. While these findings support positive outcomes associated with living-learning
communities, findings support as well that extensive resources committed to intensive
curricular integration may need to be evaluated based upon desired program outcome. In many instances such intensity may be appropriate; however, findings suggest that they be considered in the context institutional academic goals and desired student outcomes.

Overall, the cost-benefit implications for offering living-learning community to increase retention are important. Of equal importance and significant reality are the resources committed to achieve desired outcomes. For example, Sidle and McReynolds (2009) found that the difference between retaining 63% of students who would otherwise persisted at a rate of 56% means that for every 100 students seven more students will return to the institution continue enrollment and continue to pay tuition and fees. Balance must be created in offering the program, targeting the appropriate students, designing appropriate curricular integration and ultimate program costs.

Another noted criticism of living-learning communities is the isolation effect they may have upon student participants. Hurd and Stein (2004) indicated that at Syracuse University concern was raised by faculty coordinators that student participation in living-learning communities may limit student participation within the larger, more diverse university community. In a study assessing student satisfaction with participation in living-learning communities, Schein (2005) found that individual participants reported negative labeling by those outside of the community. While individuals reported positive feelings of association with a unique group, they noted the distinction they felt from the majority. In two studies, participants noted negative feeling of being sheltered and isolated from the campus population and reported that their university experience had been one of handholding (Schein, 2005; Waldron & Yungbluth, 2007). Student participants also noted difficulty integrating into the general population in the residence
halls and classes upon completion of their participation. When moving out of these communities and class cohorts, participants expressed a difficult transition (Schein, 2005). At public institutions, in-state program participants noted greater negative attributions to program participation as isolating them from university experiences than out-of-state participants who indicated it supported their transition (Li et al., 2005). While the outcomes of these programs consistently met objectives, these findings speak to the need to create balance between development of the community and integration into the campus environment such that participants are not sheltered in their experience.

Coordination, support, and consistency of both faculty and staff are found to impact desired outcomes. “Simply enrolling students in common courses does not create learning communities” (Shapiro & Levine, 1999, p. 193). Shapiro and Levine (1999) identify that there has been tremendous inconsistency in the application and the quality and uses of curricula to co-curricular integration in these communities. They note that the roles of both faculty and student affairs professionals becomes critical in achieving outcomes associated with such programs. However, philosophical differences between faculty and leaning community coordinators and attracting interested faculty members has served as the primary challenge in developing such communities.

Several studies have found that many faculty members had difficulty in understanding their position and purpose within the living-learning community and expressed fear about their role within it (Golde & Pribbenow, 2000; Schroeder et al., 1999; Stassen, 2003). Faculty reported, as well, that they had limited understanding of the roles and purposes of student affairs staff and were challenged by the roles each would play in the living-learning community. For example, Hurd and Stein (2004) noted that
faculty was reluctant to support learning community programs because they felt that these communities occurred naturally amongst classroom participants both within and outside the classroom. Faculty felt that the role of student affairs staff was not necessarily related to classroom achievement. Faculty reported, as well, discomfort with entering the residential environment. A great challenge in developing living-learning communities is establishing structure, understanding roles, relationships and organizational systems and forging partnerships between faculty and student affairs administrators (Golde & Pribbenow, 2000; Schroeder et al., 1999; Stassen, 2003). When fear and uncertainty limit the consistent participation of faculty or staff, the success of these programs may be compromised.

Faculty participants have also noted concerns about fair compensation and equitable consideration for participation in these communities. Golde and Pribbenow (2000) found that faculty identified that the time involved for participation in living-learning programs tempered enthusiasm for continued participation. Competing university commitments with little, if any, compensation for faculty restricted their willingness for continued commitment to these programs. In fact, limited compensation or incentives for faculty involvement has been noted as the key limiting faculty enthusiasm for participation and continuation of faculty with these learning communities (Smith, Ward et al., 2004; Stassen, 2003). In addition, faculty raised concerns about the perceived credibility of their role amongst their colleagues. Faculty involved with living-learning programs reported their perceived work with lesser significance or credibility compared to other opportunities on campus that fulfilled tenure criteria (Stassen, 2003). Involvement in learning communities takes tremendous time and efforts and faculty often
face barriers, not rewards for participation (Smith, MacGregor et al., 2004). Hurd and Stein (2004) noted that careful planning and work upon the part of administrators and faculty must be supported through compensation. The work of designing curricular and co-curricular programming, creating courses and developing specialized instruction requires significant time and effort. When consistent, dedicated faculty members are not involved with living-learning programs, desired outcomes for these communities may be significantly limited.

**Summary of Literature Review**

The theories provided by Tinto (1999) and Astin (1993) identify that involvement within the campus environment and engagement with peers and faculty support persistence and academic performance. Entering ability as measured by high school grade point average and entry exam score (i.e., ACT) have been found to be predictive values of measures of academic performance and persistence. Findings suggest as well that residence hall environments provide a supportive environment to promote interactions which enhance student sense of belonging and involvement, particularly in the first year of study. Learning communities partner the co-curricular experience within the academic context and promote deeper learning of academic content while engaging students and their peers in learning processes. Living-learning communities merge these learning community experiences within the residential environments. Research suggests that the evolution of living-learning communities requires on-going research to assess their impact on desired outcomes.
CHAPTER III
METHODOLOGY

Introduction

This study was designed to compare the outcomes associated with participation in living-learning communities, learning communities, traditional curriculum resident students and traditional curriculum commuter students beyond the first year of study. Measured outcomes were cumulative grade point average and cumulative credits completed after five years of study. The study intended to consider differences by academic year and control entering student ability measures of high school grade point average and ACT score as research has suggested their impact upon success measures. This chapter presents the hypotheses and research questions guiding the study. It discusses the data sampling methodology, provides overview of the research design, and identifies similar methodologies utilized in recognized studies. This chapter concludes with highlights of limitations which may impact study outcomes.

Purpose of the Study

The work of Tinto (1999) and Astin (1993) established well that involvement within the campus environment and engagement with peers and faculty support persistence and academic performance. Entering ability as measured by high school grade
point average and entry exam score (i.e., ACT) has been found to be predictive values of measures of academic performance and persistence. Findings suggested as well that residence hall environments provide a supportive environment to promote interactions which enhance student sense of belonging and involvement, particularly in the first year of study. Learning communities partner the co-curricular experience within the academic context and promote deeper learning of academic content while engaging students and their peers in learning processes. Living-learning communities merge these experiences within the residential environments. Living-learning communities provide a direct connection between the academic environment and the co-curricular experience by merging academic content or themes within the student residential environment.

Findings associated with living-learning communities have yielded outcomes including impact upon academic performance and persistence for first year students in their transition to second term and sophomore year of study. Although the design and curricular intensity of such programs varied, Shushok and Siriam (2010) found that the collaborative natures of living-learning communities, regardless of design, with peer interaction as a primary driver yielded positive outcomes. These positive outcomes persisted across majors and program designs. Similarly, Soldner and Szeleny (2008) found that both breadth and depth exist among the variety of living-learning programs that are conducted nationally. They identified an evolving definition of living-learning programs as those which broadly comprised undergraduate participants living together around a centrally derived theme. Regardless of format, positive outcomes have been associated with the first year of study.
Few studies have examined the impact of these programs beyond the first year of study. Specifically, there have been limited studies of the long-term impact of these programs on overall university performance as measured by cumulative grade point average and persistence to graduation. Buch and Spaulding (2008) found that mean grade point average was higher for learning community participants during the first year, but did not find the same effects beyond the first year of study. They did, however, find that the persistence rates were significantly higher beyond the first two years of study. Waldron and Yungbluth (2007) concluded that although longitudinal studies of learning communities are rare, indicators they found suggest these programs support success for some kinds of students. They found that minority students with historically higher dropout rates showed modest success in both persistence and academic performance than non-participants after two years of study. They found that even slight increases over time supported program intent. Inkelas (2008) concluded that although increasing in numbers, living-learning programs have not kept pace in their methods of assessment and that research continues to grow on the benefits of participation beyond the first year of study.

In the fall of 2004 a large, urban, open-access Midwestern university piloted six new living-learning communities in an effort to support student persistence and performance. The pilot study was designed to provide opportunities for enhanced student success in the initial programs. After the initial year, the living-learning communities were continued in following 2005 and 2006 academic years. The living-learning communities were varied in theme and content blending the spectrum of opportunities for the living-learning community. Some programs involved students who were enrolled together in a series of linked or integrated courses and resided together on a residential
floor where the residence hall environment was intended to support the classroom experience, creating informal opportunities for study, advisement, and faculty engagement. Others were centered on student enrollment in a single seminar designed around a theme; this theme carried to activities provided on the floor. The remaining were interest groups drawing on a central theme or interest with intentional co-curricular experiences provided around that theme. Each provided a living environment to support learning experiences, peer mentors, and advisor interventions outside of the classroom. While varying in structure and composition, it was suggested that participation in the living-learning community provided an advantage to students over participants in non-residentially-based learning communities, non-participating resident students, and non-participating commuter students.

In the pilot year and following years, enrollment in the living-learning communities was contingent upon the time at which the student completed their initial orientation at the university. Students were provided the opportunity to select involvement in living-learning communities through their enrollment process at new student orientation. Students in select academic programs were provided option to enroll in these courses as a function of the traditional course enrollment process. Opportunity to enroll may have been limited by course of study or availability of space in such programs at the time of enrollment. Programs centered around a central theme or theme-based seminar were afforded the opportunity to enroll and submit a letter of intent for approval; none were denied admission to the program. For each year, program descriptions and plans as provided by faculty advisors were consistent similar curricular and co-curricular
components. No significant differences were identified by faculty in program execution over the three years.

It was the purpose of this study to explore the differences between these groups five years after participation in the living-learning community for each class 2004, 2005, and 2006 to identify differences in persistence and academic performance while taking academic year into consideration and controlling for entering ability. For the purpose of this study, it was appropriate to provide definition to key terms guiding the study.

Learning communities have been defined 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 with one another and their teachers as fellow participants in the learning enterprise. (Gabelnick et al., 1990, p. 19)

Living-learning communities are characterized as those living arrangements which are comprised of undergraduate participants living together around a centrally derived theme or academic component. Learning community programs are those programs which are comprised of undergraduate courses tied to a central theme which do not incorporate a residential component. Traditional curriculum programs are defined as programs which are not centralized around driving academic focus or theme and are without intentional cohorts. Resident students are defined as those students residing on campus during their first academic year of study. Commuter students are those students not residing in campus residential facilities during their first academic year. Academic year is delineated by the first year of study at the institution including 2004, 2005, and 2006.
Academic success measures utilized in this study were persistence and academic performance. Persistence was measured in terms of cumulative credit hours completed. Academic performance was measured in cumulative grade point average earned. Given the university suggested that average degree completion occurs in five years, it served as the designated time frame for assessment. Research presented in Chapter II outlined two key predicative measures of success in college, high school grade point average and performance on standardized entrance examination like ACT score. High school grade point average provides evidence of prior academic performance at their unique school. ACT score attempts to standardize predicted future performance in the college or university environment. As both high school grade point average and ACT provide different measures of predicted success, taken together they provide a balanced indicator of precollege ability.

Research Questions

This study sought to determine if participation in the pilot year of living-learning communities at a large, open-access, Midwestern, urban institution in 2004, 2005 and 2006 had an impact on performance and retention beyond the first year by yielding difference in academic performance and persistence measures. The study sought to broadly determine, when considering academic year and controlling for entering ability, whether there was a statistically significant difference, on average, in the fifth year of academic performance and retention rates of living-learning community participants, learning community participants, traditional curriculum resident students, and traditional commuter students. Specifically,
• For each entering class 2004, 2005, and 2006, does cumulative grade point average differ among living-learning community participants, learning community participants, traditional curriculum resident students and traditional curriculum commuter students after five years of study when considering academic year and controlling for high school grade point average and ACT score?

• For each entering class 2004, 2005, and 2006, do cumulative credits earned differ among living-learning community participants, learning community participants, traditional curriculum resident students and traditional curriculum commuter students after five years of study when considering academic year and controlling for high school grade point average and ACT score?

**Research and Null Hypotheses**

Research Hypothesis 1: There is a statistically significant difference, on average, in cumulative grade point average among living-learning community participants, learning community participants, traditional curriculum resident students, and traditional curriculum commuter students after five years of study when considering academic year of study and controlling for entering ability as measured by high school grade point average and ACT score.

Research Hypothesis 2: There is a statistically significant difference, on average, in cumulative credits earned among living-learning community participants, learning community participants, traditional curriculum resident students, and traditional curriculum commuter students after five years of study when considering academic year of study and controlling for entering ability as measured by high school grade point average and ACT score.

Null hypothesis 1a: There is no statistically significant difference, on average, in cumulative grade point average among living-learning community participants, learning community participants, traditional curriculum resident students, and
traditional curriculum commuter students after five years of study when considering academic year of study.

Null hypothesis 1b: There is no statistically significant difference, on average, in cumulative grade point average among living-learning community participants, learning community participants, traditional curriculum resident students, and traditional curriculum commuter students after five years of study when considering academic year of study and controlling for entering ability as measured by high school grade point average and ACT score.

Null hypothesis 2a: There is no statistically significant difference, on average, in cumulative credits earned among living-learning community participants, learning community participants, traditional curriculum resident students, and traditional curriculum commuter students after five years of study when considering academic year of study.

Null hypothesis 2b: There is no statistically significant difference, on average, in cumulative credits earned among living-learning community participants, learning community participants, traditional curriculum resident students, and traditional curriculum commuter students after five years of study when considering academic year of study and controlling for entering ability as measured by high school grade point average and ACT score.

**Research Design**

The purpose of this study sought to draw inferences from outcomes derived outside of experimental design. Astin (1991, 1993) presents a model to evaluate the impact of environmental experiences on students. The Input-Environment-Outcome (I-E-O) model serves as a guide in assessing those variables, changes or growth after exposure to an environment. The core of the model draws from paring outcome characteristics with input characteristics after experiencing a specific environment. The I-E-O model defines three essential components of educational assessment. Inputs identify student characteristics typically in skillsets at entry to college. Environment is the intervention or student experience on campus. Outcomes are the skills or ability or experiences educators seek to reach through the environment or campus experience. The model allows
educators to correct or control for input differences when assessing intervention outcomes.

Astin’s (1991, 1993) model provides a useful conceptual model for assessment and has provided framework for a number of studies and from multiple perspectives (Skipper, 2005). For example, Smith, MacGregor et al. (2004) used Astin’s I-E-O as a model for assessment of living-learning communities and delineating community structure. Inkelas and Weisman (2003) utilized Astin’s I-E-O model in and found that outcomes of participants in strongly curricular-based programs were not significantly different than those in less structured system. Li et al. (2005) concluded that Astin’s I-E-O model is useful in explaining the contribution of students’ background characteristics, as well as their academic, physical, and social residential environment toward their overall satisfaction with living in a special program residence hall.

Astin’s (1991, 1993) Inputs-Environment-Outcomes model of assessment suggests causal comparative design with pre- and post-test measures focusing on the differences with the treatment experience (Bresciani, Gardner, & Hickmott, 2009). In this study, the treatment under this assumption is the curricular experience provided. Causal comparative approaches apply in this study as the research is a non-experimental design in which relationships are attempted to be established between groups participating and not participating in the treatment effect that were not manipulated by researcher but had already occurred (Gall, Gall, & Borg, 2003).

In research designs with purpose to explain outcomes through the study of cause and effect, the presumed cause is deemed the independent variable and the presumed effect is identified as the dependent variable. In these studies, the researcher does not
manipulate the independent variable in order to observe the outcome. In this study, however, manipulation of the learning environment does not occur by the researcher. The student self-enrolls in the selected treatment group. Because the analysis of selection is being conducted ex post facto, this study is guided by causal comparative design. While not able to draw strong conclusions regarding direct result, casual comparative research allows for opportunities to explore relationships which may emerge. Causal comparative research is a type of non-experimental investigation in which the researchers seek to identify cause and effect relationships by forming groups of individuals in whom the independent variable is present or absent and determining whether groups differ on the measures of the dependent variable (Gall et al., 2003).

In causal comparative studies, independent and dependent variables are classified uniquely. In these studies the independent variable is treated as a categorical variable (Gall et al., 2003). Independent variables tend to refer to the treatment or the area believed to be of impact whereas dependent variables reflect the effect of such a treatment (Krathwohl, 1998). In attempting to establish relationships, presumed cause, the independent variable yields the presumed effect of the dependent variable (Gall et al., 2003). In this study, the treatments are defined as the curricular format – living-learning community, learning community, traditional curriculum resident student, and traditional curriculum commuter student and the academic year of study 2004, 2005, and 2006.

Inferential statistical analysis may be applied in causal comparative studies and provide insight by analyzing comparable areas from which inferences may be drawn. Analysis of Variance (ANOVA) is an inferential method that compares the amount of between group variance in individuals’ scores with the amount of within groups’
variance. Analysis of variance (ANOVA) is used when more than two groups are exposed with multiple conditions be compared. It allows for the partition of variance in the study that is attributable to each variable. If the ratio of between groups variance to within groups is sufficiently high, this indicates that there is more difference between the groups in the scores on a particular variable than within each group (identified as the F ratio) (Gall et al., 2003). Analysis of variance allows for more precise inference by estimating and removing variance due to factors built into the design. Therefore, it allows more accurate estimate of the error variance and a more powerful design. It allows the testing of the statistical significance of each variable in the design as well as the combined effect of these variables. It avoids the inflation of the probabilities problem that would result when more than two means are compared and independent tests are conducted (Krathwohl, 1998).

