Learning Communities and Early Student Success

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LEARNING COMMUNITIES AND EARLY STUDENT SUCCESS

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A dissertation submitted in partial fulfillment
of the requirements for the

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Abstract

The first year of college is a time of significant transition in a student’s life. It is also the time that provides an important foundation for subsequent years. Learning communities (LCs) consist of a group of students taking two or more classes together. The classes should have some level of curricular integration as well as social interactions that support the learning environment. LCs offer opportunities for students to participate in rich educational environments and create connections to peers and faculty that may make a difference in whether students are successful in their first year of college and whether they persist to their second year. Research on learning communities is rare, given their prevalence in higher education, and few include important factors such as socioeconomic status and parental education levels.

The primary goal of this study is to examine the influence of participation in a learning community on undergraduate students’ early success at a public, research-intensive, urban commuter university. Using Astin’s Input-Environment-Outcome conceptual model as a framework, this quantitative study used secondary data representing approximately 11,000 students to investigate the relationship between environmental characteristics, including learning communities, and outcome characteristics that are indicators of early student success (i.e. total credits earned and cumulative grade point average after the first and second semesters of college, and persistence to the second year) while controlling for demographic and entering characteristics.

The major findings of this research may indicate that LCs allowed students who were from historically underperforming backgrounds to persist to the second year of college at the same rate as the rest of the population. This research found that high school GPA was most predictive of academic success in the first semester of college while first semester GPA was most predictive of academic success in the second semester of college.
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Chapter 1 - Introduction and Importance

The first year of college can be a time of significant transition and a time that provides an important foundation for subsequent years. Acclimating to a new environment, different expectations, and increasing responsibilities can create stress for students (Pancer, et.al, 2000). For some students these stressors trigger growth while others struggle to succeed. Nationally 60.6% of students reenrolled for their second year of college at the same institution which means that 39.4%, or over 1.1 million students, did not return for a second year of college (National Student Clearinghouse Research Center, 2016). Furthermore, sophomore persistence rates correlate to four and six-year graduation rates, so one way to ensure that more students who start college persist and finish, is to start by providing support to students during the first year (Sullivan, 2010).

Connections with peers, connections with faculty, and connections across the curriculum are all things that improve a student’s experience and their likelihood to persist or graduate (Pascarella & Terenzini, 2005; Rhoades, 2012). In addition, when students feel they can connect with the curriculum and understand how course material applies to their lives, they are more likely to understand and retain what they are learning (Dewey, 1943). A classroom environment that allows for interactions among students and between students and faculty enhances student learning as well.

Learning communities can provide an opportunity for students to participate in educational environments and create connections to peers and faculty that may make a difference in whether students are successful in their first year of college and return for the second year. An examination of learning communities has taken place in a variety of circumstances including learning communities that involve remedial courses, residential components, and at both two-
and four-year institutions (Jones-White et. al., 2010; Popiolek, Stein, & Eilman, 2013; Scrivener et. al., 2008; Stassen, 2003). While some of these studies accounted for characteristics such as age, race, gender, high school GPA, standardized test scores, and academic major (e.g. Hotchkiss, Moore, & Pitts, 2006), overall these studies are rare considering the prevalence of learning communities and do not account for additional important factors such as socioeconomic level. Therefore, continued exploration of learning communities is needed.

**Overview of the Study**

This chapter will provide an introduction to the research on learning communities and early student success. The chapter will highlight the importance of these programs and how they may address current issues within higher education. The purpose of the study will be presented and a brief overview of the literature related to learning communities will be provided. This research study is based upon the theoretical framework of Astin’s I-E-O conceptual model and that theory will be explained. The research questions and research design will follow. Important definitions will be provided to guide the reader throughout this dissertation. All research has limitations and the limitations of the study are provided in this chapter. Finally, the significance of this research will be reiterated.

**Purpose of the Study**

The primary goal of this study is to examine the influence of participation in a learning community on undergraduate students’ early success, namely first and second semester GPA, persistence to the second year, and total credits earned in the first year of college. Using Astin’s I-E-O conceptual model as a framework, this quantitative study investigates the relationship between environmental characteristics (participation in a learning community, academic major, residence hall living) and outcome characteristics (first and second semester GPA, persistence to
second year, total credits earned) while controlling for demographic (age, gender, ethnicity) and other entering characteristics (parents’ adjusted gross income, parent educational level, financial need, high school GPA, standardized test scores).

**Overview of the Relevant Literature**

**Learning Communities**

Gabelnick, et al. (1990) highlighted many of the benefits of learning communities. Gabelnick, et al. saw learning communities as a structural response that promotes coherence, community, and a sense of common purpose. “Learning communities are attractive because they address, in a myriad of ways, issues of curricular coherence, civic leadership, student retention, active learning, educational reform, and faculty development. They are attractive because they chip away at many of the problems all at once without requiring a massive infusion of new money or large-scale institutional reorganization” (p. 10). With a decline in the number of residential students, the classroom and curriculum must now assume the community building role that previously took place in the residence halls.

Gabelnick, et al. (1990) also noted that while all campuses can benefit from learning communities, there are specific campus types which have greater needs. “Learning communities create a unique environment of social and intellectual belonging that is important at any college; they are particularly valuable in large institutions and commuter campuses, where close personal contact and community making are problematic at best” (p. 64). Learning communities at a university with more than 20,000 students may be able to replicate some of the types of experiences that students at a small liberal arts college have due to the smaller class sizes, connections with peers, and accessibility of faculty.
Tinto (1995) found that “students in … learning community programs were more involved in a range of learning activities, learned more, and eventually persisted at a higher rate than did similar students in more traditional learning settings” (p. 12). He reported that students found academic and social support for their learning among their peers and they became actively involved in learning. Students also reported a deepened appreciation for the importance of an inclusive, supportive community in their lives. The benefits extended beyond the classroom and curricular learning. “Carefully structured learning communities can promote respect for difference – in race, sexual orientation, class – among students and faculty and a deeper appreciation of the ways in which diversity enriches the entire community” (p. 13).