ANOVA provides an appropriate framework for this study in that it allows for comparison amongst the categories of treatment. It does not, however, consider those factors which may impact the dependent variable prior to treatment. It has been suggested that pre-college indicators of academic preparedness as measured by high school grade point average and testing score as measured by ACT have been linked to college academic performance. ANOVA does not provide consideration for such predictive factors. The posttest only control group design occurs when participants are randomly assigned to groups, exposed to different treatments and post tested. The posttest scores are the compared to determine the effectiveness of the treatment. The combination of random assignment and the presence of a control group serve to control for all sources of internal invalidity. If there is any chance that the groups may be different with respect to
pretreatment knowledge related to the dependent variable, such advantage may be addressed by covariant analysis (Gay & Airasian, 2000).

Analysis of covariance is used as a technique for controlling for extraneous variables and as a means of increasing power. ANCOVA is a form of ANOVA and is a statistical rather than experimental method that can be used to equate groups on one or more variables. It provides a means of matching groups on variables to be controlled, adjusting posttest scores for initial differences on a variable and adjusts the compared scores. Groups are equalized for the control variables such that any variable that is correlated with the dependent variable can be controlled for using covariance. Using covariance attempts to reduce variation in the posttest score that may be attributed to another non-treatment variable. In casual comparative studies the researcher cannot always select comparison groups that are matched with respect to all relevant variables except the one that is the main concern of the investigation (Gall et al., 2003). ANCOVA as a control is useful in causal comparative studies in which already formed by not necessarily equal groups are involved in experimental studies in which either existing groups or randomly formed groups are included (Gay & Airasian, 2000). The effect of ANCOVA is to make the two groups equal with respect once or more control variables. If a difference still remains between the two groups, the control variables cannot be used to explain the effect (Gall et al., 2003).

In this study it has been noted that high school grade point average and ACT score have been linked to college academic performance measures. High school grade point average evidences prior academic performance under a specific institution scale. ACT score provides a standardized measure of predicted performance in the university
environment. Taken together as predictors, and therefore, covariates, these measures utilize both prior and predicted performance. College academic performance as measured by cumulative grade point average and cumulative credits completed as measure of persistence served as the dependent variables. Any variable that should theoretically correlate with the dependent variable or that have been shown to correlate with the dependent variable on similar types of subjects should be considered as possible covariates (Mertler & Vannatta, 2005). To this end, central to this study were the covariates of high school grade point average and ACT score; the independent variables or treatments of curricular format as noted as living-learning community, learning community, traditional resident student, and traditional commuter student, and academic year of study, and the outcome success measures or dependent variables of cumulative grade point average and cumulative credits earned. Mertler and Vannatta (2005) noted that when looking to identify differences between groups where one quantitative dependent variable (credits earned or grade point average), two independent categorical variables with more than two classifications (living-learning community, learning community, traditional resident, and traditional commuter; 2004, 2005, and 2006); and covariates (high school grade point average and ACT score) exist, the Two-way Analysis of Covariance may serve as an acceptable tool. Two-way analysis of covariance controls for a variable which may influence the dependent variable and removes the associated effects driving response to the focus of this study. The variables are summarized in Table 2 and research design in Table 3.
Several studies have utilized ANOVA and ANCOVA in analysis of outcomes associated with learning experiences. In a study of the impact on first year student employment and academic achievement, Pike et al. (2008) utilized analysis of variance and analysis of covariance tests because they were appropriately robust to determine if there were differences in grade performance with consideration of background
characteristics and prior academic performance as covariates. Pike (1999) examined the impact of living-learning communities as compared to traditional arrangements by developing a model which assumed that students’ gains were associated with background characteristics, involvement, and integrations. In looking to background characteristics, analysis of variance was utilized to identify significances of group means. To establish and control for predictive measures an analysis of covariance was utilized to establish stability of relationships among components which may impact student outcomes. In another study of living-learning communities, Edwards and McKelfresh (2002) used analysis of covariance to identify estimated means for significant effects on persistence while controlling for related variables. Garrett and Zabriskie (2003) followed the methodology used by Inkelas and Weisman (2003) to explore differences in living-learning community subpopulation by utilizing analysis of covariance tests to identify statistically significant differences in survey responses from subpopulations including student participants, resident non-participants, and resident non-participants in halls with communities. These studies and others suggest that the analysis of covariance methodology provides opportunity for stronger analysis to draw inferences and is therefore an appropriate approach for this study.

Data Collection

Causal comparative design and the use of inferential statistics were appropriate for this study because the driving focus of the study was to determine if participation in programs impacted academic performance beyond the first year of study. All of the data used in this study were obtained from institutional records. Data obtained from
institutional records included two background variables: (a) entering ability (ACT composite score) and (b) high school grade point average. Data obtained as performance indicators included (a) cumulative grade point average and (b) persistence in cumulative credit hours completed. The data focused upon the first time, full time students enrolled at the university and their subsequent scores five years post-participation in the treatment or curricular community as identified – living-learning community, learning community, traditional curriculum resident, and traditional curriculum commuter. The dataset was analyzed utilizing a Statistical Package for Social Sciences (SPSS) software to test the null and research hypotheses in this study. After the data were analyzed, an assessment of difference between groups was noted in the context of anticipated impact of participation in the curricular programs.

Participants

This study was conducted utilizing data collected from a large, public Midwestern urban university. The data incorporated information received regarding the entering classes of 2004, 2005, and 2006 for first time-full time students. Excluded from this study were part-time students and post-secondary students as they would have been ineligible to participate in residential living, living-learning communities or learning communities.

In 2004, 2,704 first-time, full-time college students matriculated at the university; 1,288 were resident students and 1,416 were commuter students. Of the class, 316 were enrolled in learning communities, 96 were enrolled in living-learning communities, and 2,292 were traditionally enrolled students. In 2005, 2,770 first-time, full-time college students matriculated at the university; 1,391 were resident students and 1,379 were
commuter students. Of the class, 393 were enrolled in learning communities, 128 were enrolled in living-learning communities, and 2,249 were traditionally enrolled students. In 2006, 3,320 first-time, full-time college students matriculated at the university; 1,646 were resident students and 1,674 were commuter students. Of the class, 524 were enrolled in learning communities, 177 were enrolled in living-learning communities, and 2,619 were traditionally enrolled students.

Students enrolled in living-learning community and learning community programs as part of the university orientation and registration process. Participation in most programs was based upon interest, appropriateness of major to program, and availability of courses. For each year, program descriptions and plans as provided by faculty advisors were consistent similar curricular and co-curricular components. No significant differences were identified by faculty in program execution over the three years.

As the size of learning community and living-learning community sections were small, students were afforded the opportunity to self-select into programs. Opportunity to enroll may have been limited by course of study or availability of space in such programs at the time of enrollment. As the size of the living-learning community populations provided a significantly smaller comparative sample to analyze, random samples of matching size were selected from the larger treatment groups for each entering class. Individual living-learning communities were not studied independently because of the small sample size associated with each community. This study did not analyze students by major because some living-learning programs were not exclusive by major and because student majors may change frequently between the beginning of their academic
career and conclusion of their career. Finally, the study does not represent those students who may have transferred to other institutions to complete their academic career.

**Structure of Living-learning Communities**

Classifying the intensity, degree, or composition of living-learning communities provides a spectrum of interpretation of program development and impact. Inkelas (2008) notes, “Indeed perhaps the only aspect all living-learning programs across the nation share is that they primarily housed in residence halls. Otherwise, they vary in size, structure, mission, staffing, theme, funding, academic rigor, and a host of other facets” (p. 9). Soldner and Szeleny (2008) present that the National Study of Living-learning Programs broadly identifies living-learning communities as those which undergraduate students live together in a portion of a residence hall and participate in academic or extracurricular programming especially for that group. In a study of more than 613 living-learning programs, Soldner and Szeleny (2008) concluded that differentiation seemed to be the norm rather than the exception. The large variety poses challenges in creating delineating lines of the caliber of living-learning programs.

Shapiro and Levine (1999) note that all learning communities have gradients of four critical components: curricular structure, faculty role, co-curricular opportunities, and opportunities for peer leadership. Curricular structure represents how courses and students are organized in the community. Faculty role represents the degree of faculty involvement in collaborating with curricular integration or co-curricular involvement. Co-curricular programs represent the degree of integration of in- and out-of-class experiences. Opportunities for peer leadership represent the degree of involvement and
sophistication of peer staffing. The curricular component of residentially-based living-learning programs typically involves learning clusters, freshman interest groups, or team-taught programs. Team-taught programs enroll students in two or more classes organized around a central theme. Clustered courses link individually taught courses through a cohort or block scheduling. Freshman interest groups are the simplest in organization and cost and involve creating subgroups of students in enrolled in larger courses or around a central theme (Levine-Lauffgraben & Shapiro, 2004). Hurd and Stein (2004) note that faculty involvement may be limited to course oversight and as embedded to in hall engagement and collaboration. Peer leadership may range from in-hall staff to specialized upper class student involved in specific majors and programs. Co-curricular engagement may range from distinct curricular activities involving speakers, academic support, service, and social projects to informal social engagement balancing the curricular experience.

Smith, MacGregor et al. (2004) concluded that there is considerable variability in living-learning community programs when it comes to focus, duration, type of faculty involvement, type of coursework, and administrative oversight. Given the wide range of intensity possible in the design of living-learning programs, classifying these programs and their intensity discretely provides challenge. Love and Tokuno (1999) have developed a method for mapping learning communities on a continuum of a number of relevant dimensions. The framework includes five dimensions considering degrees of: (1) student collaboration, (2) faculty collaboration, (3) curricular coordination, (4) shared setting, and (5) interactive pedagogy. In application of this model, Stassen (2003) utilized a sixth dimensional characteristic reflecting degree of shared identity. Peer interaction is
noted around activities around academic work. Faculty interaction is noted as interaction outside the classroom. Curricular coordination refers to the positive development of a co-curricular environment.

The combination of Love and Tokuno (1999) and Stassen (2003) continuum is shown in Table 4. Embedded in the table are the living-learning communities for the selected term (2004, 2005, 2006) and the enrollment in respective community.

Table 4
Continuum of Living-learning Communities for 2004, 2005, and 2006

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Low focus</th>
<th>Medium focus</th>
<th>High focus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Collaboration</td>
<td>Communications- (7, 12, 29)</td>
<td>Education- (12, 9, 0)</td>
<td>Business- (15, 16, 51)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Emerging Leaders I&amp;II- (43, 72, 58)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Nursing- (19, 19, 39)</td>
</tr>
<tr>
<td>Faculty Collaboration</td>
<td>Communications- (7, 12, 29)</td>
<td>Education- (12, 9, 0)</td>
<td>Emerging Leaders I&amp;II- (43, 72, 58)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Business- (15, 16, 51)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Nursing- (19, 19, 39)</td>
</tr>
<tr>
<td>Curricular Coordination</td>
<td>Communications- (7, 12, 29)</td>
<td>Education- (12, 9, 0)</td>
<td>Business- (15, 16, 51)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Emerging Leaders I&amp;II- (43, 72, 58)</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Nursing- (19, 19, 39)</td>
</tr>
<tr>
<td>Shared Setting</td>
<td>Communications- (7, 12, 29)</td>
<td>Education- (12, 9, 0)</td>
<td>Emerging Leaders I&amp;II- (43, 72, 58)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Business- (15, 16, 51)</td>
</tr>
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<td></td>
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<td></td>
<td>Nursing- (19, 19, 39)</td>
</tr>
</tbody>
</table>
Table 4

Continuum of Living-learning Communities for 2004, 2005, and 2006 (continued)

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Low focus</th>
<th>Medium focus</th>
<th>High focus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group Identity</td>
<td>Education- (12, 9, 0)</td>
<td>Business- (15, 16, 51)</td>
<td>Emerging Leaders I&amp;II- (43, 72, 58) Nursing- (19, 19, 39)</td>
</tr>
<tr>
<td></td>
<td>Communications- (7, 12, 29)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interactive Pedagogy</td>
<td>Communications- (7, 12, 29)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Education- (12, 9, 0)</td>
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</tbody>
</table>

Sampling

This study examined four populations of disproportionate size for each year. Utilization of stratified sampling methods addressed this concern. Stratified sampling is the process of selecting a sample in such a way that the identified subgroups on the population are represented in the same proportion. The purpose of stratified sampling is to guarantee desired representation of relevant subgroups within the sample. To establish a proportional stratified sample the overall population is defined, desired matching sample sizes are established, sub groupings are identified, and an appropriate number of individuals from each subgroup are randomly selected with appropriate being defined as equal numbers of individuals (Gay & Airasian, 2000). Equal sized samples are most useful in comparing the performance of different subgroups. Proportional stratified sampling allows populations to be sorted into groups based upon identifying characteristics and random selections from each of such criteria into equal numbers to the
categories in comparison. It ensures the samples are representative of classifying characteristics and creates greater homogeneity in each classification and allows to be represented by fewer cases. If size is retained among categories, greater accuracy is gained and more confidence in estimates is achieved (Krathwohl, 1998).

As the living-learning communities are the smallest sub-populations for each academic year compared to the traditional curriculum student population, concerns of power and effect size may arise. Statistical power refers to the probability that a test of statistical significance will lead to rejection of a false null hypothesis. Power refers to the statistical ability to reject a false null hypothesis that is to make a correct decision to reject the null hypothesis. Sample size, level of significance, directionality, and effect size impact the power of the findings. Power can increase by reducing the standard error by increasing the sample size. A power analysis shows the sample size need for adequate sensitivity and is the good way to determine a big enough sample size (Krathwohl, 1988). Determining the level of significance is driven by desired power levels, but in practice .05 tends to be used frequently in social science research (Krathwohl, 1998).

Analysis of Covariance (ANCOVA) increases the power of a statistical test by reducing within-group error variance. Although increasing sample size also increases power, ANCOVA can reduce random sampling error by equating difference groups. The power-increasing function of ANCOVA is directly related to the degree of randomization involved in the formation of the groups (Gay & Airasian, 2000). Covariate analysis adjusts for initial group differences and removes initial advantages so that the results will be fairly compared, providing equal starting points for groups. Supporting this approach, Johnson and Romanoff (1999) utilized a matched, randomly selected control group to
analyze the Russell Scholars program. Profiles and participation levels allowed for sufficient equivalent populations to be drawn. Given the significant variation in population sizes associated with this study, controlling for entry characteristics allows for greater levels of confidence in response information and results.

Effect size is the estimate of the magnitude of the difference, relationship or effect in the population being studied. The greater the scores depart from the null hypothesis, the greater the effect size. As the sample size increases, significance level and effect size increase with the power of the significance test. Increasing the significance level increases the power by making it easier to reject the null hypothesis. (Gay & Airasian, 2000). Gall et al. (2003) indicate that researchers are more likely to obtain a large effect size in a sample when there is large effect size in the population. Conventionally agreed upon definitions of small medium and large effect sizes can be chosen (Gay & Airasian, 2000). Prior research has suggested that the effect may be of medium size, minimum total sample guidelines for Analysis of Covariance of medium effect size with power of .5 suggest populations of 63 or greater and 96 or greater for power of .7, given the groups of living-learning community size of 96, 128, and 177, the combined sample size of 401 should be sufficient to provide necessary effect size (Gall et al., 2003).

**Description of Measurements**

There were two measures used in this study for comparison of student success outcomes – academic performance and persistence. Academic performance was measured by cumulative earned grade point average during the student academic career. Grade point average was measured at the university on a 4 point continuous scale and
reflected summative grades earned throughout coursework. Persistence was measured by cumulative credits earned during the academic career. Persistence assumed that the greater number of credits accumulated, the greater number of terms persisted at the institution. In addition, there were two covariates identified as contributing to these measures – high school grade point average and ACT composite score. Demographic data of gender and race was collected in the data set.

There were several studies which guided these definitions and descriptions of measurement. In two different studies of living-learning communities Edwards and McKelfresh (2002) and Reason (2009) defined persistence as to whether or not a student continued enrollment beyond the initial term of enrollment. Schroeder et al. (1999) examined student academic records to identify whether participation in living-learning programs was associated with higher levels of academic achievement and persistence from the first to second term of study than those that did not participate. Waldron and Yungbluth (2007) measured academic performance by calculating student GPA and credit hour completion after the first semester, at the end of the first academic year, and at the end of the second academic year. Retention figures were calculated after the first semester and prior to the beginning of the second academic year. This approach allowed them to determine whether the effects persisted well after the learning community treatment. Analysis of covariance measures were utilized to assess pretest variables associated with retention and academic performance. To this end, grade point average and cumulative credits earned support the defined measures of this study.

Academic preparedness as measured by precollege characteristics of high school grade point average and entrance examinations like ACT supported this study’s
definitions and their use as covariates as well. In a study examining the differences in
critical thinking development for resident and commuter students, Inman and Pascarella
(1998) utilized precollege characteristics and abilities, residential status, and college
environment as basis for analysis. In identifying determinants of persistence for first
generation college students Lohfink and Paulsen (2005) identified first to second year
persistence as dependent variable and considered precollege characteristics including
standardized test scores like ACT and high school performance. In a study of the impact
on first year student employment and academic achievement, Pike et al. (2008) equated
SAT scores to ACT scores and utilized them as a measure of entering ability. Pike (2002)
studied the impact of on campus living where the background variables were identified as
gender, minority status, and entering ability score from ACT. Hansen, Meshulam, and
Watson (2010) utilized analysis of covariance procedure to control for preparation
measures including high school grades and SAT score when assessing outcomes
associated with a math learning community. Reason (2009) indicated that level of
achievement in high school as reflected in grades and college admissions tests served as
predictors of retention. Reason cited several studies which support the assertion under
multiple study formats. Blimling (1999) found that merely comparing student groups, for
example, resident and commuter, was not sufficient in drawing conclusions about levels
of academic performance. The study found that controlling for differences in past
academic performance were incorporated into the study significant differences were
found in the outcomes. The consistency in use of grade point average and persistence as
measured in credit completion supported their use in this study. Likewise, covariate
measures of high school grade point average and ACT score have been identified by the
research to be linked to success measures and serve well to be controlled in the analysis to assess impact of curricular participation.

**Evidence of Methodology in Literature**

There are a number of studies which guided the philosophy and methodological approach of this study. Inkelas and Weisman (2003) conducted a study of various types of living-learning programs to address the effects of participation in a single program on study outcomes. Their study compared outcomes of living-learning participants to non-participating students but also studied the outcomes associated with different types of living-learning programs to determine whether participation in programs supports the outcomes associated with these programs. They identified that a commonly noted criticism in prior research on outcomes associated with living-learning communities suggests that the outcomes may be less related to the college or program and more related to the innate abilities and preferences that elect to participate in such programs. Utilizing the college impact model identified by Astin (1991), they identified the impact of pre-college characteristics of student participants. They indicated that at their core, nearly all living-learning programs comprise the critical elements associated with Astin’s (1991) model. Inkelas and Weisman (2003) concluded that existing research fails to take into account the inherent distinctions among students before they enter college and may overestimate the effects of living-learning communities on student outcomes. Utilizing a stratified random sample, the study differentiated between community participants and non-participants. Analysis of variance measures were utilized to discern significant
difference in the outcome areas. They noted as well that deficit exists in analysis of programs beyond the first year of study (Inkelas & Weisman, 2003).

Stassen (2003) also drew from these frameworks to explore the extent to which learning communities facilitate student social and academic integration into the university environment. The study explored the primary student success outcomes (academic performance and persistence) and also experiential outcomes. The study was conducted at a large, public research institution and focused on three unique living programs varying from intensive format to interest group. The format and component via academic integration versus interest capacity not only varied on construct but component. Two of the programs were selective in their admission process and the third open on a first come first serve basis. All programs centered on students living in a common residence hall and having shared experiences; however, the nature of the shared experiences varied from linked courses, collective course work and shared interest without academic integration. To examine the impact, Stassen (2003) focused on the input, environment, and output components that Astin (1991) highlighted as critical to consider in any assessment of institutional effectiveness and analyzed the effects of different models on a set of student success outcomes (academic performance and one-year retention) and on student experiences directly related to the underlying goals of the community. Initial data analysis focused on indicators as direct measures of succession terms of performance. Longitudinal student database information was utilized to document student’ entering characteristic and preparation and track their performance over the course of the first year. Analysis of variance measures were used to compute the groups on specific variables. Analysis of variance and covariance measures were utilized to examine group
differences. It was found that all programs regardless of degree of complexity and integration had significant positive effects on first year academic performance and persistence. It was found that even the most moderately structured interest group had a significant impact on those students identified as at risk. Like Inkelas and Weisman (2003), Stassen (2003) indicated that the study focused on the significance of the impact on the first year of study and did not explore long term outcomes associated with program participation.

In examination of the impact participation beyond the first year of study, Potts and Schultz (2008) examined the impact of participation in freshman seminar communities on student success. Potts and Schultz (2008) identified participants in learning communities as a treatment group and non-participants as control. They identified that there were several factors beyond participation that may impact academic performance and retention and controlled for measures specifically associated with ability—high school GPA and performance on ACT. Their hypothesis centered on mean performance in terms of grade point average after eight terms of study and retention rate after eight terms of study for each of the groups. They utilized analysis of covariance methods to identify these differences among the groups. In a study to examine the long term impact on student experiences, Zabriskie and Garrett (2004) utilized a data set which included the information gathered from three success academic terms and three populations: students participating in living-learning programs; students not participating in living-learning programs but residing in halls in which they were present; and students residing on campus not participating in these programs or living in proximity to them. Sidle and McReynolds (2009) also conducted an ex post facto investigation of the
freshman year experience on student success. They studied the progress of student participants in the program each year for five years. These studies support the need to examine impact beyond the first year of study.

The studies conducted by Stassen (2003), Inkelas and Weisman (2003), and Potts and Schultz (2008) supported the approach adopted for this study. The work of Zabriski and Garret (2004) and Sidle and McReynolds (2009) established the need and practice of examining beyond the first year of study. Their frameworks studied the impact of participation in learning communities on measured outcomes of success while considering pre-college characteristics in each. Both Stassen (2003) and Inkelas and Weisman (2003) noted that further study was necessary beyond the first year of study to address long-term impact of program participation. Potts and Schultz (2008) identifying this need attempted to analyze impact after two years of study. Zabriski and Garret (2004) and Sidle and McReynolds (2009) established practice in studying impact through academic career. Taken together, consideration of pre-college ability, utilization of grade point average and cumulative credits earned, analysis of outcomes beyond the first year of study are supported by prior research. Similarly, the use of proportional stratified sampling and analysis of covariance are accepted approaches in drawing inferences about outcomes associated with participation in living-learning programs.

**Limitations**

There are several factors which may impact the outcomes of this study. Three are prevalent in the research: utilization of grades as measure of success, the potential for selection bias of those choosing to enroll in living-learning communities, and, concerns
Reliance on grades as a measure of achievement may serve as limitation to studies regarding student success. While seen as the best measure in determining academic success in the context of progression toward degree completion, concerns have been raised with regard to their equation to student success as broadly defined. Differences in grading practices among courses and institutions may impact the outcomes associated with studies utilizing them as a measure of academic success (Pike et al., 2008). The purpose of this study was to note differences amongst groups at one institution, and to this end, it was assumed that they served as relative predictors of progression towards graduation.

Concerns have been raised in similar studies regarding the predisposition of students enrolling in such programs and propensity toward academic success. Waldron and Yungbluth (2007) indicated that students were assigned to one of the conditions during the registrations sessions. Assignment was not random but based upon student scheduling ability and availability of communities and courses. Hotchkiss, Moore, and Pitts (2006) utilized a standard treatment effects model to determine if participation in freshman learning communities improves academic performance and retention. In their study, consideration was given to controlling for the self-selection impact on the outcomes. They indicated that assessment of program where students select to participate is complex if the students’ choice to participate was correlated with the outcome measure evaluation of the impact of the program based on raw mean comparisons may be inaccurate, with self-selection contaminating the outcome measures. They concluded that
pretest measures impacted likelihood of self-selection and found a correlation between those factors that determine participation and GPA with students who are less likely to perform well as more likely to enroll in such communities. Isolating those less likely to perform well yielded greater measurable gains than holding participants constant. It is anticipated that the analysis of covariance measures established in this study will address the concerns identified by self-selection based upon the findings of Hotchkiss et al. (2006).

A final concern for this study is the issue of sample size and discrepancy between sub-group sizes. Waldron and Yungbluth (2007) indicated that many of the sample sizes present are increasingly small, relatively few studies compare program participants with equivalent students participating in other programs, and that few longitudinal studies that exist frequently examine beyond their period of once semester or the first year, and fewer of those examined measures of persistence and grade point average (Waldron & Yungbluth, 2007). They used a quasi-experimental longitudinal design to address this concern. The assignment to learning community and non-learning community conditions was not randomized but the equivalence of these groups was established through existing pre-testing measures. Outcome measures were taken after completion of the first semester, first academic year, and second academic year. Through proportional stratified sampling design it was anticipated that some of the concern regarding sample size may be addressed.
Summary of Methodology

The purpose of this study was to analyze the outcomes associated with four different types of curricular structure beyond the first year of study. Living-learning communities, learning communities, and residential status have been shown to have an impact upon student success during the first year of study. Academic year cohorts were considered in this study. Cumulative grade point average and cumulative credits earned served as measures of student success in this study. Pre-college attributes of high school grade point average and ACT score have been identified as predictors of college success and were therefore controlled in the analysis. Data were collected regarding student performance, program participation and pre-college attributes and analyzed utilizing analysis of variance (ANOVA) and analysis of covariance (ANCOVA). A Statistical Package for Social Sciences (SPSS) software was utilized to infer impact on participation amongst the four groups.
CHAPTER IV

RESULTS

Introduction

This study sought to determine if participation in the pilot years of living-learning communities at a large, Midwestern, urban institution in 2004, 2005 and 2006 had an impact on performance and retention through the course college career by yielding differences in academic performance and persistence measures. This study also sought to broadly determine, when considering academic year and controlling for entering ability, whether there was a statistically significant difference, on average, in the fifth year of academic performance and retention rates of living-learning community participants, learning community participants, traditional curriculum resident students, and traditional commuter students.

In this chapter, the data for this study are presented and analyzed. First, sample size and demographic features of the subjects are discussed. Screening and sample selection of the participants are then presented. Each research question and the results of the hypothesis testing are then presented.
Participant Profile

The participants in this study were first-time, full-time students who enrolled in four-year degree programs in 2004, 2005, and 2006. This study was conducted utilizing data collected from a large, public Midwestern urban university. The data incorporated information received regarding the entering classes of 2004, 2005, and 2006 for first-time, full-time students. Excluded from this study were part-time students and post-secondary students as they would have been ineligible to participate in residential living, living-learning communities or learning communities.

In 2004, 2,704 first-time, full-time students matriculated at the university. Excluded from this study were part-time students, students enrolled in two-year degree programs, and post-secondary students. Of the four-year program students, 1,288 were resident students and 1,416 were commuter students. Of the class, 316 were enrolled in learning communities, 96 were enrolled in living-learning communities, and 2,292 were traditionally enrolled students. In 2005, 2,770 first-time, full-time college students matriculated at the university; 1,391 were resident students and 1,379 were commuter students. Of the class, 393 were enrolled in learning communities, 128 were enrolled in living-learning communities, and 2,249 were traditionally enrolled students. In 2006, 3,320 first-time, full-time college students matriculated at the university; 1,646 were resident students and 1,674 were commuter students. Of the class, 524 were enrolled in learning communities, 177 were enrolled in living-learning communities, and 2,619 were traditionally enrolled students.

Students enrolled in living-learning community and learning community programs as part of the university orientation and registration process. Participation in
most programs was based upon interest, appropriateness of major to program, and availability of courses. As the size of learning community and living-learning community sections were small, students were afforded the opportunity to self-select into programs. Opportunity to enroll may have been limited by course of study or availability of space in such programs at the time of enrollment. Programs centered around a central theme or theme-based seminar. Students were afforded the opportunity to enroll, and submit a letter of intent for approval; none were denied admission to the program. For each year, program descriptions and plans as provided by faculty advisors were consistent similar curricular and co-curricular components. No significant differences were identified by faculty in program execution over the three years. Excluded from this study were part-time students and post-secondary students as they would have been ineligible to participate in residential living, living-learning communities or learning communities.

Because this study focused on differences between curriculum types, students were arranged according to the curriculum group reflective of their enrollment: (a) students who participated in living-learning communities; (b) students who participated in learning communities; (c) students who resided on-campus and participated in traditional curriculum programs; (d) and students who resided off-campus and participated in the traditional curriculum programs. Students were also arranged based upon their entering academic year of study: (a) 2004, (b) 2005, and (c) 2006. As the size of the living-learning community population provided a significantly smaller comparative sample to analyze, random samples of matching size were randomly selected from the larger treatment groups to make the group sizes more comparable for the purposes of analysis.
After the random sample was selected, there were 386 participants for 2004, 515 for 2005, and 710 for 2006 used in this study. Living-learning communities had 96, 128, and 177 participants for each year respectively. Learning communities had 97, 129, and 177 participants respectively. Traditional curriculum residents had 96, 129, and 178 participants. Traditional curriculum commuter students had 97, 129, and 178 participants. Taken together, there were 1,611 participants in the study. Of those, 401 participated in living-learning communities, 403 in learning communities, 403 traditional curriculum residents, and 404 traditional curriculum commuters. Table 5 provides detail by curriculum type.

In 2004, 51% of the participants were male and 49% were female. Seventy-nine percent of the population was Caucasian, 17% African American, 2% Asian, and 2% other. Of the 96 participants in living-learning communities, 44% were in the two Emerging Leaders communities, 20% were in the Nursing community, 16% were in the Business community, 13% were in the Education community, and 7% were in the Communications community. In 2005, 47% of the participants were male and 53% were female. Seventy-four percent were Caucasian, 19% African American, 2% Asian, and 5% other. Of the 128 participants in living-learning communities, 56% were in Emerging Leaders communities, 15% were in the Nursing community, 13% were in the Business community, 7% were in the Education community and 9% were in the communications community. In 2006, 48% of the participants were male and 52% were female. Seventy-eight percent were Caucasian, 15% African American, 3% Asian, and 4% other. Of the 177 participants in living-learning communities, 33% were in Emerging Leaders communities, 22% were in the Nursing community, 29% were in the Business
community and 16% were in the communications community. In 2006, the Education community did not operate as result of loss of support from the academic unit.

The preadmission characteristics of the subjects as measured by ACT score and high school GPA and cumulative credits earned and cumulative grade point average are displayed in Table 5. The ACT scores for living-learning communities were slightly higher than other groups which were fairly comparable. Living-learning communities had slightly higher high school GPAs as compared to learning communities, traditional curriculum residents, and traditional curriculum commuters. Cumulative credits earned for living-learning communities and traditional curriculum residents were higher than learning communities and traditional curriculum commuter. Earned college cumulative grade point average was also higher for living-learning communities and traditional curriculum residents over learning communities and traditional curriculum commuters.

The preadmission characteristics of the subjects in respective living-learning communities as measured by ACT score and high school GPA and cumulative credits earned and cumulative grade point average are displayed in Table 6. For each year, Emerging Leaders, Business, and Nursing had higher high school grade point averages while ACT scores were relatively consistent for each group. Emerging leaders earned higher ACT composite scores while other groups remained relatively consistent. As the sample size of each individual community was small, differences between communities were not explored in this study.
Table 5

Mean Scores and Standard Deviations of Pre Admission Scores, Cumulative Credits Earned, and Cumulative Grade Point Average by Curriculum Type

<table>
<thead>
<tr>
<th></th>
<th>LLC Mean</th>
<th>LLC Standard deviation</th>
<th>LC Mean</th>
<th>LC Standard deviation</th>
<th>TC Resident mean</th>
<th>TC Resident Standard deviation</th>
<th>TC Commuter mean</th>
<th>TC Commuter Standard deviation</th>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>2.98</td>
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<td>2.91</td>
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<td>20.06</td>
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<td>20.85</td>
<td>3.87</td>
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<td>Cum. credits</td>
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<td>85.12</td>
<td>59.14</td>
<td>77.86</td>
<td>57.73</td>
</tr>
<tr>
<td>Cum. GPA</td>
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<td>0.88</td>
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<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>HS GPA</td>
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<td>3.03</td>
<td>0.64</td>
<td>3.08</td>
<td>0.62</td>
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<tr>
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<td></td>
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<tr>
<td>ACT score</td>
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<td>4.63</td>
<td>20.76</td>
<td>4.59</td>
<td>21.59</td>
<td>4.09</td>
<td>20.24</td>
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<tr>
<td>Cum. credits</td>
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<td>2.73</td>
<td>0.85</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HS GPA</td>
<td>3.24</td>
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<td>3.03</td>
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<td>0.65</td>
<td>2.92</td>
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</tr>
<tr>
<td>Cum. GPA</td>
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<td>1.09</td>
<td>2.69</td>
<td>0.88</td>
<td>2.20</td>
<td>1.19</td>
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Table 6

Mean Scores and Standard Deviations of Pre Admission Scores, Cumulative Credits Earned, and Cumulative Grade Point Average by Living-learning Community Type

<table>
<thead>
<tr>
<th></th>
<th>HS GPA</th>
<th>ACT SCORE</th>
<th>CUM. CREDITS</th>
<th>CUM. GPA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>Standard Deviation</td>
<td>Mean</td>
<td>Standard Deviation</td>
</tr>
<tr>
<td>2004</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emerging Leaders-43</td>
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<td>.68</td>
<td>24.04</td>
<td>5.12</td>
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<tr>
<td>Business-15</td>
<td>3.05</td>
<td>.54</td>
<td>20.39</td>
<td>2.26</td>
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<tr>
<td>Communications-7</td>
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<td>.61</td>
<td>20.27</td>
<td>2.43</td>
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<td>Education-12</td>
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<td>.54</td>
<td>17.75</td>
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<td>Emerging Leaders-72</td>
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<td>5.27</td>
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<td>20.77</td>
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<td>21.37</td>
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</tbody>
</table>

Preliminary Data Screening

Initial descriptive statistics were conducted on the entire data set. There were 2,704 first-time, full-time students enrolled in four-year programs in the fall of 2004, 2,770 in 2005, and 3,320 in 2006. No missing values were identified for categorical values. For each year, less than 5% had missing values for high school GPA or missing ACT score. Missing values were replaced with the series means. Data were then screened for outliers and extreme values. Data were then separated by curriculum type (living-
learning community, learning community, traditional curriculum resident, and traditional curriculum commuters) and academic year (2004, 2005, and 2006).