In 2003, Tinto found that students in learning communities tended to form their own self-supporting groups which extended beyond the classroom. “Learning community students spent more time together out of class … in ways which students saw as supportive” (p. 5). There were not only social, but also academic and institutional benefits to this. Students made friends while learning and found group learning more enriching. They learned more – reflected in both the quantity and quality of new knowledge – and saw incredible effects on persistence rates. At one institution, “learning community students continued at a rate approximately twenty-five percentage points higher than did students in the traditional curriculum” (p. 5). An unexpected result was one related to intellectual citizenship. Students reported an increased sense of responsibility to participate in the learning experience and an awareness of their responsibility for both their learning and the learning of others.

Tinto, as well as other researchers, explored the effects of learning community participation on student persistence into the second semester and into the second year (Tinto, Goodsell, & Russo, 1994; Stassen, 2003). Others have analyzed data collected by the National
Survey on Student Engagement (NSSE) that indicated that participation in learning communities is uniformly and positively linked with student academic performance, engagement in educationally fruitful activities, gains associated with college attendance, and overall satisfaction with the college experience (Zhao & Kuh, 2004). More recently the literature has trended toward the indirect effects of learning community participation on student learning proposing a contingent relationship with student engagement (Rocconi, 2011; Pike, Kuh, & McCormick, 2011).

**Student Persistence and Retention**

Tinto (1975) introduced a theoretical, longitudinal model that examined students’ decisions to drop out from higher education and identified the factors that contribute to that decision. Tinto acknowledged that personal attributes (such as demographics and ability), precollege experiences (such as HSGPA, academic and social attainments), and family background (such as social status, values, and expectations) affect a student’s ability to be successful in college. However, Tinto stated that, more importantly, those attributes and experiences influence a student’s level of commitment to earning a college degree and graduating from a specific university. Those levels of commitment, in turn, affect (and are shaped by) the level at which students perform and are integrated, both academically and socially. Tinto (1975) posits that the extent to which academic and social integration enhance or reduce a student’s level of commitment to earning a college degree and graduating from a specific university determine whether that student will drop out or graduate. In light of Tinto’s model, learning communities can serve to increase both academic and social integration and thus reduce attrition.
Bean (1981) introduced a model of student attrition that included some components of Tinto’s, but he also drew variables based upon Price’s (1977) research on turnover in work organizations as well as Locke (1976) and Fishbein and Ajzen’s (1975) model of attitude and behavior relationships. Bean (1982) reduced the original 23 variables introduced in his 1981 version to 10 variables, all found to be significant predictors of dropping out. Bean then examined the interaction effects in a path model. He excluded background variables and ranked the independent variables that influenced dropping out. He grouped the variables as follows: organizational (grades, courses), personal (educational goals, major and job certainty), environmental (opportunity to transfer, family approval), attitudinal (loyalty, certainty, practical value), and, most significantly, intent to drop out. Bean emphasized the value of what could otherwise be perceived as an empty variable – intent. He demonstrated its value in clarifying the drop out process by aiding in the identification of direct and indirect effects of the other variables.

Though not stated in Bean’s original publications (1981, 1982), the construct “courses” represents students’ satisfaction with course offerings at an institution. Learning communities typically emphasize the applicability of course content to students’ lives and, therefore, may have a positive effect on the construct of “courses” and “practical value”.

Astin (1984) attempted to organize and simplify the literature with his theory of student involvement. He defined involvement as the “amount of physical and psychological energy that a student devotes to the academic experience” (p. 581). The investment of psychological energy is a Freudian concept that can be traced back to Aristotle (Hall & Nordby, 1973; Natali, 2013). Astin (1984) emphasized that involvement can be both quantitative and qualitative and is directly proportional to student learning and personal development. Therefore, “the effectiveness of any
educational policy or practice is directly related to the capacity of that policy or practice to increase student involvement” (p. 581). According to Astin (1984) student involvement relates to both academic and non-academic campus involvement. It further supports the tenant of active learning which is foundational to learning communities. Astin’s theory of student involvement highlights the value of connectedness between students and their classmates as well as the important relationship between students and faculty.

**Theoretical Framework**

Astin’s I-E-O model will be explored in this section as a theoretical framework for this research. The I-E-O model considers inputs, environments, and outcomes. *Inputs* include all characteristics such as demographics, as well as skills and talents that the student brings to college. Anything about the student that is measurable upon entry to the university can be considered an input. *Environments* consist of programs and other experiences that may influence a student’s growth and development while in college. These can include both academic and non-academic experiences. *Outcomes* are the myriad of accomplishments that students may achieve while in attendance. These can be as tangible as a diploma and as intangible as knowledge, skills, and attitudes. The primary focus of college impact research has been to understand how university environments influence student outcomes. Astin (1962, 1970) was the first to emphasize the importance that inputs play in this equation. Astin demonstrated that researchers were oversubscribing accountability of certain outcomes to the environment and not taking into consideration the varying inputs. Astin’s I-E-O model provides a control mechanism to more appropriately consider varying inputs, and thus more accurately attribute specific outcomes to particular environmental conditions. A more detailed explanation of the relationships among the components of this model and its historical development will be provided in Chapter 2.
Research Questions

This study addresses the following research questions relating to learning community participation and early student success:

1. What are the demographic characteristics (age, gender, ethnicity), entering characteristics (socioeconomic status, parents’ educational levels, high school GPA, standardized test scores), and other environmental characteristics (academic major, residence hall living) of students who participated in learning communities and those who did not?

2. Are demographic characteristics (age, ethnicity, gender), entering characteristics (socioeconomic status, parents’ educational levels, high school GPA, standardized test scores), or environmental characteristics (participation in a learning community, academic major, residence hall living) related to cumulative GPA after the first or second semesters or total credits earned after the first or second semesters?

3. Which combination of demographic characteristics (age, ethnicity, gender), entering characteristics (socioeconomic status, parents’ educational levels, high school GPA, standardized test scores), and environmental characteristics (participation in a learning community, academic major, residence hall living) best explain undergraduate students’ cumulative grade point averages after the first and second semesters and total credits earned after the first and second semesters?

4. Which combination of demographic characteristics (age, ethnicity, gender), entering characteristics (socioeconomic status, parents’ educational levels, high school GPA, standardized test scores), environmental characteristics (participation in a learning community, academic major, residence hall living), and outcomes (cumulative GPA after the
first or second semesters or total credits earned after the first or second semesters) best explain undergraduate students’ persistence to the second year of college?

**Research Design**

This quantitative study examines the relationship between participation in a learning community and early academic success. The early indicators of student success that are compared are first and second semester college GPA, credits earned in the first and second semesters, and persistence to the second year of college. The comparisons are made between all students across campus who participated in learning communities and those who did not. The researcher uses demographic and other entering characteristics, as well as environmental characteristics, to control for student attributes and experiences that may explain early success. This secondary data analysis study involved accessing institutional data from four points in time: the beginning of the students’ first semester (to define the population), the end of the students’ first semester (to determine college GPA and credits earned), the end of the students’ second semester (to determine college GPA and credits earned), and at the beginning of third semester (to determine persistence to the second year). Data was extracted from three institutional databases: the student information system, financial aid records, and housing records.

**Definitions**

The following definitions clarify terms used throughout the study.

*Retention*: Continuous enrollment at a college or university for three semesters. Retention (as compared to persistence) is seen as the responsibility of the institution (Tinto, 2015). Retention rates typically report fall-to-fall enrollment for first-time, full-time freshmen. A percentage is calculated based upon the total number of first-time, full-time freshmen who reenroll at the same institution one year later (FAFSA website, 2016).
Persistence: Continuous enrollment at a college or university for three semesters. Persistence (as compared to retention) is seen as the responsibility of the student (Tinto, 2015). Note: Some researchers define retention as students who reenroll in the same institution and persistence as students who transfer and enroll at another institution (Mayhew et al., 2016). That is not how those terms will be used in this study.

Learning community: The same groups of students taking two or more classes together (Brower & Dettering, 1998). “Learning communities, to be considered as such, must integrate academic subject matter and social interactions while providing the physical space or facility for an intellectually stimulating environment to emerge” (Brower & Dettering, 1998, p. 16).

Early academic success: This is a term developed for this research to refer to the quantifiable measures within the first year of college that provide an early indication that a student may go on to earn a degree from the institution. These measures include cumulative GPA after the first and second semesters (Adelman, 1999; Astin, 1993b; Heller, 2001; Horn, 1998; House, 1996; Ishitani & DesJardins, 2002), total credits earned after the first and second semesters (Mayhew, et al., 2016), and persistence to the second year at a four-year institution (NCES, 2016).

Limitations

The study has several limitations. First, all data is based upon a single institution. Findings from this study may not be generalizable at other institutions. Second, the two colleges at this institution that have learning communities have created and structured them differently. The College of Urban Affairs’ learning communities consist of three courses each while the College of Business’ learning communities consist of two courses each. All College of Urban Affairs freshmen are enrolled into a learning community but not all of these students stay
enrolled in all three courses. Whereas, approximately 20% of College of Business freshmen are enrolled into learning communities and these students are required to remain enrolled in the two courses or drop them both. (The courses are considered co-requisites and if students drop, their spot is filled by another student.) Third, assignment to a learning community is not random. College of Urban Affair students are assigned to a particular learning community based upon their intended major. College of Business students may be enrolled into a learning community by an academic advisor at new student orientation. Students who attend the new student orientation programs that take place earlier in the summer are more likely to be placed into a learning community. These students were more responsive to university communication and thus secured an earlier orientation date. These students may possess a higher level of commitment to the university. In addition, two of the four College of Business learning communities include ENG 101. Students must have earned a minimum ACT or SAT verbal score to place into ENG 101. (Otherwise they are enrolled into a two-semester sequence, ENG 101E and ENG 101F, that fulfills the same requirement as ENG 101.) Consideration of inputs used in this study should minimize the influence of the minimum verbal score requirement for certain learning communities.

**Significance of the Study**

This study accounts for a significant number and type of student characteristics while exploring the effect of learning community participation on early student success. Because learning community participation is not randomly assigned, the methodology and variables allow the researcher to identify the effect of the learning community experience while controlling for demographic, entering, and environmental characteristics.
Summary

This chapter presented an overview of the study. It highlighted the importance of this research and provided a brief overview of the relevant literature. In doing so, the reader can begin to see the gap in the literature that this study can help to fill. This chapter also outlined the purpose, theoretical framework, research questions, and research design of the study. This chapter established definitions of key terms and explained the limitations of this research. The next chapter will provide a more extensive review of the literature and elaborate on the theoretical framework.
Chapter 2 - Review of Relevant Literature

This review of the literature documents the need for inquiry and analysis of the effect of learning communities on the early academic success of college students and provides the foundation for this research. This review begins with a look at selected challenges for students, faculty, and institutions of higher education. Furthermore, it provides a brief overview of the history and philosophical underpinnings of learning communities. This review of the literature then outlines the types of learning communities and various models that have been implemented at institutions across the United States and examines the previous research that has been conducted on learning community programs. The demographic, environmental, and other characteristics that influence persistence are explored along with some models of college student persistence that have been documented. Finally, the theoretical framework for this research, Astin’s I-E-O model, is introduced and connected to this line of inquiry. This review of literature is followed by the questions that the research proposes to answer.

The primary goal of this study is to examine the influence of participation in a learning community on undergraduate students’ early academic success. This quantitative study investigates the relationship between environmental characteristics and outcome characteristics while controlling for demographic and other entering characteristics.