Ninety-seven students participated in living-learning communities in the fall term of 2004. Equal size samples of 97 were randomly selected using randomization numbers from each of the larger curriculum categories. One hundred twenty-eight students participated in living-learning communities in the fall term of 2005. Equal size samples of 128 were randomly selected using randomization numbers for each of the larger curriculum categories. One hundred seventy-seven students participated in living-learning communities for fall term of 2006. Equal size samples of 177 were randomly selected using randomization numbers from each of the curriculum categories. The new data set contained equal representation from each of the curriculum categories and yielded a total population of 1611 for the study.

Descriptive statistics were conducted to screen for outliers. Stem-and-leaf plots were utilized to identify extreme values. Cases were eliminated for non-sense making values. Outliers identified for cumulative credits earned and for cumulative grade point average were substituted with the low range score. After substitutions were made, descriptive statistics and stem-and-leaf plots were again conducted. No outliers were identified in this evaluation of the data.

To test for normality, descriptive statistics with normality plots were conducted. Mertler and Vanata (2005) noted that skewness and kurtosis values should fall within the range of -1.00 to +1.00. George and Mallery (2009) noted that a range of -2.00 to +2.00 for kurtosis values may be acceptable for certain studies. For 2004, skewness values for cumulative credits earned ranged from -.240 to +.274. Kurtosis values for cumulative
credits earned ranged -1.670 to -1.293. Skewness values for cumulative grade point average ranged from -.737 to -.541. Kurtosis for cumulative grade point average ranged from -.848 to -.178. Kolmogorov-Smirnov tests for normality significantly rejected normality for cumulative credits earned for all groups. For 2005, skewness values for cumulative credits earned ranged from -.423 to .141. Kurtosis values for cumulative credits earned ranged -1.674 to -1.286. Skewness values for cumulative grade point average ranged from -.985 to -.565. Kurtosis for cumulative grade point average ranged from -1.133 to +.232. Kolmogorov-Smirnov tests for normality significantly rejected normality for cumulative credits earned and cumulative grade point average for all groups. For 2006, skewness values for cumulative credits earned ranged from -.487 to +.284. Kurtosis values for cumulative credits earned ranged -1.536 to -1.314. Skewness values for cumulative grade point average ranged from -.874 to -.497. Kurtosis for cumulative grade point average ranged from -.906 to -.094. Kolmogorov-Smirnov tests for normality significantly rejected normality for cumulative credits earned and cumulative grade point average for all groups.

For the composite population, skewness values for cumulative grade point average ranged from -.884 to -.601 by curriculum type, with kurtosis values ranging from -.823 to .125 by curriculum type. Skewness for cumulative grade point average ranged from -.815 to -.801 by academic year with kurtosis values ranging from -.372 to .079. For the composite population, skewness values for credits earned ranged from -.397 to .197 by curriculum type, with kurtosis values ranging from -1.550 to 1.507 by curriculum type. Skewness for credits earned ranged from -.065 to .017 by academic year with kurtosis values ranging from -1.577 to -1.514. After screening subject populations for
2004 were 386, for 2005 were 515, and for 2006 were 710. Kolmogorov-Smirnov tests for normality significantly rejected normality for cumulative credits earned and cumulative grade point average for all curriculum groups and all academic years.

**Research Questions and Hypothesis Testing**

An initial test of difference Univariate Analysis of Variance (ANOVA) was conducted to assess differences amongst groups prior to controlling for entering ability levels. After completion of the ANOVA, Univariate Analysis of Covariance was used to test each hypothesis associated with research question. Analysis of Covariance provides control for those predictive values associated with the dependent variable. Thus, the Analysis of Covariance allowed the study to detect differences among groups while controlling for differences that may have existed in the groups due to preadmission characteristics of ACT composite score and high school GPA. Results of the hypothesis testing follow. Tables displaying ANOVA results are included. Tables displaying the adjusted means and standard deviations for adjusted means and ANCOVA results are also provided where appropriate.

**Research Question One**

Research Question One focused on differences in the cumulative grade point average earned between living-learning communities, learning communities, traditional curriculum residents, and traditional curriculum students for the duration of their academic study while considering academic year and after controlling for preadmission characteristics. The research hypothesis and null hypotheses associated with this question were:
Research Hypothesis 1: There is a statistically significant difference, on average, in cumulative grade point average among living-learning community participants, learning community participants, traditional curriculum resident students and traditional curriculum commuter students after five years of study when considering academic year and controlling for entering ability as measured by high school grade point average and ACT score.

Null Hypothesis 1a: There is no statistically significant difference, on average, in cumulative grade point average among living-learning community participants, learning community participants, traditional curriculum resident students and traditional curriculum commuter students after five years of study when considering academic year.

Null Hypothesis 1b: There is no statistically significant difference, on average, in cumulative grade point average among living-learning community participants, learning community participants, traditional curriculum resident students and traditional curriculum commuter students after five years of study when considering academic year and controlling for entering ability as measured by high school grade point average and ACT score.

**Null Hypothesis 1a.** A two-way analysis of variance (ANOVA) was conducted to assess differences of cumulative grade point average amongst curriculum types when considering academic year. A summary of the results are presented in Table 7. Levene’s test for homogeneity of variance resulted in \( p < .000 \) which was less than .05 indicating that variances are not equal amongst the population. Main effect results revealed that cumulative grade point average earned varied by curriculum type \( F(3,1599) = 28.984, \ p < .01, \ \eta^2 = .052 \). Cumulative grade point average was not statistically different for academic year of study \( F(2, 1599) = 2.930, \ p = .054, \ \eta^2 = .004 \). The interaction between academic year and curriculum type was not significant, \( F(6,1599) = 1.815, \ p = .093, \ \eta^2 = .007 \).

As equal variances could not be assumed, alternative analysis was conducted using the Tahmhané post-hoc analysis to determine which groups were significantly
different in grade point average earned. Post hoc analysis reveals statistically significant
differences among groups. Results of the post-hoc analysis are shown in Table 8. Living-
learning communities (M = 2.86, SD = .88) earned statistically significant higher grade
point averages than learning communities (M = 2.46, SD = 1.09), and traditional
curriculum commuters (M = 2.20, SD = 1.19). Learning communities (M = 2.46, SD =
1.09) earned statistically greater than traditional curriculum commuters (M = 2.20, SD =
1.19). Traditional curriculum residents (M = 2.69, SD = .88) earned greater than both
learning communities (M =2.46, SD=1.09) and traditional curriculum commuters (M =
2.20, SD = 1.19). There was not a statistically significant difference in cumulative grade
point average earned between living-learning communities and traditional residents.

Effect size is noted as a small to medium effect size accounting for 5.2% of the
variance for the model. The effect size between living-learning communities and learning
communities identified a medium effects size of .40 for the difference between groups.
The effect size between living-learning communities and traditional commuter students
was noted as large at .63. The effect noted between traditional curriculum resident
students and traditional curriculum commuter students reflects a medium to large effect
reflecting .47.

Results reveal that participants in living-learning communities had higher grade
point averages than other groups. Statistically significant differences existed for all
groups except traditional residents. Traditional residents had statistically significantly
greater grades than both learning communities and traditional commuters. Learning
communities had statistically significantly higher grades than traditional commuters. The
interaction between curriculum type and year was not statistically significant nor was grade point average between years.

Table 7
ANOVA Summary Table for Cumulative Grade Point Average

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
<th>ES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>116.93</td>
<td>11</td>
<td>10.63</td>
<td>10.27</td>
<td>.000</td>
<td>.066</td>
</tr>
<tr>
<td>Year</td>
<td>6.06</td>
<td>2</td>
<td>3.03</td>
<td>2.93</td>
<td>.054</td>
<td>.004</td>
</tr>
<tr>
<td>Curr. Type</td>
<td>89.99</td>
<td>3</td>
<td>29.99</td>
<td>28.98</td>
<td>.000</td>
<td>.052</td>
</tr>
<tr>
<td>Year x Curr. Type</td>
<td>11.27</td>
<td>6</td>
<td>1.89</td>
<td>1.82</td>
<td>.093</td>
<td>.007</td>
</tr>
<tr>
<td>Within groups</td>
<td>1654.77</td>
<td>1599</td>
<td>1.04</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>12264.41</td>
<td>1611</td>
<td>1.04</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 8
ANOVA Post Hoc Analysis for Cumulative Grade Point Average

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>M difference</th>
<th>SE</th>
<th>p</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Living-Learning community</td>
<td>2.86</td>
<td>.40</td>
<td>.070</td>
<td>.000</td>
<td>.40</td>
</tr>
<tr>
<td>• Learning community</td>
<td>2.46</td>
<td>.40</td>
<td>.070</td>
<td>.000</td>
<td>.40</td>
</tr>
<tr>
<td>• Traditional resident</td>
<td>2.69</td>
<td>.17</td>
<td>.062</td>
<td>.053</td>
<td>.19</td>
</tr>
<tr>
<td>• Traditional commuter</td>
<td>2.20</td>
<td>.66</td>
<td>.074</td>
<td>.000</td>
<td>.63</td>
</tr>
<tr>
<td>Learning community</td>
<td>2.46</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Traditional resident</td>
<td>2.69</td>
<td>-.23</td>
<td>.070</td>
<td>.005</td>
<td>.23</td>
</tr>
<tr>
<td>• Traditional commuter</td>
<td>2.20</td>
<td>.26</td>
<td>.080</td>
<td>.007</td>
<td>.23</td>
</tr>
<tr>
<td>Traditional resident</td>
<td>2.69</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Traditional commuter</td>
<td>2.20</td>
<td>.49</td>
<td>.074</td>
<td>.000</td>
<td>.47</td>
</tr>
</tbody>
</table>

**Null Hypothesis 1B.** Before the analysis of covariance (ANCOVA) can be conducted examination of the data must occur for missing cases, outliers, and fulfillment
of test assumptions. Although the tests for non-normality indicate non-normal distributions for cumulative grade point average, ANCOVA is not highly sensitive to non-normality as long as groups sizes are large and fairly equivalent (Mertler & Vanetta, 2005). Another assumption is to test the linear relationship between the covariates and dependent variables. This is only appropriate if the covariates are quantitative (Mertler & Vanetta, 2005). Scatter plots were created to determine if linear trends exists. The next assumption to be tested is homogeneity of regressing slopes to determine if a significant interaction is found between the covariates and the factors present. If a significant interaction is found, ANCOVA results are not meaningful since the interaction implies that differences on the dependent variable among groups vary as a function of the covariate. Preliminary ANCOVA can be used to evaluate this and homogeneity of variance.

For cumulative grade point average, tests for homogeneity of regression slopes were conducted to determine if a significant interaction was found between the covariates and factor is found. A preliminary ANCOVA was conducted to evaluate homogeneity of variance. For cumulative grade point average, results indicated that the interaction of curriculum type, academic year, high school grade point average, and ACT score are not significant $F(12,1591) = 1.75, p = .051$, partial eta squared =.013. Levene’s test of equal variances indicates variance between groups are not equivalent $F(11,1599) = 14.03, p < .000$.

Since interaction between the factor and covariates was not found, the full ANCOVA was conducted. Levene’s test was used to test the underlying assumption of homogeneity of variance. Results indicate this assumption was not met $F(11,1599) =$
15.17, \( p < .000 \). Results of the ANCOVA analysis are presented in Table 9. ANCOVA results indicate a significant main effect for curriculum type, \( F(3, 1597) = 15.84, p < .000 \), partial \( \eta^2 \) squared .029 and a significant main effect for year \( F(2, 1597) = 6.94, p = .001 \), partial \( \eta^2 \) squared .009. The effect size for the main effect of year is noted as small to insignificant. Interaction between curriculum type and year was not significant \( F(6, 1597) = 2.06, p = .056 \), partial \( \eta^2 \) squared .008. The covariate of high school grade point average significantly influenced the dependent variable of cumulative grade point average \( F(1,1597) = 424.39, p < .000 \), partial \( \eta^2 \) squared .210. The covariate of ACT score significantly influenced the dependent variable cumulative grade point average \( F(1, 1597) = 21.20, p < .000 \). Table 10 presents the adjusted means for academic year and Table 11 presents the adjusted means for curriculum type.

Results evaluated the null hypothesis that there is no statistically significant difference in cumulative grade point average between curriculum types when considering academic year controlling for entering ability. Results indicated that the interaction between year and curriculum type are not significant when controlling for entering ability. Analysis of covariance (ANCOVA) was used to determine whether curricular format influenced cumulative grade point average when considering academic year and controlling for entering ability measures of high school GPA and ACT score. Results indicated that there is a statistically significant difference between years in grade point average achievement. However, adjusted means show little difference between the years and the effect sizes of .09 and .04 reflect little to no difference between cumulative grade point average amongst the years.
When controlling for entering ability measures of high school GPA and ACT score, and considering academic year, adjusted means reflected significant differences among curriculum type in cumulative grade point average earned. Living-learning communities had statistically significantly higher adjusted earned grade point average (M = 2.69) over learning communities (M = 2.48) yielding a difference of .21 in cumulative grade point average earned when controlling for entering ability. Similarly, living-learning communities exceeded traditional commuters (M = 2.35) by .34 when considering entering ability. Of note, traditional curriculum resident students, after controlling for entering ability measures, had a statistically equivalent cumulative adjusted grade point average (M = 2.69) as compared to the adjusted grade point average for living-learning communities (M = 2.69). Effect size as defined by Cohen’s $d$ shows the strength of the relationship of the magnitude of the difference between the levels of the independent variable with respect to the dependent. As shown in Table 11 Learning Communities showed medium effects and traditional commuters a strong effect. When compared to living-learning communities, traditional residents showed little showed little to no effect in relation of difference.
Table 9

ANCOVA Summary Table for Cumulative Grade Point Average as a Function of Curriculum Type and Year, Using ACT Score and High School GPA as Covariates

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
<th>ES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>732.52</td>
<td>13</td>
<td>56.35</td>
<td>86.60</td>
<td>.000</td>
<td>.413</td>
</tr>
<tr>
<td>HS-GPA</td>
<td>276.16</td>
<td>1</td>
<td>276.16</td>
<td>424.39</td>
<td>.000</td>
<td>.210</td>
</tr>
<tr>
<td>ACT</td>
<td>13.79</td>
<td>1</td>
<td>13.79</td>
<td>21.20</td>
<td>.000</td>
<td>.013</td>
</tr>
<tr>
<td>Year</td>
<td>9.04</td>
<td>2</td>
<td>4.52</td>
<td>6.94</td>
<td>.001</td>
<td>.009</td>
</tr>
<tr>
<td>Curriculum Type</td>
<td>30.92</td>
<td>3</td>
<td>10.31</td>
<td>15.84</td>
<td>.000</td>
<td>.029</td>
</tr>
<tr>
<td>Year x Curr. Type</td>
<td>8.03</td>
<td>6</td>
<td>1.34</td>
<td>2.06</td>
<td>.056</td>
<td>.008</td>
</tr>
<tr>
<td>Error</td>
<td>1039.19</td>
<td>1597</td>
<td>.65</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>122264.41</td>
<td>1611</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 10

Academic Year Means for Cumulative Grade Point Average Using High School GPA and ACT Score as Covariates

<table>
<thead>
<tr>
<th>Year</th>
<th>Unadjusted</th>
<th>Adjusted</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>M</td>
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<tr>
<td>2004</td>
<td>386</td>
<td>2.57</td>
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<tr>
<td>2005</td>
<td>515</td>
<td>2.47</td>
</tr>
<tr>
<td>2006</td>
<td>710</td>
<td>2.61</td>
</tr>
</tbody>
</table>
Table 11

Curriculum Type Means for Cumulative Grade Point Average Using High School GPA and ACT Score as Covariates

<table>
<thead>
<tr>
<th>Curriculum Type</th>
<th>Unadjusted M</th>
<th>Unadjusted SD</th>
<th>Adjusted M</th>
<th>Adjusted SE</th>
<th>Adjusted M difference</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Living-Learning community</td>
<td>2.86</td>
<td>.882</td>
<td>2.69</td>
<td>.042</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Learning community</td>
<td>2.46</td>
<td>1.093</td>
<td>2.48</td>
<td>.042</td>
<td>.21</td>
<td>.40</td>
</tr>
<tr>
<td>• Traditional resident</td>
<td>2.69</td>
<td>.881</td>
<td>2.69</td>
<td>.041</td>
<td>.00</td>
<td>.19</td>
</tr>
<tr>
<td>• Traditional commuter</td>
<td>2.20</td>
<td>1.187</td>
<td>2.35</td>
<td>.042</td>
<td>.34</td>
<td>.63</td>
</tr>
<tr>
<td>Learning community</td>
<td>2.46</td>
<td>1.093</td>
<td>2.48</td>
<td>.042</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Traditional resident</td>
<td>2.69</td>
<td>.881</td>
<td>2.69</td>
<td>.041</td>
<td>-.21</td>
<td>.23</td>
</tr>
<tr>
<td>• Traditional commuter</td>
<td>2.20</td>
<td>1.187</td>
<td>2.35</td>
<td>.042</td>
<td>.14</td>
<td>.23</td>
</tr>
<tr>
<td>Traditional resident</td>
<td>2.69</td>
<td>.881</td>
<td>2.69</td>
<td>.041</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Traditional commuter</td>
<td>2.20</td>
<td>1.187</td>
<td>2.35</td>
<td>.042</td>
<td>.34</td>
<td>.47</td>
</tr>
</tbody>
</table>

**Research Question Two**

Research Question Two focused on differences in the cumulative credits earned between living-learning communities, learning communities, traditional curriculum residents, and traditional curriculum commuter students for the duration of their academic study after considering academic year of study and controlling for preadmission characteristics. The research hypothesis and null hypotheses associated with this question were:

**Research Hypothesis 2:** There is a statistically significant difference, on average, in cumulative credits earned among living-learning community participants, learning community participants, traditional curriculum resident students, and traditional curriculum commuter students after five years of study when considering academic year of study and controlling for entering ability as measured by high school grade point average and ACT score.