Challenges for Students, Faculty, and Institutions

Some students attend college and have a series of disconnected learning experiences in the classroom. Especially during the first two years of a four-year degree, many students are required to take general education courses addressing topics and subject areas in which they have little interest. Students may find it difficult to understand the practical applications of what they are learning or appreciate how the content of various classes is interrelated until they enter the
upper-division and begin to take classes in their majors. Tinto (2003) observed that “despite recent innovations, it remains the case that most students experience universities as isolated learners whose learning is disconnected from that of others. They continue to engage in solo performance and demonstration in what remains a largely show-and-tell learning environment” (p. 1). Tinto goes on to describe the undergraduate experience as a spectator sport in which “students typically take courses as detached individual units, one course separated from another in both content and peer group, one set of understandings unrelated in any intentional fashion to what is learned in other courses” (p. 1). Astin’s Theory of Involvement (1984) supports the notion that the more time and energy a student devotes to the academic experience, the more connected the student will feel, and the more likely the student will be to persist and graduate. Therefore, the disconnected experiences recognized by many higher education administrators and studied by Tinto are especially problematic.

Students are not the only members of the university community who may feel disconnected. University faculty have been characterized as demoralized, underappreciated, underpaid, disengaged, and immobile (Gabelnick, MacGregor, Matthews, & Smith, 1990). These authors go on to say that some professors experience intellectual isolationism and a sense of frustration due to disciplinary diaspora. The lack of opportunities for faculty community building, professional development, and experimentation may cause faculty to feel even more disconnected. As a result, these individuals are not able to serve as the best role models for students to become connected and engaged members of the university community. The current reward system that places a greater emphasis on research and graduate education than on teaching and the undergraduate experience also contributes to this phenomenon.
Another problem is the way that classroom teaching is usually structured. Current pedagogy supports passive over active learning, competition for grades over collaboration, and isolation over community (Cross, 1998). This does not support what we know to be the ways that students learn best. For some time now there has been a debate over whether the foundation of a liberal arts education should be based upon teaching the classics or a curriculum that represents a more inclusive, multicultural, gender-balanced, and global perspective. While there is no “right” answer, perhaps a curriculum that addresses both the classics and more contemporary writings through a balanced approach that includes student interaction and collaboration is the answer.

The days when the typical college freshman was an 18-year old white male who lived in a residence hall and attended school full-time are long gone. The current demographic and profile characteristics include a much larger representation of adult, part time, commuter, racially and ethnically diverse, and female students. Because the university experience has moved away from the more traditional, residentially-based standard, there are fewer opportunities for casual conversations in the residence hall T.V. lounge or long, drawn out debates in the dining hall over dinner. There are now structural barriers to educational excellence due to the large, impersonal, bureaucratic, and fragmented nature of the academy. Given the present circumstances, universities need to do more to encourage community, coherence, and connectedness among its students (Gabelnick et al., 1990).

In addition to challenges faced by students and faculty, there are challenges at the institutional level. Colleges and universities invest a great deal of resources, both monetary and otherwise, into the recruitment of their students and into their retention, especially throughout their first year. If students are not retained and do not graduate, the institution needs to invest
additional resources to recruit and retain more students. Private colleges with small endowments are primarily funded and operated based upon tuition dollars so these challenges are especially significant for those institutions. Institutional reputation and rankings are based upon many factors including retention and graduation rates. A cycle exists in which wise investments can benefit an institution greatly. When colleges invest effectively into programs that enhance retention, then student satisfaction and graduation rates will increase. As a result, institutional reputation and rankings are likely to increase as well. According to U.S. News and World Report (2016), retention rates account for 20-25% of the weight in the ranking process. Therefore, if universities can retain more students and rise in the rankings, they will be able to more effectively recruit a higher caliber of students who will be more likely to be retained and graduate.

While there is no claim that learning communities solve all of the challenges detailed in this section, they warrant an exploration of some definitions and types of learning communities that exist to determine whether these programs may address some of the issues summarized above.

Historical Overview and Philosophical Underpinnings of Learning Communities

The origins of learning communities can be traced back to the 1920s with philosophical underpinnings from John Dewey and experiments by Alexander Meiklejohn and Joseph Tussman. The beliefs of C. Wright Mills (1959), the establishment of Evergreen State College (1970), the writings of Paolo Freire (1973), and the research of Vincent Tinto (1987) all further substantiate and support the bases that learning is enhanced when it is interconnected, among small groups of students, and across the curriculum.
Under 19th century models of education, the teacher was an authoritarian and there was a focus on memorization. A typical classroom consisted of a teacher at the front of the room imparting knowledge to be memorized, to rows of students who were scolded if they interacted with one another during instructional time. Students were taught basic reading and math skills at the primary and secondary levels, with recitation and repetition as the predominant methods. In higher education, the focus shifted to religion and the liberal arts, however the pedagogical delivery methods remained the same. These passive approaches to learning and the failure to connect lessons to students’ lives are contrasted by the philosophies championed by John Dewey and Alexander Meiklejohn who paved the way for the types of learning communities that are in existence today.

John Dewey believed that students should be involved in their learning and promoted active education. He believed that the curriculum should be relevant to students’ lives and, as a result, students would be invested in the learning process (Dewey, 1943). Dewey believed that schools should go beyond teaching solely content knowledge; they should be a place where students learn how to become contributing members of society. Schools should not only teach skills, but the application of those skills to allow individuals to reach their full potential and use their skills for the greater good. This type of education should be the basis for creating social change and reform. Dewey believed educators should focus on the “whole person” including one’s physical, emotional, and intellectual growth. Dewey applied these principles to K-12 education and Alexander Meiklejohn applied similar ideologies to higher education (Smith, 2001). With an emphasis on an educated citizenry comprised of individuals who could improve their own lives, challenge the status quo, and develop as well-rounded individuals, Meiklejohn
launched a movement that was one of the first of its kind and included many of the basic components seen in today’s learning communities.

Alexander Meiklejohn was dean of Brown University from 1901-1912 (Mitchell, 1993) and president of Amherst College from 1912-1924 (“Presidential gallery,” n.d.). Meiklejohn’s educational background was in philosophy and he had strong, and at the time controversial, views of the purpose of higher education and the teaching methods and environments that could best serve students. These and other unconventional views led to his forced resignation as president of Amherst College (“History of the department,” n.d.). Although he was offered the presidencies of other colleges, Meiklejohn chose to go to the University of Wisconsin where he joined some of his former colleagues in an effort to implement a grand educational experiment (Mitchell, 1993).

Meiklejohn’s years in university administration were during a time of tumultuous change in American higher education. There was a shift away from the traditional focus on liberal arts (the English model) as research universities emerged. The elective system became prevalent and subunits of specialized academic departments became the predominant organizational structure (the German model). Meiklejohn believed that these administrative shifts as well as new curricular developments fragmented the learning process and made it difficult to teach interdisciplinary concepts. Furthermore, these changes made it more challenging to provide general education to the populace (Smith, 2001; Price, 2005). These new developments made it difficult to create a sense of community that engaged lower-division undergraduate students. Meiklejohn developed an Experimental College at the University of Wisconsin that stressed active learning in small groups in an attempt to build community and integrate the living and learning environments. The College used team teaching and emphasized the practical
application of knowledge, especially as it pertained to preparing students for democratic citizenship. While this experiment only lasted five years, it had a tremendous effect on its students. It was the precursor to our modern-day learning communities that emphasize many of the same core values and pedagogical concepts (Smith, 2001).

Meiklejohn authored a book entitled *The Experimental College* and reported two significant conclusions. The first was that educational planning and teaching should be conducted by small and relatively independent groups of teachers to provide coherence, unity of interest, and intention. The second conclusion was that the goal of a liberal education should be intelligence, not vocation or knowledge (Meiklejohn, 1932).

Meiklejohn’s criticisms of the shifts in higher education from English-influenced liberal arts colleges to German-inspired research universities were shared by the sociologist C. Wright Mills in *The Sociological Imagination* (1959). Mills saw what the German model was doing to education. The focus on academic departments created a status competition among disciplines which encouraged professors to overemphasize their own research and accomplishments at the expense of a broader societal focus. For sociologists, this resulted in the separation of social inquiry from the environments in which it occurred. Mills believed that sociologists and all social scientists should help people become self-educated and contribute to the world around them. As a result, Mills, like Dewey and Meiklejohn, believed that the role of the educator was to benefit society at large. “This meant that education was to cultivate both mind and spirit (that is, the whole person),” (Price, 2005).

A former student of Alexander Meiklejohn’s Experimental College, Joseph Tussman, went on to become a professor at the University of California at Berkeley. In 1965, Tussman created a new program that restructured the lower-division curriculum. He abolished courses as
the basic units of the curriculum and focused on interdisciplinary, team-taught “programs.” This required faculty to examine the content and purpose of each offering and it provided great flexibility. It changed the way faculty interacted with each other and their students (Gabelnick et. al., 1990).

In 1970, an entire institution, Evergreen State College, was created based upon the same ideas that Tussman introduced at Berkeley. Curriculum was based upon year-long learning communities called “coordinated studies” programs that were team taught and organized around interdisciplinary themes (Jones, 1981).

Shortly after the founding of Evergreen State College, Paolo Freire published Education for Critical Consciousness (1973). Through this and other works, Freire contributed greatly to educational philosophy as well as the underpinnings of learning communities. In Education for Critical Consciousness, Freire contrasts the banking model of education with the dialogic model. In the banking model, students are receptacles or recipients of information that is deposited by the teacher. In contrast, the dialogic model acknowledges that both the teachers and the students have something to contribute to the educational process. “In other words, the foundation of learning communities as places for experiential and cooperative learning that empower all students as learners — and the belief that students and teachers share responsibility for this learning — can be considered a contemporary extension of Freire’s dialogic model of educational practice” (Price, 2005).

Another researcher and author who made significant contributions to the learning communities’ movement was Vincent Tinto. Tinto is best known for his research on student attrition and student success, particularly the effect of learning communities on student growth and attainment. In Colleges as Communities: Taking Research on Student Persistence Seriously
(1998), Tinto advocates for institutions to reorganize their curriculum into learning communities to reap the following benefits: (1) students form their own supportive peer groups that extend beyond the classroom, (2) students become more actively involved in classroom learning even after class, (3) as students spend more time learning, they learn more and the quality of their learning is enhanced, and (4) some students discover their “voice” and experience a sense of validation, because this may be the first time they have been required to be actively involved in their own learning. Tinto applied research on student persistence and student success by advocating for the implementation of learning communities in higher education.

Tinto’s more recent work (2015) focuses on the difference between retention and persistence. (The key difference is that institutions seek to retain students while students seek to persist.) Almost two decades later, Tinto continues to recommend learning communities as a means to address several of the challenges that universities and their students face. He cited learning communities as an example of social support and as a vehicle through which to deliver shared academic and social experiences. Specifically, learning communities allow students to share a common bond and connect within a subgroup of the larger population. Finally, Tinto (2015) highlighted the importance of problem and project-based pedagogies. Learning communities, through their linked courses and interdisciplinary nature, provide contextualization which enhances student learning.

Gabelnick, MacGregor, Matthews, and Smith (1990) published the first book exclusively on the topic of learning communities. The next section relies heavily on their research to define the various types and models of learning communities that exist.
Types and Models of Learning Communities

Gabelnick, et al. (1990) classify learning communities into five different major types of curricular models: (1) linked courses, (2) learning clusters, (3) freshman interest groups, (4) federated learning communities, and (5) coordinated studies. Each of these models either links together existing courses or restructures the curricular material entirely to create connections across disciplines. Each of these models supports increased interaction among students and between students and faculty resulting in greater insights and more meaningful learning (Gabelnick et al., 1990). There is some variation on how these models are implemented at different universities, however they show the variety of options and types of learning communities that have been implemented successfully across the United States.