**Null Hypothesis 2a:** There is no statistically significant difference, on average, in cumulative credits earned among living-learning community participants, learning community participants, traditional curriculum resident students, and
Null Hypothesis 2b: There is no statistically significant difference, on average, in cumulative credits earned among living learning community participants, learning community participants, traditional curriculum resident students and traditional curriculum commuter students after five years of study when considering academic year of study and controlling for entering ability as measured by high school grade point average and ACT score.

**Null Hypothesis 2a.** A two-way analysis of variance (ANOVA) was conducted to assess differences of credits earned amongst curriculum types when considering academic year. A summary of the results are presented in Table 12. Levene’s test for homogeneity of variance resulted in $p < .000$ which was less than .05 indicating that variances are not equal amongst the population. Main effect results revealed that credits earned varied by curriculum type $F(3,1599) = 18.873$, $p < .000$, partial eta squared = .034. Credits earned was not statistically different for academic year of study $F(2,1599) = .780$, $p = .458$, partial eta squared = .001. The interaction between academic year and curriculum type was not significant, $F(6,1599) = 1.306$, $p = .251$, partial eta squared = .005.

As equal variances could not be assumed, alternative analysis was conducted using the Tamhane post-hoc analysis to determine which groups were significantly different in credits earned. Post hoc analysis revealed statistically significant differences among groups. Results of the post-hoc analysis are shown in Table 13. Living-learning communities ($M = 97.09$, $SD = 56.52$) earned statistically significant greater credits than learning communities ($M = 74.59$, $SD = 57.22$), traditional curriculum residents ($M = 83.28$, $SD = 55.62$) and traditional curriculum commuters ($M = 67.16$, $SD = 55.86$). Traditional curriculum residents ($M = 83.28$, $SD = 55.62$) earned greater credits than
traditional curriculum commuters (M = 67.16, SD = 55.86). There were not statistically significant differences in credits between other groups.

Effect size is noted as a small effect size accounting for 3.4% of the variance for the model. The effect size between living-learning communities and learning communities identified a medium effects size of .40 for the difference between groups. The effect size between living-learning communities and traditional residents was small to medium at .25. The effect size for living-learning communities compared to traditional commuter students was noted as large at .53. The effect noted between traditional curriculum resident students and traditional curriculum commuter students reflected a small to medium effect reflecting .29. The effect sizes between learning communities and both traditional residents and traditional commuters were small at .15 and .13 respectively.

Results reveal that participants in living-learning communities had higher credits earned than all other groups. Statistically significant differences existed for all groups. Differences between living-learning communities were 22.5 credits for learning communities, 13.81 credits for traditional residents, and 29.93 credits for commuters on average. Traditional residents exceeded traditional commuters by 16.12 credits on average. Differences reflect the equivalent of one semester for traditional residents and the equivalent of an academic year for both learning community and traditional commuters. Traditional residents had statistically significant greater credits, on average, than traditional commuters. The interaction between curriculum type and year was not statistically significant nor was grade point average between years.
Table 12
ANOVA Summary Table for Credits Earned

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
<th>ES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>229241.30</td>
<td>11</td>
<td>20840.12</td>
<td>6.58</td>
<td>.000</td>
<td>.043</td>
</tr>
<tr>
<td>Year</td>
<td>4943.39</td>
<td>2</td>
<td>2471.70</td>
<td>.78</td>
<td>.458</td>
<td>.001</td>
</tr>
<tr>
<td>Curr. Type</td>
<td>179354.13</td>
<td>3</td>
<td>59784.71</td>
<td>18.87</td>
<td>.000</td>
<td>.034</td>
</tr>
<tr>
<td>Year x Curr. Type</td>
<td>24826.28</td>
<td>6</td>
<td>4137.71</td>
<td>1.31</td>
<td>.251</td>
<td>.005</td>
</tr>
<tr>
<td>Within groups</td>
<td>5065184.45</td>
<td>1599</td>
<td>3167.72</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1.573E7</td>
<td>1611</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 13
ANOVA Post Hoc Analysis for Credits Earned

<table>
<thead>
<tr>
<th>M</th>
<th>M difference</th>
<th>SE</th>
<th>p</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Living-Learning community</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>• Learning community</td>
<td>74.59</td>
<td>22.50</td>
<td>.000</td>
<td>.40</td>
</tr>
<tr>
<td>• Traditional resident</td>
<td>83.28</td>
<td>13.81</td>
<td>.003</td>
<td>.25</td>
</tr>
<tr>
<td>• Traditional commuter</td>
<td>67.16</td>
<td>29.93</td>
<td>.000</td>
<td>.53</td>
</tr>
<tr>
<td>Learning community</td>
<td>74.59</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Traditional resident</td>
<td>83.28</td>
<td>-8.70</td>
<td>.162</td>
<td>.15</td>
</tr>
<tr>
<td>• Traditional commuter</td>
<td>67.16</td>
<td>7.43</td>
<td>.321</td>
<td>.13</td>
</tr>
<tr>
<td>Traditional resident</td>
<td>83.28</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Traditional commuter</td>
<td>67.16</td>
<td>16.12</td>
<td>.000</td>
<td>.29</td>
</tr>
</tbody>
</table>

Null Hypothesis 2b. To assess the impact of entering ability on group differences was attempted to be assessed by the two-way analysis of covariance procedures. Before the analysis of covariance (ANCOVA) can be conducted, examination of the data must occur for missing cases, outliers, and fulfillment of test assumptions. Tests for normality found relatively normal distributions for credits earned although ANCOVA is not highly
sensitive to non-normality as long as groups sizes are large and fairly equivalent (Mertler & Vanetta, 2005). Another assumption is to test the linear relationship between the covariates and dependent variables. This is only appropriate if the covariates are quantitative (Mertler & Vanetta, 2005). Scatter plots were created to determine if linear trends exists. The next assumption to be tested is homogeneity of regressing slopes to determine if a significant interaction is found between the covariates and the factors present. If a significant interaction is found, ANCOVA results are not meaningful since the interaction implies that differences on the dependent variable among groups vary as a function of the covariate. Preliminary ANCOVA can be used to evaluate this and homogeneity of variance.

A preliminary ANCOVA was conducted to evaluate these assumptions. For credits earned, results indicated that the interaction of curriculum type, year, high school grade point average and ACT score were not significant $F(12,1591) = .619, p = .828$, partial eta squared = .005. Since interaction between the factors and the covariates was not found, fulfilling the required assumptions, the full ANCOVA was conducted. Levene’s test in the underlying assumption of homogeneity of variance for the two-way ANCOVA was not met $F(11,1599) = 3.010, p = .001$. Equal variances were not assumed.

Results of the ANCOVA analysis are presented in Table 14. ANCOVA results indicate a significant main effect for curriculum type, $F(3, 1597) = 6.76, p < .000$, partial eta squared .013. There was not a significant main effect for year $F(2, 1597) = 2.91, p = .055$, partial eta squared .004. Interaction between curriculum type and year was not significant $F(6, 1597) = 91, p = .483$, partial eta squared .003. Table 15 presents the adjusted means for credits earned by curriculum type. The relationship for covariates
were found to be significant for high school grade point average \( F(1,1597) = 230.99, p < .000, \) partial eta squared .126, and for ACT score \( F(1,1597) = 3.96, p < .000, \) partial eta squared = .027. This indicates that a relationship exists between the covariates and dependent variable cumulative credits earned.

Table 14

ANCOVA Summary Table for Credits Earned as a Function of Curriculum Type and Year, Using ACT Score and High School GPA as Covariates

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
<th>ES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>1.731E6</td>
<td>13</td>
<td>133180.79</td>
<td>59.69</td>
<td>.000</td>
<td>.327</td>
</tr>
<tr>
<td>HS-GPA</td>
<td>515357.94</td>
<td>1</td>
<td>515357.94</td>
<td>230.99</td>
<td>.000</td>
<td>.126</td>
</tr>
<tr>
<td>ACT</td>
<td>98083.40</td>
<td>1</td>
<td>98083.40</td>
<td>43.96</td>
<td>.000</td>
<td>.027</td>
</tr>
<tr>
<td>Year</td>
<td>12966.14</td>
<td>2</td>
<td>6483.07</td>
<td>2.91</td>
<td>.055</td>
<td>.004</td>
</tr>
<tr>
<td>Curriculum Type</td>
<td>45233.25</td>
<td>3</td>
<td>15077.75</td>
<td>6.76</td>
<td>.000</td>
<td>.013</td>
</tr>
<tr>
<td>Year x Curr. Type</td>
<td>122241.07</td>
<td>6</td>
<td>2040.18</td>
<td>.91</td>
<td>.483</td>
<td>.003</td>
</tr>
<tr>
<td>Error</td>
<td>3563075.43</td>
<td>1597</td>
<td>2231.11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1.573E7</td>
<td>1611</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
Table 15

Curriculum Type Means for Credits Earned Using High School GPA and ACT Score as Covariates

<table>
<thead>
<tr>
<th></th>
<th>Unadjusted M</th>
<th>SD</th>
<th>Adjusted M</th>
<th>SE</th>
<th>Adjusted M difference</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Living-Learning community</td>
<td>97.01</td>
<td>56.52</td>
<td>89.44</td>
<td>2.45</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Learning community</td>
<td>74.59</td>
<td>57.22</td>
<td>76.87</td>
<td>2.43</td>
<td>12.57</td>
<td>.40</td>
</tr>
<tr>
<td>• Traditional resident</td>
<td>83.28</td>
<td>55.62</td>
<td>83.11</td>
<td>2.43</td>
<td>6.33</td>
<td>.25</td>
</tr>
<tr>
<td>• Traditional commuter</td>
<td>67.16</td>
<td>55.86</td>
<td>75.48</td>
<td>2.44</td>
<td>13.96</td>
<td>.53</td>
</tr>
<tr>
<td>Learning community</td>
<td>74.59</td>
<td>57.22</td>
<td>76.87</td>
<td>2.43</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Traditional resident</td>
<td>83.28</td>
<td>55.62</td>
<td>83.11</td>
<td>2.43</td>
<td>-6.24</td>
<td>.15</td>
</tr>
<tr>
<td>• Traditional commuter</td>
<td>67.16</td>
<td>55.86</td>
<td>75.48</td>
<td>2.44</td>
<td>1.39</td>
<td>.13</td>
</tr>
<tr>
<td>Traditional resident</td>
<td>83.28</td>
<td>55.62</td>
<td>83.11</td>
<td>2.43</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Traditional commuter</td>
<td>67.16</td>
<td>55.86</td>
<td>75.48</td>
<td>2.44</td>
<td>7.63</td>
<td>.29</td>
</tr>
</tbody>
</table>

Results evaluated the null hypothesis that there is not statistically significant difference in credits earned by curriculum type when considering controlling for entering ability. Analysis of covariance (ANCOVA) was used to determine whether curricular format influenced cumulative credits earned when considering academic year and controlling for entering ability measures of high school GPA and ACT score. Results indicate that there is a statistically significant difference between groups after controlling for entering ability. Living-learning communities significantly completed greater credits than all other groups. The interaction between year and curriculum type was not significant for credits earned. There is no significant difference among of credits earned across the three years of the study. The achievement pattern did not differ by year, and curriculum type was the only significant factor when controlling for entering ability.
When controlling for entering ability measures of high school GPA and ACT score, adjusted means reflect significant differences among curriculum type in cumulative credits earned. Living-learning communities had statistically significantly higher adjusted earned credits earned over all other curriculum types. Living-learning communities (M = 89.44) earned greater credits over learning communities (M = 76.87) yielding a difference of 12.57 in credits earned on average when controlling for entering ability. Living-learning communities exceeded traditional residents (M = 83.11) by 6.33 credits on average. Most notably, living-learning communities exceeded traditional commuters (M = 75.48) by 13.96 credits on average when considering entering ability. Effect size as defined by Cohen’s d shows the strength of the relationship of the magnitude of the difference between the levels of the independent variable with respect to the dependent. As shown in Table 15 traditional commuters showed strong effect size (.53), learning communities (.40) medium effects and traditional residents indicated (.25) small to medium effect size.

Summary of Results

This study sought to determine if participation in the living-learning communities at a large, Midwestern, urban institution in 2004, 2005, and 2006 had an impact on performance and retention through the course college career by yielding differences in academic performance and persistence measures. This study also sought to broadly determine, when considering academic year controlling for entering ability, whether there is a statistically significant difference, on average, in the fifth year of academic performance and retention rates of living-learning community participants, learning
community participants, traditional curriculum resident students, and traditional commuter students.

In this chapter, the data for this study were presented and analyzed in the context of the two research questions. When considering academic performance as measured by cumulative grade point average, two-way analysis of variance (ANOVA) was used to identify statistically significant differences between groups. Utilization of year as an independent variable in addition to curriculum type allowed for consideration of differences amongst the years. Analysis of covariance (ANCOVA) allowed for controlling pre-admission characteristics of high school GPA and ACT score indicating differences in cumulative grade point average on average between groups. ANOVA results indicated statistically significant different cumulative grade point averages between groups. Likewise, ANCOVA results indicated statistically significant differences between groups when controlling for entering ability variables.

When considering persistence as measured by cumulative credits earned, two-way analysis of variance (ANOVA) was used to identify statistically significant differences between groups. Utilization of year as an independent variable in addition to curriculum type allowed for consideration of differences amongst the years. Analysis of covariance (ANCOVA) was conducted to assess these differences when controlling for entering ability measures of high school GPA. For 2004, 2005, and 2006 ANOVA results indicated differences in cumulative credits earned between curriculum types. ANCOVA results indicated statistically significant differences between groups when controlling for entering ability variables.
Taken together, results indicated that the interaction between year and curriculum were not significant for both grade point average and credits earned. There were not significant differences among the students’ grade point averages and credits earned across the three years. Curriculum type served as the only significant factor in the study. The achievement pattern was consistent for living-learning communities surpassing others in each cohort for both credits earned and cumulative grade point average.
CHAPTER V
SUMMARY, DISCUSSION, AND RECOMMENDATIONS

Introduction

This study served to examine the impact of participation in a living-learning community on measures of academic success. Extensive research exists on the positive outcomes associated with participation in living-learning communities after the first year of study; however, few examine the impact on such factors throughout the duration of the academic career. This study sought to determine if academic success measures of academic performance and persistence after participation in these communities provides a lasting impact on student success.

This chapter first provides a summary of the theory and research driving support of living-learning communities and the basis for the study. The chapter then provides the framework and results of the study. It follows with discussion of these findings.

Summary

In response to public demands for accountability, institutions have begun a holistic evaluation of the university experience and its contribution to student success. In this process, focus has been shifted from teaching-centered environments to learning-centered education. This learning-centered environment focuses on opportunities and experiences that encourage active engagement, enhance learning, and support student
success (Bobilya & Akey, 2002). Accountability measures focus on measurable outcomes, most notably progress toward graduation and grade point average.

The works of Astin and Tinto provide a theoretical framework related to retention and student success based upon the undergraduate experience. Astin (1984) concluded that factors contributing to persistence were linked directly to involvement, whereas departure was associated with noninvolvement. In addition to involvement, Astin (1997) indicated that four variables accounted for the bulk of variance in retention. These included high school grades, admissions test scores, gender, and race of the student. According to Tinto (1987), high levels of integration into the academic life of an institution led to greater commitment to the institution. Tinto (1993) emphasized integration into the learning experience between social and the academic – the interaction must yield substance to the student in which relationships are drawn between academic content and social experience such that students draw connections between them. He suggested that increases in student integration results in greater student commitment to personal goals, the institution, and ultimately yielding retention and academic success (Tinto, 1993).

In looking to assess student success broadly, persistence and academic performance, as measured by cumulative grade point average and credits earned, have been utilized as the primary point of analysis by a number of studies. In addition, student background characteristics and levels of engagement were found to be significantly related to their grades in college, and it was found that grades are an indicator as whether students will persist and graduate (Pike et al., 2008). As such, a relationship has been suggested between background characteristics and student performance.
Astin (1991, 1993) presents a model to evaluate the impact of environmental experiences on students. The Input-Environment-Outcome (I-E-O) model serves as a guide in assessing those variables, changes or growth after exposure to an environment. The core of the model draws from pairing outcome characteristics with input characteristics after experiencing a specific environment. The I-E-O model defines three essential components of educational assessment. Inputs identify student characteristics typically in skillsets at entry to college. Environment is the intervention or student experience on campus. Outcomes are the skills or ability or experiences educators seek to reach through the environment or campus experience. The model allows educators to correct or control for input differences when assessing intervention outcomes.

Tinto’s theories of student departure and Astin’s idea of involvement point to the need for the integration of students’ social and academic lives to improve academic success and retention and suggest the power of learning communities to support student persistence. One mechanism to support these environments has evolved in the learning community (Talburt & Boyles, 2005). Learning communities are characterized by a variety of approaches that link or cluster classes around a theme and a cohort of students during a given term. This represents an intentional restructuring of time and experience for students, by linking classroom content with activities and social engagement (Bobilya & Akey, 2002). Through encouragement of integration and engagement, learning communities should promote and enhance the university experience for the student (Lenning & Ebbers, 1999; Stassen, 2003). Although the curricular and co-curricular content may vary in learning communities, each has shared knowledge, knowing, and peer responsibility in the building and collaboration of learning (Tinto, 1999). Criteria
with learning community successes are typically based upon data that reflect measurable
variables, such as retention in college, academic program, or grade point average (Schein, 2005).