Linked courses are the simplest type of learning community and they involve the same group of students registering for two courses together. One variation involves a large lecture course and a smaller seminar in another discipline with a subset of students from the larger course. For example, a large political science lecture of 200 students may be linked with a smaller writing seminar of 25 students. Another variation involves two courses of the same size, established as co-requisites, with the same group of students in both courses. In these two variations, it is common, although not required, for one of the courses to be a writing or speech course that uses themes from the linked course to develop critical thinking and communication skills. The two linked courses may both carry the same number of credits, such as three semester-hours each, or there may be a credit disparity. An example of linked courses that carry different credit weights is a three-credit psychology course and a one-credit first-year seminar. Some benefits in this example are that the first-year seminar course addresses transitional issues such as adapting to the college environment and modifying study habits while the psychology
course references and supports this content and primarily focuses on the disciplinary content. A common pairing of a three-credit science lecture with a one-credit lab is not considered a learning community because it is not interdisciplinary in nature. Faculty of linked courses may meet one or more times either prior to or during the semester to coordinate syllabi, generate ideas for writing assignments, or discuss the best ways to develop individual students. Sometimes faculty will attend each other’s courses. Even when the curriculum of the linked courses are not strongly connected, students develop a sense of identity and community based upon their shared experiences.

Learning clusters are an expanded version of linked courses in which students take three or four of their courses together. Typically, each course is taught by a different faculty member as a discrete course. For students, learning clusters comprise a majority of their courses for the term. As with linked courses, there is a varying degree to which curricular material is integrated across the clusters. More integrated clusters may share a common text. Courses are often grouped in themes such as a cluster taught in the Honors College at Western Michigan University entitled “Human Nature” made up of Introduction to Biomedical Sciences, Thought and Writing, and General Psychology (Gabelnick et. al., 1990).

Freshmen Interest Groups (FIGs) also link three courses, however they all tend to be large courses, and the members of the FIG are a subset of each. Themes for FIGs are based on pre-major themes such as engineering, pre-med, or business. For example, twenty-five freshmen in an engineering FIG may all be enrolled in the same two large science lectures and a third math course. In addition to co-enrollment, a key feature of FIGs is a discussion leader or peer mentor who is an upper-division student majoring in the focus area of the FIG. The peer leader organizes weekly meetings to provide academic support and encourage social integration. This
model originated at the University of Oregon and is particularly effective at large universities where freshmen can get lost in a series of large lecture-style courses where they may feel that no one knows their name or cares if they succeed. FIGs provide much needed support without requiring significant resources. Faculty who teach the courses are not expected to coordinate with one another. (They may be invited to a welcome event to provide introductions.) At some institutions, the peer advisors meet as a group and receive course credit for their leadership and coordination efforts (Gabelnick et. al., 1990).

Similar to FIGs, Federated Learning Communities (FLCs) consist of smaller groups of students co-registered into three large lecture courses that are based on a common theme. The three courses are taught independently by different faculty members, however this model also includes an additional faculty member called a Master Learner. The Master Learner is from a different discipline than those represented in the federated courses. The Master Learner facilitates a three-credit seminar that links the content of the other three courses and does not teach any other courses that term. Instead the Master Learner is a co-learner in the courses that make up the FLC. The Master Learner brings a wealth of experiences and knowledge from outside areas that contribute to the learning and coordination in the FLC. The faculty members of the federated courses are not asked to alter their syllabi or coordinate in any way. They gain the benefit of receiving valuable insight from the Master Learner who can share how their course content is being interpreted. This model is much less common than the others outlined above due to the time and resources required to dedicate a faculty member for an entire semester or year to this type of program. Other lower-cost versions include a local high school teacher, on sabbatical, serving as the Master Learner or no master learner and a three-credit seminar facilitated by all three of the federated faculty members (Gabelnick et. al., 1990).
A coordinated studies program is the most comprehensive and all-encompassing type of learning community. For both faculty and students, all courses that they teach and take in a particular term are part of the coordinated studies program. They typically involve three to five faculty members who team-teach for an entire term or year. Coordinated studies programs are interdisciplinary and highly focused on active learning. The faculty-student ratio is one to 20 and the offerings are focused around themes such as Evergreen State College’s *Matter and Motion* including courses in calculus, chemistry, physics, and computer applications. While teaching and learning are interdisciplinary and integrated, credits tend to be awarded in terms of individual courses (Gabelnick et. al., 1990). Class time can be scheduled in two to four-hour blocks to allow for longer meetings times for extended learning experiences such as a film followed by a discussion or a lecture followed immediately by a lab.

Another central component of coordinated studies programs are book seminars. These are times when each faculty member meets with their small group of about twenty students to discuss the core readings and themes of the program. These are not lectures, rather they are times when faculty encourage the students to take the lead in directing group conversations by applying and integrating the program concepts. This is typically when the various components of the coordinated studies program are tied together into a more coherent “web of connections” (Gabelnick et. al., 1990, p. 30).

Faculty of coordinated studies program meet once a week to plan, explore, and collaborate. These collegial meetings involving colleagues from different disciplines are rare and appreciated in a university environment that does not typically support such collaborations. Coordinated studies programs are the most similar in design and implementation to Meiklejohn’s and Tussman’s experiments of any of the types of learning communities discussed here. They
provide an intense and integrated teaching and learning atmosphere that allows for exceptional opportunities and unparalleled ingenuity (Gabelnick et. al., 1990).

**Research on Learning Communities**

Chickering and Gamson (1987) received a great deal of attention for their *Seven Principles for Good Practice in Undergraduate Education*. According to Chickering and Gamson, “good practice in undergraduate education: (1) encourages contacts between students and faculty; (2) develops reciprocity and cooperation among students; (3) uses active learning techniques; (4) gives prompt feedback; (5) emphasizes time on task; (6) communicates high expectations; and (7) respects diverse talents and ways of learning” (1987, p. 2). The first three are particularly relevant to the study of learning communities.