There has been a significant body of research regarding outcomes associated with
communities (Stassen, 2003). Stassen (2003), after evaluation of the extensive body of
research regarding learning communities noted that, “Even in the least coordinated, most
basic learning community model, students show more positive outcomes (first semester
GPA, retention, first-year experience) than non-learning community students” (p. 581).

The work of Chickering (1975), Astin (1977), and Pascarella and Terenzini (1991)
have laid the foundation that residence halls make a contribution to student education.
According to Chickering (1975), living on campus as opposed to commuting from home
has a positive effect on students as a result of the types of relationships students form
with others in the residence halls. He suggested that students are more likely to break
from traditional groups in such environments and willingness to engage others openly is
significant.

It has long been cited that abundant evidence exists that living on campus has
strong positive effect on student persistence (Berger, 1997). Residence halls provide the
opportunities for involvement, engagement, and promote the commitment suggested as
critical by Tinto and Astin. Compared to students who live off campus, resident students
have significantly higher levels of faculty and student interaction, peer support, greater
opportunities for interaction and significantly greater satisfaction and commitment. The
interaction and inclusion effects of the residence halls, coupled with the fact that
residence has students come better prepared to succeed, help explain why resident
students are significantly more likely to persist than those living off campus (Pike, 2002; Pike et al., 1997).

Tinto’s (1993) emphasis on the interaction between the individual students and various campus communities suggest that residence hall experiences provide frameworks to enhance persistence. Research on residential status and academic and social integration, as tied to Tinto’s work, indicates that resident students tend to participate in on-campus activities at higher levels than non-residents, and therefore levels of such involvement may influence student engagement, commitment, and persistence (Pascarella & Inman, 1998). McCluskey-Titus and Oliver (2001) mirrored Tinto’s and Astin’s position when they reported that the data suggest that students who live in residence halls feel a sense of belonging; have people interested in their intellectual development; have well developed relationships with peers on their floor; and achieve higher grades. Students with a strong sense of community in campus environments like residence halls are more likely to be fully connected or more integrated in to the campus (Berger, 1997; McCluskey-Titus & Oliver, 2001). Berger’s (1997) study confirmed that the strong connection between peer relations and community emphasized the connection with the residence halls and the development of the student’s involvement on campus. The study concluded that the residential communities serve as a successful bridge between the student and the overall normative environment on campus providing a framework for their engagement with faculty and their satisfaction with the institution. This is the same type of engagement Tinto and Astin suggest as supportive of persistence and academic success.
Following the constructs developed by Tinto and Astin and noting the impact of the suggested student social and academic integration which promotes engagement to yield positive outcomes, the primary indicators of academic performance and student persistence posit a recognition of the opportunity for merging the successes of living on-campus and learning communities. Intentional living-learning communities expand upon the traditional models of Cambridge and Oxford residential living and appear to be higher education’s attempt to respond to the student and societal need for quality education (Pasque & Murphy, 2005). The critical difference between living-learning programs and other learning communities is that the participants not only partake in coordinated curricular activities but also live together in a specific residence hall where they are provided academic programming and services. They were created as a means of integrating experiences by providing a community that fosters greater faculty and peer interaction in an academically and socially supported environment (Inkelas & Weisman, 2003). It has been suggested, as well, that traditional residential environments may position social engagement against academic focus, where the living-learning community merges the two environments (Stassen, 2003).

Living-learning communities have been associated with gains in critical thinking, cognitive development, strong peer interactions, and more frequent interactions with faculty than traditional residential environments (Garrett & Zabriski, 2003; Kuh et al., 1994; Pike et al., 1997). In holistic view, participation in living-learning programs provides a broad impact upon involvement and engagement, and many yield significant outcomes with regard to academic performance and persistence. However, two common concerns arise from these findings. A commonly noted criticism in research on outcomes
associated with participation in living-learning communities notes that positive student outcomes among this population may be less related to the program impact and more related to the innate abilities and preferences of the students who elected to participate in them (Inkelas & Weisman, 2003). Participants who choose to enroll in such programs may demonstrate greater levels of motivation to seek success and, to this end, may skew results.

Of particular note, the vast majority of studies focus outcome measures on the first year successes of the programs. Specifically, primary consideration is given to first term or first year persistence and academic performance measures. Few studies consider the long-term impact of participation in living-learning programs through graduation. Few assess the impact of participation on persistence to graduation and overall undergraduate academic performance. The lens of focus has been primarily on the first year of study, and while significant, little exploration has occurred beyond the first year. Only recently a few studies have begun to emerge. For example, in a study of the SUNY College of Environmental Science and Forestry learning community, White and Tuberville (2005) not only studied first year outcomes of participants in its living-learning program finding significant gains in academic performance and persistence, but also reviewed five years later the long-term success of the first cohort. They found that participants graduated at a 10% higher rate than non-participants and earned higher grade point averages than non-participants. Conducting similar studies may yield greater insight into the impact of such programs on overall success.

The theories provided by Tinto (1999) and Astin (1993) identify that involvement within the campus environment and engagement with peers and faculty support
persistence and academic performance. Entering ability as measured by high school grade point average and entry exam score (i.e., ACT) have been found to be predictive values of measures of academic performance and persistence. Findings suggest as well that residence hall environments provide a supportive environment to promote interactions which enhance student sense of belonging and involvement, particularly in the first year of study. Learning communities partner the co-curricular experience within the academic context and promote deeper learning of academic content while engaging students and their peers in learning processes. Living-learning communities merge these learning community experiences within the residential environments. Research suggests that the evolution of living-learning communities requires on-going research to assess their impact on desired outcomes and respond to public calls for accountability.

Summary of the Study

In the fall of 2004, a large Midwestern urban university piloted six living-learning communities targeting first year students with the intention of improving retention and academic performance of participants. These programs continued offering these programs for the entering classes of 2005 and 2006. The problem of this study was to determine the effectiveness of the living-learning communities program in achieving its goals of persistence and academic performance throughout the duration of academic career by examining the variables of student success as measured by cumulative grade point average and cumulative credits earned after five years of exposure to the programs and compared to students who participated in learning communities that were not residentially based, traditionally enrolled resident student and traditionally enrolled
commuter students. This study aimed to provide useful feedback to the administrators of the program regarding the long-term impact in participation in such programs beyond the first year of study. In addition, the inclusion of high school GPA and ACT score as covariates in this study adds depth to the analysis by considering impact that considers predictive indicators of student success. Such information may be an effective tool for securing and maintaining funding and support for the expansion of the programs and provide a rich basis to practitioners at other institutions.

The review of the literature suggested that living-learning communities can be of tremendous value in shaping the student experience. In Chapter II, examples were provided in which researchers found living-learning community participation to be associated with increased student involvement, increased academic success as measured by grade point average, and increased persistence as measured in cumulative credits earned. While the review of the literature provided support for living-learning communities, the emphases on quality, efficiency, and accountability in higher education demand that additional assessment of learning retention and performance-based programs are done. Further assessment data demonstrating the outcomes of such programs are essential in their continuance. Moreover, since living-learning community programs often start as pilot programs serving a small number of students, assessment data can demand that such programs be expanded to serve larger numbers of students. To this end, this study focuses on the results of the pilot year and two successive years of living-learning communities at this institution and considers year of participation in the analysis.

Whereas a number of studies provide information about student success, since most learning programs focus entirely on the first term and the first year, few studies
examine outcomes of participation beyond the first year of student. This study was necessary to identify if programs truly met objectives by examining outcomes beyond the first year of study to achieve true outcomes, enhancing academic performance, and supporting persistence throughout the academic career. This study complements the previous research in that it reports two indicators of academic success in one study: cumulative grade point average at the end of the course of study and progress toward degree completion as indicated in the number of credits earned through the course of study.

The population under study was students at a large, Midwestern, urban public university who entered the institution as first-time students, full-time students enrolled in four-year programs beginning their course of study in fall 2004, 2005, and 2006. This study included only those students enrolled as first-time, full-time students enrolled in four-year degree programs. Data regarding pre-admission characteristics of high school GPA and ACT score, cumulative grade point average, and cumulative credits earned were provided by institutional research.

The independent variables for the study were curriculum type as defined by participation in a living-learning community, learning community, traditional resident enrollment, or traditional commuter involvement, and academic year as identified by students admitted term of 2004, 2005, or 2006. The dependent variables for the study were centered on academic success measures of cumulative grade point average and cumulative credits earned collected five years after the beginning of study. High school GPA and ACT score were utilized as covariates because of the predictive nature of these variables as related to academic persistence to degree completion.
Two research questions were developed to address the problem of this study. Research Question One focused on differences in cumulative grade point average earned based upon participation in living-learning communities after five years of study. One null hypothesis was tested for this research question utilizing cumulative grade point average earned between curriculum types and academic year. The second null hypothesis utilized the same inputs and controlled for entering ability through preadmission characteristics to identify differences between the groups.

Research Question Two focused on differences in cumulative credits earned based upon participation in living-learning communities after five years of study. One null hypothesis was tested for this research question utilizing cumulative grade point average earned between curriculum types and academic year. The second null hypothesis utilized the same inputs and controlled for entering ability through preadmission characteristics to identify differences between the groups.

Each hypothesis was tested using Analysis of Variance to compare means and identify differences between groups. Analysis of Covariance was used to compare means while employing statistical methods to control for academic differences that might have been present in the students as indicated by ACT score hand high school grade point average. The .05 level of significance was used. Demographic information was reported and examined.

**Summary of the Data Analysis**

The data for this study were presented and analyzed in Chapter IV. Descriptive statistics, including information regarding high school GPA, ACT score, cumulative
grade point average, and cumulative credits earned were provided. Means and standard errors for each dependent variable and the results of ANOVA and ANCOVA testing were displayed in the various tables.

**Findings for Research Question One**

Does cumulative grade point average differ among living-learning community participants, learning community participants, traditional curriculum resident students and traditional curriculum commuter students after five years of study when considering academic year and controlling for high school grade point average and ACT score? The first null hypothesis addressing this research question assessed the differences in grade point average earned after five years between living-learning communities, learning communities, traditional curriculum residents, and traditional curriculum commuter students and their academic year of study.

**Null Hypothesis 1a.** Upon examination of the descriptive statistics, students participating in living-learning communities appeared to have higher earned cumulative grade point averages, $M = 2.86$ than learning community participants, $M = 2.46$, traditional curriculum resident students, $M = 2.69$, and traditional curriculum commuter students, $M = 2.20$.

The main effect results of the Analysis of Variance (ANOVA) test indicated statistically significant differences between the curriculum type groups $F(3,1599) = 28.984, p < .01$, partial eta squared $= .052$. The effect size for the model as measured by partial eta squared notes a medium effect size accounting for 5.2% of variance. Cumulative grade point average was not statistically different for the academic year of
study, F(2, 1599) = 2.930, \( p = .054 \), partial eta squared .004. The interaction between academic year and curriculum type was not significant, F(6, 1599) = 1.815, \( p = .093 \), partial eta squared = .007.

Post-hoc analysis was conducted to assess differences between groups. Living-learning communities earned statistically significant different mean grade point average \((M = 2.86, SD = .88)\) than learning community participants \((M = 2.46, SD = 1.09, p < .01, d = .40)\) with a mean difference of .40. Living-learning communities also earned statistically significant greater grade point averages than traditional curriculum commuter students \((M = 2.20, SD = 1.19, p < .01, d = .63)\) with a mean difference of .66. Learning communities \((M = 2.46, SD = 1.09)\) earned statistically greater than traditional curriculum commuters \((M = 2.20, SD = 1.19, p = .007, d = .23)\) with a mean difference of .26. Traditional resident students earned statistically significantly greater grade point average \((M = 2.69, SD = .88)\) than learning community participants \((M = 2.46, SD = 1.09, p = .005, d = .23)\) with a mean difference of .23 and commuter students \((M = 2.20, SD = 1.19, p < .001, d = .47)\) with an average mean difference of .49. The Cohen’s \( d \) evaluates the effect size and represents medium to strong effect sizes for the magnitude of the results. There was no statistically significant difference between living-learning communities and traditional curriculum residents.

For all curriculum types except traditional curriculum residents, living-learning community participants earned statistically significantly higher grade point averages with mean differences earned yielding large differences of between .40 and .66 for learning communities and traditional curriculum commuters, respectively. Interestingly, significant differences were found between traditional curriculum resident and traditional
curriculum commuters with mean difference of .49 in grade point average earned. Holistically, differences among curriculum types suggest the impact these programs may have over the course of academic study. The interaction between year and curriculum type was not significant for grade point average indicating there was not a significant difference across the three years, indicating a consistent achievement pattern for the groups and the curriculum type serving as delineating factor.

**Null Hypothesis 1b.** The second null hypothesis addressing this research question assessed the differences in grade point average earned after five years between living-learning communities, learning communities, traditional curriculum residents, and traditional curriculum commuter students when considering academic year and controlling for entering ability as measured by high school GPA and ACT score. Analysis of covariance (ANCOVA) was utilized to assess differences while controlling for entering ability.

The ANCOVA analysis indicated that the homogeneity of variance assumption was not met as expected by the nature of the distribution of the data. ANCOVA results indicated a significant main effect for curriculum type, $F(3,1597) = 15.84, p < .009$, partial eta squared .029 and a significant main effect for year $F(2,1597) = 6.94, p = .001$, partial eta squared .009. The effect size for the main effect of year is noted as small to insignificant. Interaction between year and curriculum type was not significant $F(6,1597) = 2.06, p = .056$, partial eta squared .008. The covariate of high school grade point average significantly influenced the dependent variable of cumulative grade point average $F(1, 1597) = 424.39, p < .000$, partial eta squared .210. The covariate of ACT score significantly influenced the dependent variable cumulative grade point average $F(1,
1597) = 21.20, \( p < .000 \), partial eta squared .013. Results indicated statistically significant differences in means between groups when controlling for entering ability and that the interaction between year and curriculum type are not significant when controlling for entering ability. When controlling for entering ability, results indicated that there is a statistically significant difference between years in grade point average achievement. However, adjusted means show little difference between the years and the effect sizes of .09 and .04 reflect little to no difference between cumulative grade point average amongst the years.

When controlling for entering ability measures of high school GPA and ACT score and considering academic year, adjusted means reflected significant differences among curriculum type in cumulative grade point average earned. Living-learning communities had statistically significantly higher adjusted earned grade point average (\( M = 2.69 \)) over learning communities (\( M = 2.48 \)) yielding a difference of .21 in cumulative grade point average earned when controlling for entering ability. Similarly, living-learning communities exceeded traditional commuters (\( M = 2.35 \)) by .34 when considering entering ability. Of note, traditional curriculum resident students, after controlling for entering ability measures, had a statistically equivalent cumulative adjusted grade point average (\( M = 2.69 \)) as compared to the adjusted grade point average for living-learning communities (\( M = 2.69 \)). The difference between living-learning communities and learning communities showed medium effects (\( d = .40 \)) and traditional commuters showed a strong effect (\( d = .60 \)). When compared to living-learning communities, traditional residents showed little to no effect in relation of difference.
Taken together, these findings suggest that curriculum type and specifically living-learning programs have been associated with outcomes that carry through academic career as evidenced in grade point average. These outcomes were significantly greater than learning communities that did not contain the residential or living component. Distinct and significant differences were pronounced between living-learning communities and commuter students when controlling for entering ability. Likewise, the findings that traditional residents’ adjusted grade point averages significantly exceeded other curriculum types support the research suggesting the strong impact of campus living on students. Evaluation by both curriculum type and academic year showed that interaction between year and curriculum type was not significant, that the achievement pattern did not differ by year. When controlling for entering ability measures, living-learning communities significantly exceeded all curriculum types where curriculum type served as the primary significant factor.

**Findings for Research Question Two**

Do cumulative credits earned differ among living-learning community participants, learning community participants, traditional curriculum resident students and traditional curriculum commuter students after five years of study when considering academic year and controlling for high school grade point average and ACT score? The first null hypothesis addressing this research question assessed the differences in cumulative credits earned after five years between living-learning communities, learning communities, traditional curriculum residents, and traditional curriculum commuter students when considering academic year.
**Null Hypothesis 2a.** Upon examination of the descriptive statistics, students participating in living-learning communities appeared to have higher earned cumulative credits, $M = 97.09$ than learning community participants, $M = 74.59$, traditional curriculum resident students, $M = 83.28$, and traditional curriculum commuter students, $M = 67.16$.

A two-way analysis of variance (ANOVA) was conducted to assess differences of credits earned amongst curriculum types when controlling for entering ability. Main effect results of the test indicated statistically significant differences between credits earned between the curriculum type groups $F(3,1599) = 18.873$, $p < .051$, partial eta squared = .034. Credits earned was not statistically significant for the academic year of study $F(2, 1599) = .780$, $p = .458$, partial eta squared = .001. The interaction between academic year and curriculum type was not significant, $F(6,1599) = 1.306$, $p = .251$, partial eta squared = .005.

Post-hoc analysis was conducted to assess differences between groups. Living-learning communities earned statistically significant different mean cumulative credits earned ($M = 97.09$, $SD = 56.52$) than learning community participants ($M = 74.59$, $SD = 57.22$, $p < .01$, $d = .40$) with an average mean difference of 22.50 credits earned. They earned significantly greater credits than traditional residents ($M = 83.28$, $SD = 55.62$, $p = .003$, $d = .25$) with an average mean difference of 13.81 credits earned and traditional commuters ($M = 67.16$, $SD = 55.86$, $p < .001$, $d = .53$) with an average mean difference of 29.93 credits earned. In addition, traditional curriculum residents ($M = 83.28$, $SD = 55.62$) earned statistically significantly greater than traditional curriculum commuters with an average mean difference of 13.81 credits earned and traditional commuters ($M =$
67.16, \( SD = 55.86, p < .001, d = .29 \) with an average mean difference of 16.12 credits earned. The Cohen’s \( d \) evaluates the effect size and represents medium to strong effect sizes for the magnitude of the results. There were no other statistically significant differences noted between other groups during post hoc analysis for cumulative credits earned.

Results reveal that participants in living-learning communities had higher credits earned than all other groups. Statistically significant differences existed for all groups. Differences between living-learning communities were 22.5 credits for learning communities, 13.81 credits for traditional residents and 29.93 credits for commuters on average. Traditional residents exceeded traditional commuters by 16.12 credits on average. Differences for living-learning communities reflect the equivalent of one semester for traditional residents and the equivalent of an academic year for both learning community and traditional commuters. Traditional residents had statistically significantly credits, on average, than traditional commuters. The interaction between curriculum type and year was not statistically significant nor was grade point average between years.

This analysis suggests that when comparing the effects associated with living-learning communities to learning communities without the residential component and commuter students, participants significantly earned greater credits to the equivalent of an academic year of study. This finding supports the assertions that the enhanced component of living environments supports greater gains. Similarly, for each year, traditional residents significantly exceeded commuter students for the greater than one semester, supporting assertions that living on campus positively impacts persistence.
Null Hypothesis 2b. The second null hypothesis addressing this research question assessed the differences in grade point average earned after five years between living-learning communities, learning communities, traditional curriculum residents, and traditional curriculum commuter students when considering academic year controlling for entering ability as measured by high school GPA and ACT score. Analysis of covariance (ANCOVA) was utilized to assess differences while controlling for entering ability.

A two-way analysis of covariance was conducted to assess differences in credits earned while considering academic year and controlling for entering ability measures of high school grade point average. ANCOVA results indicated a significant main effect for curriculum type, F(3, 1597) = 6.76, \( p < .000 \), partial eta squared .013. There was not a significant main effect for year F(2, 1597) = 2.91, \( p = .055 \), partial eta squared .004. Interaction between curriculum type and year was not significant F(6, 1597) = 91, \( p = .483 \), partial eta squared .003. The relationship for covariates were found to be significant for high school grade point average F(1,1597) = 230.99, \( p < .000 \), partial eta squared .126, and for ACT score F(1,71597) = 43.96, \( p < .000 \), partial eta squared = .027. This indicates that a relationship exists between the covariates and dependent variable cumulative credits earned. There was not a significant difference among the students in credits earned across the years and that the achievement pattern does not differ by year. Curriculum type was the only significant factor emerging from the analysis.

Results evaluated the null hypothesis that there is not statistically significant difference in credits earned by curriculum type when considering controlling for entering ability. Analysis of covariance (ANCOVA) was used to determine whether curricular format influenced cumulative credits earned when considering academic year and
controlling for entering ability measures of high school GPA and ACT score. Results indicate that there is a statistically significant difference between groups after controlling for entering ability. Living-learning communities significantly completed greater credits than all other groups. The interaction between year and curriculum type was not significant for credits earned. There is no significant difference among of credits earned across the three years of the study. The achievement pattern did not differ by year, and curriculum type was the only significant factor when controlling for entering ability.

When controlling for entering ability measures of high school GPA and ACT score, adjusted means reflect significant differences among curriculum type in cumulative credits earned. Living-learning communities had statistically significantly higher adjusted earned credits earned over all other curriculum types. Living-learning communities ($M = 89.44$) earned greater credits over learning communities ($M = 76.87$) yielding a difference of 12.57 in credits earned on average when controlling for entering ability. Living-learning communities exceeded traditional residents ($M = 83.11$) by 6.33 credits on average. Living-learning communities exceeded traditional commuters ($M = 75.48$) by 13.96 credits on average when considering entering ability. Living-learning communities exceeded all groups and most notably learning communities and traditional commuters by the equivalent of one semester of study. Effect size as defined by Cohen’s $d$ shows the strength of the relationship of the magnitude of the difference between the levels of the independent variable with respect to the dependent. Traditional commuters showed strong effect size (.53), learning communities (.40) medium effects and traditional residents indicated (.25) small to medium effect size.
Summary of the Results

This study sought to determine if participation in the living-learning communities at a large, Midwestern, urban institution in 2004, 2005, and 2006 had an impact on performance and retention through the course college career by yielding differences in academic performance and persistence measures. This study also sought to broadly determine, when considering academic year and controlling for entering ability, whether there is a statistically significant difference, on average, in the fifth year of academic performance and retention rates of living-learning community participants, learning community participants, traditional curriculum resident students, and traditional commuter students.

The data for this study were presented and analyzed in the context of the two research questions. When considering academic performance as measured by cumulative grade point average, two-way analysis of variance (ANOVA) was used to identify statistically significant differences between groups. Utilization of year as an independent variable in addition to curriculum type allowed for consideration of differences amongst the years. Analysis of covariance (ANCOVA) allowed for controlling pre-admission characteristics of high school GPA and ACT score indicating differences in cumulative grade point average on average between groups. ANOVA results indicated statistically significant different cumulative grade point averages between groups. Likewise, ANCOVA results indicated statistically significant differences between groups for each year when controlling for entering ability variables.

When considering persistence as measured by cumulative credits earned, two-way analysis of variance (ANOVA) was used to identify statistically significant differences
between groups. Utilization of year as an independent variable in addition to curriculum type allowed for consideration of differences amongst the years. Analysis of covariance (ANCOVA) was conducted to assess these differences when controlling for entering ability measures of high school GPA. ANOVA results indicated differences in cumulative credits earned between curriculum types. ANCOVA results indicated statistically significant differences between groups when controlling for entering ability variables.

Taken together, results indicated that the interaction between year and curriculum were not significant for both grade point average and credits earned. There were not significant differences among the students’ grade point averages and credits earned across the three years. Curriculum type served as the only significant factor in the study. The achievement pattern was consistent for living-learning communities surpassing others in each cohort for both credits earned and cumulative grade point average. The differences between living-learning communities and traditional residents yielded the smallest differences and commuters yielded the greatest negative difference amongst groups for both cumulative grade point average and credits earned.

Discussion

The results of this study provide support for the assumptions that participation in living-learning programs impacts student academic success beyond the first year of study. For the years studied, significant differences emerged between the curriculum types studied. Students who participated in the living-learning programs consistently earned
higher grade point averages than those that did not. When controlling for entering ability, these differences remained significant.

When considering group differences, living-learning community participants ($M = 2.86$) earned statistically significantly greater cumulative grade point averages than learning community participants ($M = 2.46$), traditional residents ($M = 2.69$), and traditional commuters ($M = 2.20$). When considered in the context of a four-point scale, these differences reached .66 of an earned point yielding significant impact on academic performance. When controlling for entering ability measures of high school grade point average and ACT score, the adjusted means reflect distinct differences for living-learning community participants. Adjusted means reflect living-learning community participants ($M = 2.69$) earned statistically significantly greater cumulative grade point averages than learning community participants ($M = 2.48$) and traditional commuters ($M = 2.35$). The differences reflect a difference of .21 to .35 of grade point average identifying a distinct impact on academic performance. Such differences may provide impact on student success – in many cases the difference between passing and failing.

Participants in living-learning communities consistently earned significantly greater cumulative grade point averages than non-participants. This finding provides support for existing research that suggests the connection between academic performance and persistence. In an overview of studies, Reason (2009) found that gender, race, and ethnicity, socioeconomic status, high school grade point average, college grade point average, as well as the interaction of these variables are related to persistence. Reason (2009) identified that studies that examined retention beyond the first semester of study showed college grade point average to be significant. For example, Astin, Korn, and
Green (1987) indicated that a student’s self-reported grade point average and institution reported SAT/ACT were the two strongest predictors for retention. Students with the highest SAT scores were six times more likely to graduate than students with lowest SAT scores and those with high grade averages were seven times more likely to graduate. In a study by Tross, Harper, Osher, and Kneidinger (2000), grade point average and SAT score accounted for 29% of the variance in retention. By controlling for entering ability measures, the findings of this study suggest that participants in learning communities performed better when considering these constraining variables.

In analysis of a living-learning program, Johnson and Romanoff (1999) found participant grades were slightly higher than the control group (2.57 versus 2.32) and participants earned more credits than did the control group (22.56 versus 19.31) after the first year of study. These findings were not however statistically significantly different. Program participants did, however, report significantly higher levels of satisfaction and engagement than non-participants as well as reported greater involvement on campus. Although statistical significance did not evidence, patterns of slightly greater outcomes emerged. In this study similarities were found between living-learning community grades and traditional resident grades, yet when viewed in the context of persistence, living-learning community participants with similar grades persisted at greater levels.

Interesting in the findings of the study, adjusted means for cumulative grade point average for traditional resident students were similar to living-learning community participants. Living-learning participants ($M = 2.69$) were equivalent to traditional residents ($M = 2.69$). This is consistent with the literature regarding the impact of on-campus living to student success and evidences that when both the programs and
populations grew discernable differences were noted between the impact of residential living and participation in the living-learning community program. Likewise, the impact of on-campus living without benefit of participation in other learning community types provided pronounced differences for commuter students. For each year, commuter students’ cumulative grade point averages were statistically significantly less, on average, than living-learning community and resident student participants.

The influence of the residential environment in the first year appeared to have significant impact on students. These findings are support existing research on differences between on-campus living and commuting. Compared to students who live off campus, resident students have been found to have significantly higher levels of faculty and student interaction, peer support, greater opportunities for interaction and significantly greater satisfaction and commitment. The interaction and inclusion effects of the residence halls, coupled with the fact that residence has students come better prepared to succeed, help explain why resident students are significantly more likely to persist than those living off campus (Pike et al., 1997). Differences between residents and commuters in such areas held solid when controlling for classification variables as race and high school achievement; findings suggest that residential environments may be a factor that exceeds various background variables (Pascarella & Inman, 1998). The findings of this study further suggest that the university residential environment may positively impact the student experience and influence performance outcomes.

Persistence in this study was examined in terms of cumulative credits earned. Differences were found in persistence as measured by cumulative credits completed. Prior to controlling for entering ability, living-learning communities exceeded all groups
and traditional resident students significantly exceeded commuter students. Living-learning community participants (M = 97.09) earned statistically significantly greater credits than learning community participants (M = 74.59), traditional residents (M = 83.28), and traditional commuters (M = 67.16). Mirroring grade point average finding, statistically significant differences were found between resident student credits and commuter credits. Differences were also found between residents and learning communities. Although resident students earned greater, the differences were not statistically significant. Of importance in the findings is that living-learning communities significantly outperformed learning community participants and commuters by a difference of nearly 30 credit hours or the equivalent of an academic year of study. This provides a unique distinction as the delineating line between these two curricular structures as the residential component as discussed above.

Unique in the analysis of grade point average and cumulative credits earned, when controlling for entering ability statistically significant differences did not emerge in grade point average between residents and living-learning communities but did emerge in persistence as reviewed from cumulative credits. This may be linked to the nature of the programs and the differential impact of grades as related to persistence. Similar studies have found similar results. By comparing freshman in residential learning communities to those in traditional residence hall environments, Kanoy and Bruhn (1996) found that residents in these communities had significantly higher grades than other resident students, yet did not have significantly different retention rates. Their findings noted as well the impact of population size and newness of these programs or variations in grading practices which reflected statistically in the analysis. In this study, while grades may have
not have reflected difference, the emergence of persistence and credit completion identified advantage to living-learning communities.

Living-learning communities significantly outperformed all other groups when in credits earned controlling for entering ability. In particular, living-learning community participants earned greater credits nearly the equivalent of an academic year of study as compared to commuters and greater than almost a semester for learning community participants. These findings support the assertions by Pike and Inman (1998) that the enhanced component of living environments supports greater gains. Similarly, for each year, traditional residents significantly exceeded commuter students for the greater than one semester, supporting assertions that living on campus positively impacts persistence. These findings support research that living on campus is also significantly and positively associated with persistence even when precollege factors such as high school grades are considered (Pascarella & Inman, 1998).

Results reinforce existing studies focused on the impact upon retention. Stewert (2008) found that University of Maryland College Park freshman participants’ first to second year retention for living-learning participants for the 1994 cohort 91.6% and for the 2006 cohort 96% was significantly greater for their respective rates of general population of 87% and 92.7%. Schroeder, Minor, and Tarkow (1999) reported significantly greater levels between the first and second term than non-participants with retention at 96% and non-participants at 91%. They found that participants had higher first to second year retention rates, 87% versus 81% of non-participants and significantly higher grade point averages when controlling for entering ability (Schroeder et al., 1999). Stassen (2003) found that the one year retention rate was consistently higher for learning
community participants and participants earned significantly higher grade point averages after controlling for entering ability. This study found differences in credit completion for living-learning communities over all other. Unique to this study was examination of the outcomes beyond the first year of study. Tinto (1996) reported that approximately 57% of college dropouts leave before the start of the second year and to this end, the most aggressive interventions have been staged for the first to second term, and first to second year transition of university students (Reason, 2009). Following this assertion most studies have strictly focused on first-term and first year outcomes. Attrition rates reduce by half for each year past the first year that an institution can retain a student (Reason, 2009). Given this, Pascarella and Inman (1998) suggest that longer time frames in studies are critical in reflecting college gains. Inkelas (2008) concluded that although increasing in numbers, living-learning programs have not kept pace in their methods of assessment and that research continues to grow on the benefits of participation beyond the first year of study.

To this end, there have been limited studies of the long-term impact of these programs on overall university performance as measured by cumulative grade point average and persistence to graduation. Buch and Spaulding (2008) found that mean grade point average was higher for learning community participants during the first year, but did not find the same effects beyond the first year of study. They did, however, find that the persistence rates were significantly higher beyond the first two years of study. Waldron and Yungbluth (2007) concluded that although longitudinal studies of learning communities are rare, indicators they found suggest these programs support success for some kinds of students. They found that minority students with historically higher
dropout rates, showed modest success in both persistence and academic performance than non-participants after two years of study. They found that even slight increases over time supported program intent. While limited, the emerging research suggests that longitudinal approach to examination of outcomes is required to define and support research associated with living-learning community programs.

This study, by design, specifically sought to support this growing body of research by addressing impact beyond the first year of study and considered academic year differences. Significant themes emerge from the findings of this study. Differences in academic performance and persistence were identified between living-learning communities and other learning communities, traditional residents and traditional commuters. These differences sustained throughout the duration of the academic career. These differences existed after controlling for predictors of student success. Strongest differences were found between living-learning community participants and traditional commuter students.

**Limitations of This Study**

There are several factors which may have impacted the outcomes of this study. Three are prevalent in the research: utilization of grades as measure of success, the potential for selection bias of those choosing to enroll in living-learning communities, and concerns of sample size in research. Each of these areas will be discussed in the context of this study and the analysis.

Reliance on grades as a measure of achievement may serve as limitation to studies regarding student success. While seen as the best measure in determining academic
success in the context of progression toward degree completion, concerns have been raised with regard to their equation to student success as broadly defined. Differences in grading practices among courses and institutions may impact the outcomes associated with studies utilizing them as a measure of academic success (Pike et al., 2008). The purpose of this study was to note differences amongst groups at one institution, and to this end, it is assumed that they serve as relative predictors of progression towards graduation.

Concerns have been raised in similar studies regarding the predisposition of students enrolling in such programs and propensity toward academic success. Waldron and Yungbluth (2007) indicated that students were assigned to one of the conditions during the registrations sessions. Assignment was not random but based upon student scheduling ability and availability of communities and courses. Hotchkiss et al. (2006) utilized a standard treatment effects model to determine if participation in freshman learning communities improves academic performance and retention. In their study, consideration was given to controlling for the self-selection impact on the outcomes. They indicated that assessment of program where students select to participate is complex if the students’ choice to participate was correlated with the outcome measure evaluation of the impact of the program based on raw mean comparisons may be inaccurate, with self-selection contaminating the outcome measures. They concluded that pretest measures impacted likelihood of self-selection and found a correlation between those factors that determine participation and GPA with students who are less likely to perform well as more likely to enroll in such communities. Isolating those less likely to perform well yielded greater measurable gains than holding participants constant. It is anticipated that
the analysis of covariance measures established in this study addressed the concerns identified by self-selection based upon the findings of Hotchkiss et al. (2006).

A final concern for this study is the issue of sample size and discrepancy between sub-group sizes. Waldron and Yungbluth (2007) indicated that many of the sample sizes present are increasingly small, relatively few studies compare program participants with equivalent students participating in other programs, and that few longitudinal studies that exist frequently examine beyond their period of one semester or the first year, and fewer of those examined measures of persistence and grade point average (Waldron & Yungbluth, 2007). They used a quasi-experimental longitudinal design to address this concern. The assignment to learning community and non-learning community conditions was not randomized but the equivalence of these groups was established through existing pre-testing measures. Outcome measures were taken after completion of the first semester, first academic year, and second academic year. Through proportional stratified sampling design and combination of the years with use of academic year as an independent variable, it is anticipated that some of the concerns regarding sample size were addressed.