Based upon the smaller class sizes and the nature of how learning communities are constructed, student-faculty contact is a central component of these initiatives. Learning communities are used as one of the examples in the original journal article for Principle #2: developing reciprocity and cooperation among students. According to Chickering and Gamson (1987), in addition to in-class learning groups and peer tutors, “learning communities are another popular way of getting students to work together” (p. 3). Chickering and Gamson’s third principle, active learning, is a key ingredient in learning communities. The emphasis on not only intellectual engagement but also social connections provides students with the networks to establish study groups and have conversations about what they are learning. Students are more likely to relate the course content to past experiences and apply it to their daily lives when they discuss it.

Gabelnick et al. (1990) highlighted many of the benefits of learning communities. Gabelnick et al. saw learning communities as a structural response that promotes coherence,
community, and a sense of common purpose. “Learning communities are attractive because they address, in a myriad of ways, issues of curricular coherence, civic leadership, student retention, active learning, educational reform, and faculty development. They are attractive because they chip away at many of the problems all at once without requiring a massive infusion of new money or large-scale institutional reorganization” (p. 10). Learning communities help address some of the newer concerns that have emerged as our campuses move away from their residential centers because the classroom and the curriculum must now assume the community building role that was previously undertaken by the college as a whole. Gabelnick et al. (1990) also noted that while all campuses can benefit from learning communities, there are specific campus types which have greater needs. “Learning communities create a unique environment of social and intellectual belonging that is important at any college; they are particularly valuable in large institutions and commuter campuses, where close personal contact and community making are problematic at best” (p. 64). Learning communities at a university with 20,000+ students may be able to replicate some of the types of experiences that students at a small liberal arts college have due to the smaller class sizes, connections with peers, and accessibility of faculty.

Tinto (1995) summarized some of the early findings out of the learning community program at LaGuardia Community College in New York City and the Coordinated Studies Program at Seattle Central Community College. “Students in the two learning community programs were more involved in a range of learning activities, learned more, and eventually persisted at a higher rate than did similar students in more traditional learning settings” (p. 12). He reported that students found academic and social support for their learning among their peers and they became actively involved in learning. Students also reported a deepened appreciation for the importance of inclusive, supportive community in their lives. The benefits extended
beyond the classroom and curricular learning. “Carefully structured learning communities can promote respect for difference – in race, sexual orientation, class – among students and faculty and a deeper appreciation of the ways in which diversity enriches the entire community” (p. 13).

In 2003, Tinto again looked at the same two learning communities at LaGuardia and Seattle Central, and added a third at the University of Washington. By this point in time, the programs had been in existence longer and he was able to generate more data and draw broader conclusions. Tinto found that students in learning communities tended to form their own self-supporting groups which extended beyond the classroom. “Learning community students spent more time together out of class … in ways which students saw as supportive” (p. 5). There were not only social, but also academic and institutional benefits to this. Students made friends while learning and found group learning more enriching. They learned more – reflected in both the quantity and quality of new knowledge – and saw incredible effects on persistence rates. At one institution, “learning community students continued at a rate approximately twenty-five percentage points higher than did students in the traditional curriculum” (p. 5). An unexpected result was one related to intellectual citizenship. Students reported an increased sense of responsibility to participate in the learning experience and an awareness of their responsibility for both their learning and the learning of others.

Tinto as well as other researchers have explored the effects of learning community participation on student persistence to the second semester and the second year of college (Bai & Pan, 2009; Hill & Woodward, 2013; Hotchkiss, Moore, & Pitts, 2006; Stassen, 2003; Tinto, Goodsell, & Russo, 1994). Stassen (2003) examined three different types of residential learning communities at one university and found increased GPAs and retention rates for all three groups, after accounting for expected differences in demographics, entering characteristics, and the
selectivity of two of the programs. While most of the research has shown positive links to 
retention for all students, Bai and Pan’s (2009) results were limited to specific populations, but 
large for those groups affected (26% more likely to persist to the second year for females, 25%
more likely to persist to the second year for students from more selective colleges). Hotchkiss,
Moore, and Pitts (2006) found increased GPAs after one year for all race-gender combinations 
except white females. The program in this study was a five-course federated learning 
community and also reported significantly increased sophomore retention rates for Black 
students. Hill and Woodward (2013) reported improved student retention rates for learning 
community participants after five semesters.

for students who participated in a year-long residential learning community and reported a 
statistically significant increase. Others have analyzed data collected by the National Survey on 
Student Engagement (NSSE) that indicated that participation in learning communities is 
uniformly and positively linked with student academic performance, engagement in 
educationally fruitful activities, gains associated with college attendance, and overall satisfaction 
with the college experience (Zhao & Kuh, 2004). Some recent literature has trended toward the 
indirect effects of learning community participation on student learning proposing a contingent 
relationship with student engagement (Rocconi, 2011; Pike, Kuh, & McCormick, 2011).

Learning community research has also been conducted at several community colleges. 
Popiolek, Fine, and Eilman (2013) controlled for instructor-related variables by looking at 
students who participated in learning communities and comparing them to students who did not 
but were taught by the same instructor. They found that students in the learning communities 
earned higher GPAs, had lower course attrition rates, and were more likely to return for their
second semester (fall-to-spring retention). A larger study included six community college programs and found more modest affects (Visher, Weiss, Weissman, Rudd, & Wathington, 2012). That research concluded no effect on persistence and a half-credit increase in total credits earned. One of the six community colleges that was included in Visher et al. was the primary focus of two different studies – a two-year follow-up conducted by Scrivener et al. (2008) and a six-year follow-up conducted by Sommo, Mayer, Rudd, and Cullinan (2012). This program at Kingsborough Community College involved three linked courses and included enhanced supports (counseling, tutoring, and textbook vouchers). Scrivener et al. reported that participation had three immediate effects: students felt more integrated and engaged, students attempted and passed more credits, and students completed developmental English requirements quicker. At the time of Scrivener et al.’s follow-up the effect on persistence was unclear. Four years later, Sommo et al. reported that graduation rates were 4.6% higher for learning community participants six years after their initial enrollment. It is unclear whether the affects were the result of the enhanced supports alone or in combination with learning community participation.