Implications

The results of this study provide support for the assumptions that participation in living-learning programs impacts student academic success beyond the first year of study. For each year studied, significant differences emerged between the curriculum types studied. Students who participated in the living-learning programs consistently earned higher grade point averages than those that did not. When controlling for entering ability,
these differences remained significant, although traditional residents also showed strong success measures. This is consistent with the literature regarding the impact of on-campus living to student success.

The means associated with living-learning programs exceeded by up to .66 differences in mean grade point average reflecting the strength in relationship after participation. Attributing more than half a quality point to these groups denotes that participation may have significant impact on student success. Successful performance in the classroom supports persistence to graduation. The significant impact upon the student’s grade point average, may impact progress toward degree completion. Significantly and positively impacting grade performance serves as a primary driver for such programs, and these findings are significant in support of their continuance. In each instance living-learning communities and traditional resident students significantly exceeded commuter students. Living-learning communities significantly outperformed all other groups when controlling for entering ability and considering academic year of study.

Significant themes emerged from the findings of this study. Differences in academic performance and persistence were identified between living-learning communities and other learning communities, traditional residents and traditional commuters. These differences sustained throughout the duration of the academic career. These differences existed after controlling for predictors of student success. Strongest differences were found between living-learning community participants and traditional commuter students.
This study found that when controlling for entering ability, participants in living-learning communities performed better academically and persisted at higher levels than non-participants. One significant limitation arising with the popularity of living-learning communities is the connection between goodness of fit of the program to the cost-benefit analysis associated with program implementation. The guiding questions in this analysis stem from the benefit generated from the program and the implications of that benefit lasting. Specifically, the appropriateness of living-learning communities provided for all populations and the complex and often costly degree of curricular integration of implementation of such programs.

The findings of this study complement the work of others who identified similar distinctions. Inkelas and Weisman (2008) found that living-learning community participants’ perception regarding their education showed varying degrees of impact. Survey findings suggested that living-learning communities mitigated the negative preference for learning new or different social and cultural perspectives for African Americans. Latino students in these curriculum-based programs were also positively associated with openness to new or different perspectives. Unlike their white counterparts in the program, Latino and African American students perceived greater benefit of participation in the living-learning community. Inkelas and Weisman (2008) also found that students with lower high school grades were more likely to enjoy new or differing learning perspectives than those with higher grades. These findings suggested, based upon self-reported outcomes, that effectiveness of the reach of the program may have been limited to select sub-populations in the community.
Hotchkiss, Moore, and Pitts (2006) found that participation in living-learning communities positively impacted black men and interestingly moderately negatively impacted the persistence of white men. Findings were mirrored with students predicatively less prepared for academic success demonstrating enhanced grades except for white females who were better prepared academically and saw no improvement in grade performance. Nosaka (2005) found that living-learning community participation made its greatest gain in first year retention with students of color. Both studies concluded that the strongest impact of participation evidenced in disadvantaged groups and suggest tailoring programs less prepared students may be a prudent use of resources.

McKelfresh (2002) had findings similar to Hotchkiss, Moore, and Pitts (2006). The study found that women had significantly higher GPAs than men, yet males’ grades benefited at greater levels after participation than women. In fact, the data suggested that the program did not significantly impact female grades yet positively impacted male when controlling for entering ability. Similar findings were found with both males and non-white students for persistence. Participation appeared to have eliminated the gender gap improving the grades of male students without negatively impacting the female students. McKelfresh (2002) found that the predicted gap in persistence between white and non-white students by participation in the living-learning community actually raising the level of non-white student retention to a higher level rate than that of white.

Stassen (2003) found that the one year retention rate was consistently higher for learning community participants and participants earned significantly higher grade point averages even after entering ability was controlled, yielding better academic performance and persistence levels. Uniquely, these means were not found for Honors students. These
findings reinforce that when entering ability is considered, living-learning programs have the greatest significant performance measures for students who are predicted to perform less well and retain at lesser levels. The impact of the living-learning program provides the least significant support for better academically prepared students (Stassen, 2003).

Collectively, these studies concluded that participating in the living-learning community specifically benefited student groups that typically appear to be marginalized in higher education—students predicted less likely to succeed. The findings of this study support such results. Specifically, when controlling for entering ability distinct differences emerged for living-learning community participants. Assuming that the most prudent use of resources are those which provide the greatest advantage, the findings of this study suggest that focusing living-learning communities toward students least likely to succeed may provide the greatest return on student success when examining long-term impact. When differences emerge when controlling for entering ability, it can be concluded that the strongest impact of participation evidenced in disadvantaged groups and supports tailoring programs less prepared students may be a prudent use of resources. These findings are of significant benefit for institutions utilizing open access admissions policies, reliant upon public funds and retention criteria to maintain those funds for their student population. Likewise, they may create cause for concern for those programs which target students predicted to perform well and questions the impact of such programs.

Implementing living-learning programs requires use of limited and in-demand resources. The most complex, curricular-integrated programs require the resources and efforts and staff. Recent studies, however, have suggested that high degrees of curricular
integration in living-learning communities as compared to more loosely configured communities may have similar impact. For example, Inkelas and Weisman (2003) found that the outcomes associated with curriculum-based programs were not significantly different that those with less formal programs—emphasizing the experience over significance of the components and emphasized that socially oriented activities are most influential in shaping preferences. In a similar study, Stassen (2003) found that the less coordinated the living-learning community showed greater positive outcomes than more sophisticated models and fostered integration levels similar to those of more structured coordinated programs.

In this study, the living-learning programs varied by degree and intensity, yet yielded distinct and significant lasting outcomes for participants even with varying degrees of curricular and co-curricular intensity. While these findings support positive outcomes associated with living-learning communities, findings support as well that extensive resources committed to intensive curricular integration may need to be evaluated based upon desired program outcome. In many instances such intensity may be appropriate; however, findings suggest that they be considered in the context institutional academic goals and desired student outcomes.

Overall, the cost-benefit implications for offering living-learning community to increase retention are important. Of equal importance and significant reality are the resources committed to achieve desired outcomes. For example, Sidle and McReynolds (2009) found that the difference between retaining 63% of students who would otherwise persisted at a rate of 56% means that for every 100 students seven more students will return to the institution continue enrollment and continue to pay tuition and fees. Balance
must be created in offering the program, targeting the appropriate students, designing appropriate curricular integration and ultimate program costs. In open access institutions, like the institution in this study, benefit may well be added when targeting programs and resources to those students who require the most support. Investment in such programs to impact students less likely to succeed will provide the greater return on investment.

Creating and making available residence hall environment and living-learning communities requires significant investment by the institution both of capital and faculty resources. Living-learning community and traditional resident students consistently outperformed other groups when controlling for entering ability, therefore in addition to focus upon less prepared students, university resources may be well used to support faculty, staff and investment in residential facilities.

This study suggests that living on campus yields outcomes. Living on campus has been found to be significantly and positively associated with persistence even when precollege factors such as high school grades and socioeconomic status are considered (Pascarella & Inman, 1998). They, as well, have been associated to provide enhanced gains to those predicted less likely to succeed. For example, Flowers (2004) found that living on campus denoted specific gains for minority students, specifically African-Americans at predominately white institutions. Flowers found that students who lived on campus were more likely to persist in college than ones who did not. Environments which provided engaging supports and activities were linked to engaging otherwise marginalized students and accounted for 22.5% (including controlling for high school grades and GPA). Engaged communities may therefore be significant for ethnic minorities or students predicted less likely to succeed (Pizzolato, Chaudhari, Murrell,
Podobnik, & Schaeffer, 2008). These findings support retention studies that have indicated that students in residence halls persist at higher rates than do commuter, and that on-campus living accounts advantage. Living-learning community participation may well support such advantage. Institutional support of residence at specifically open access institutions becomes critical.

Coordination, support, and consistency of both faculty and staff is found to impact desired outcomes. “Simply enrolling students in common courses does not create learning communities” (Shapiro & Levine, 1999, p. 193). Shapiro and Levine (1999) identify that there has been tremendous inconsistency in the application and the quality and uses of curricula to co-curricular integration in these communities. They note that the roles of both faculty and student affairs professionals becomes critical in achieving outcomes associated with such programs. Support for such programs from both the academic and student affairs programs is noted as essential for their success.

In a number of studies, faculty participants have also noted concerns about fair compensation and equitable consideration for participation in these communities. Golde and Pribbenow (2000) found that faculty identified that the time involved for participation in living-learning programs tempered enthusiasm for continued participation. Competing university commitments with little, if any, compensation for faculty restricted their willingness for continued commitment to these programs. In fact, limited compensation or incentives for faculty involvement has been noted as the key limiting faculty enthusiasm for participation and continuation of faculty with these learning communities (Smith, Ward et al., 2004; Stassen, 2003).
Involvement in learning communities takes tremendous time and efforts and faculty often face barriers, not rewards for participation (Smith, MacGregor et al., 2004). Hurd and Stein (2004) noted that careful planning and work upon the part of administrators and faculty must be supported through compensation. The work of designing curricular and co-curricular programming, creating courses and developing specialized instruction requires significant time and effort. Additional efforts are required in coordinating, attending and supporting co-curricular experiences. In this study, one community in 2006 did not operate because of transitions with advising faculty. Loss of such involvement has distinct impact on program execution and student success. When consistent, dedicated faculty members are not involved with living-learning programs, desired outcomes for these communities may be significantly limited. This study reinforces that work with living-learning communities and support from both student affairs and academic affairs provide a framework for impact upon student success. Institutions may wish to encourage, support, and compensate faculty engagement in such programs if they are committed to achieve such outcomes.

While the literature is resplendent with research indicating the impact of living-learning programs on the academic success and persistence of first-year students, few studies have examined the impact beyond the first year of study. This study provided examination of the longitudinal outcomes for participants for three consecutive academic years. The results identified significant differences for both grade point average and cumulative credits earned through the duration of the academic year. The interactions between year and curriculum type were not significant for both grade point average and credits earned over the three years studied. The achievement pattern did not differ
between by year; living-learning communities exceeded other groups in each analysis. These findings suggest that curriculum type was the only significant factor in their analysis. Participation in living-learning communities had a positive and significant impact on measures of students’ success.

This study’s findings mirror the findings of a notable similar study conducted. In a study of the SUNY College of Environmental Science and Forestry learning community, White and Tuberville (2005) not only studied first year outcomes of participants in its living-learning program; finding significant gains in academic performance and persistence, but reviewed five years later the long-term success of the first cohort. They found that participants graduated at a 10% higher rate than non-participants and earned higher grade point averages than non-participants. This study builds upon the work of White and Tuberville (2005) in identifying the need to examine program impact in the context of institutional priorities and outcomes being academic performance supporting credit and therefore degree completion. It builds upon their work by examining multiple years of implementation to examine if consistent patterns emerged in the findings. In this study, both consistency and definition of the findings occurred when considering the outcomes associated with participation. This study supports these and similar findings that the engagement and enhanced campus experience provided by living-learning programs supports the goals of academic success and persistence throughout the duration of the academic career.

Given the results of this study in the context of existing research, several themes emerged. Use of living-learning communities provides lasting impact upon students who may be less likely to succeed. Residential environments provide support for such
programs and consistently exceeded learning community programs absent of residential components. In order to provide impact, institutions may be well served to support resources for faculty, staff and facilities that develop such programs.

**Future Research**

While this study suggests that participation in living-learning communities may be a tool for student academic success and persistence, the sample size in this study warrants further study in this area. The sample size of the living-learning community group was relatively small and larger samples would provide more robust results. Successive years of these programs showed growth in the size of the programs and may enhance the findings of this study to identify if consistent patterns emerge.

This study examined the pilot years of living-learning communities at this institution. The long-term impact through the academic career of these programs evidenced. As with most pilot programs, it should be noted that these programs evolve in their development. As the curricular and co-curricular components of the program are shaped during the pilot and successive years, so the outcomes of the program may evolve. Examination beyond the pilot years of study may provide a wider spectrum of results. Such findings support additional study of successive classes after five years of study to determine if patterns emerge and are refined.

This study examined the living-learning communities program as a whole and did not explore differences in participants based upon which of the six cohorts the students were enrolled. The small size of these subsets would limit the quality of such analysis. Future studies could employ research designs that allow for identification of differences
based upon type of living-learning community. This study did not analyze students by major because some living-learning programs were not exclusive by major and because student majors may change frequently between the beginning of their academic career and conclusion of their career. Future research may benefit from analyzing major at a specific point, entry or completion.

This study examined differences between living-learning communities, learning communities, traditional residents, and traditional commuters. By design, living-learning community students reside on campus and results evidenced strong distinction between these groups and groups that did not reside on-campus. Future studies may benefit for controlling for residential status in the analysis to further delineate the impact of such programs on student success.

This study examined outcomes measured solely on the basis of cumulative grade point average and cumulative credits earned during the academic career. This study did not explore the reflective qualitative components for students. Specifically, the underpinnings of living-learning communities lie with engagement and commitment to the academic experience. Exploration of student perceptions and reflection on the experiences impact on their university experience may add to the findings and support gains associated participation in these programs. In addition, the study does not represent those students who may have transferred to other institutions to complete their academic career; capturing their experiences may be beneficial in the analysis.

This study provides a framework for deeper analysis. The findings identify differences in performance between living-learning communities and other groups. Astin (1984) concluded that persistence and performance were linked to involvement. Tinto
(1987) identified that integration into academic and social life drive satisfaction and commitment, impacting student performance. The core of the living-learning community is based upon the integration of curricular and co-curricular activities to promote integration, satisfaction and success. Student would benefit from the results of analyzing quantitative measures of satisfaction or involvement and qualitative measures of experience. The longitudinal nature of this study allows for student reflection upon the impact of experiences as well. Retroactive use of tools such as the co-curricular transcript may add depth to consideration the impact of the experience. Taken together with the findings of this study, results of future study allow for deeper analysis of the potential meanings of the differences found and identification of impact areas.

**Conclusion**

The results indicate that living-learning communities may yield greater student outcomes than traditional instructional formats and the living component exceeds those of traditional learning communities. Although the gains were notable while some were modest, they persisted for the five years covered by this study. These results were based upon the clearest, most widely used measures of academic performance, academic grade point average and measures of retention via credit completion. These results are most consistently pronounced for students in living-learning communities even during the pilot year of the program.

The longitudinal design of the study and the availability of comparison groups are methodological strengths of the study. The inclusion of academic year as an independent variable enhances this analysis by considering differences between years. It should be
noted that studies like this should be replicated once the pilot programs stabilized and follow outcomes over successive classes of participants.

The purpose of this study was to obtain a measure of the impact of living-learning community participation on academic performance and retention throughout the duration of the academic career. It controlled for entering ability levels which have served as indicators of student academic success. It was found that there are significant differences between groups when considering such factors. Knowing more about the true impact of programs allows administrators to make more informed decisions regarding initiatives targeting accountability measures. If improving academic performance is a desirable outcome, then the evidence provided in this study strongly supports the effectiveness of living-learning programs in achieving this goal and provide lasting impact.

In today’s higher education climate in which competition for resources is intense and calls for accountably dominant activities, additional research is needed to further substantiate the need for living-learning communities. While the body of literature offers strong evidence that participation is involved with increased student involvement, academic success and retention beyond the first year of study to merit their continuance, further longitudinal studies examining academic success and retention beyond the first year should be considered to evaluate the outcomes of the residential learning communities over time to determine if their impact is immediate or lasting.


APPENDIX

IRB EXEMPTION

NOTICE OF APPROVAL

October 27, 2010

John A. Nance
720 Payne Avenue
Akron, Ohio 44322

From: Sharon McWhorter, IRB Administrator

Re: IRB Number 2010H029 "The Impact of Living Learning Communities on Academic Performance and Measures of Life"

Thank you for submitting your Exemption Request for the referenced study. Your request was approved on October 26, 2010. The protocol represents minimal risk to subjects and matches the following federal category for exemption:

☐ Exemption 1 - Research conducted in established or commonly accepted educational settings, involving normal educational practices.

☐ Exemption 2 - Research involving the use of educational tests, survey procedures, interview procedures, or observation of public behavior.

☐ Exemption 3 - Research involving the use of educational tests, survey procedures, interview procedures, or observation of public behavior not exempt under category 2, but subjects are elected or appointed public officials or candidates for public office.

☐ Exemption 4 - Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens.

☐ Exemption 5 - Research and demonstration projects conducted by or subject to the approval of department or agency heads, and which are designed to study, evaluate, or otherwise improve public programs or benefits.

☐ Exemption 6 - Taste and food quality evaluation and consumer acceptance studies.

Annual continuation applications are not required for exempt projects. If you make changes to the study's design or procedures that increase the risk to subjects or include activities that do not fall within the approved exemption category, please contact me to discuss whether or not a new application must be submitted. Any such changes or modifications must be reviewed and approved by the IRB prior to implementation.

Please retain this letter for your files. This office will hold your exemption application for a period of three years from the approval date. If you wish to continue this protocol beyond this period, you will need to submit another Exemption Request. If the research is being conducted for a master's thesis or doctoral dissertation, the student must file a copy of this letter with the thesis or dissertation.

Cc: Sharon Rice - Advisor
Cc: Stephanie Woods - IRB Chair

Office of Research Services and Sponsored Programs
Akron, OH 44325-0120
330-972-7066 - 330-972-6881 Fax

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☐ Approved consent form(s) enclosed