The primary goal of this study is to examine the influence of participation in a learning community on undergraduate students’ early academic success. Using Astin’s I-E-O conceptual model as a framework, this quantitative study investigates the relationship between environmental characteristics and outcome characteristics while controlling for demographic and other entering characteristics. The next section will explore the more recent literature that has identified connections between persistence to the second year of college and a number of variables that are categorized as either input (demographic or entering), environmental, or outcome characteristic.
Persistence and Retention

This section will explore the concept of college student persistence and retention by reviewing the foundational models that have emerged from the literature over the past 40 years. This section will then identify variables to consider when trying to better understand college persistence. These variables are grouped into three categories: demographic characteristics, entering characteristics, and environmental characteristics. In addition, we will look to the literature to identify appropriate measures that adequately quantify early success in higher education. These measures can also be considered outcomes.

Persistence and Retention Models

Several researchers have drawn inspiration and ideas from other disciplines in order to introduce models of college student attrition, persistence, and retention. Each model attempts to characterize the predominant components of a student’s experience that ultimately determine whether that student will graduate.

As referenced earlier, Vincent Tinto is a strong contributor to the learning community literature. He advocates for and advises on the implementation of learning communities and often uses them as exemplars within the larger context of persistence and retention of college students. Prior to the proliferation of learning communities, Tinto (1975) introduced his student integration model. Rooted in Durkeim’s theory of suicide (1961), Tinto introduced a theoretical, longitudinal model that examined students’ decisions to drop out from higher education and identified the factors that contribute to that decision. Tinto acknowledged that personal attributes (e.g., demographics and ability), precollege experiences (e.g., HSGPA, academic and social attainments), and family background (e.g., social status, values, and expectations) affect a student’s ability to be successful in college. However, Tinto stated that, more importantly, those
attributes and experiences influence a student’s level of commitment to earning a college degree and graduating from a specific university. Those levels of commitment, in turn, affect (and are shaped by) the level at which students perform and are integrated, both academically and socially. Tinto (1975) posits that the extent to which academic and social integration enhance or reduce a student’s level of commitment to earning a college degree and graduating from a specific university, determine whether that student will drop out or graduate. In light of Tinto’s model, learning communities can serve to increase both academic and social integration and thus reduce attrition.

Bean (1981) introduced a model of student attrition that included some components of Tinto’s, but he also drew variables based upon Price’s (1977) publication on turnover in work organizations as well as Locke (1976) and Fishbein and Ajzen’s (1975) model of attitude and behavior relationships. Bean (1982) reduced the original 23 variables introduced in his 1981 version to 10 variables, all found to be significant predictors of dropping out. Bean then examined the interaction effects in a path model. He excluded background variables and ranked the independent variables that influenced dropping out. He grouped the variables as follows: organizational (grades, courses), personal (educational goals, major and job certainty), environmental (opportunity to transfer, family approval), attitudinal (loyalty, certainty, practical value), and, most significantly, intent to drop out. Bean emphasized the value of what could otherwise be perceived as an empty variable – intent. He demonstrated its value in clarifying the drop out process by aiding in the identification of direct and indirect effects of the other variables.

While it is not clear in Bean’s original publications (1981, 1982), the construct “courses” appears to represent students’ satisfaction with course offerings at an institution. Learning
Astin (1984) attempted to organize and simplify the literature with his theory of student involvement. He defined involvement as the “amount of physical and psychological energy that the student devotes to the academic experience” (p. 581). The investment of psychological energy is a Freudian concept that can be traced back to Aristotle (Hall & Nordby, 1973; Natali, 2013). Astin (1984) emphasized that involvement can be both quantitative and qualitative and is directly proportional to student learning and personal development. Therefore, “the effectiveness of any educational policy or practice is directly related to the capacity of that policy or practice to increase student involvement” (p. 581). According to Astin (1984) student involvement relates to both academic and non-academic campus involvement. It further supports the tenant of active learning which is foundational to learning communities. Astin’s theory of student involvement highlights the value of connectedness between students and their classmates as well as the important relationship between students and faculty.

**Demographic Characteristics**

There are decades of research on various attributes that affect retention and persistence in higher education (Astin, 1972, Braxton, Duster, & Pascarella, 1988, DuBrock, 1999, Pascarella and Terenzini, 2005, Davidson & Petrosko, 2015). The literature refers to these variables in a variety of ways, however there are some commonalities. Most retention studies take demographics into consideration. An understanding of the effect of certain demographic characteristics on retention and completion allows researchers to better isolate and understand the influence of other independent variables.
The demographic variables that are typically considered are gender, race/ethnicity, and age. “There is no reason to think there is an intrinsic relationship between gender or race and college retention. However, controlling for these demographic characteristics allows the ability to show that correlations between certain groups and college retention may be symptomatic of other variables of interest, including measures of shared socioeconomic backgrounds” (DeNicco, Harrington, & Fog, 2015).

**Gender.** The correlation between gender and student success has changed over the decades. Research based on data sets from the early 1970s and prior showed that males were more likely to persist in higher education than females (Astin, 1972; Cope, 1971; Spady, 1970; Tinto, 1975). Beginning in the 1980s, however, research began to indicate that females were more likely to persist (Astin, 1993b; Daly & Breegle, 1989; Galicki & McEwan, 1989; Lewallen, 1993; Peltier et al., 1999; York, Bollar, & Schoob, 1999; Ishitani & DesJardin, 2002).

Between 1985 and 1995, the number of women in college increased 23 percent, whereas the number of men in college only increased 9 percent (Hansen, 1998). In 2000, Woodard, Love, and Komives wrote, “Today women have surpassed 55 percent of the student population and tend to graduate at higher rates than men.” According to the National Center for Educational Statistics (2016), about 60% of students who began seeking a bachelor’s degree at a four-year institution in fall 2008 earned that degree within six years. The percentage was higher for females (62%) than for males (57%).

Recent research is mixed – either showing that females are more likely to persist or that gender is not a statistically significant variable. Astin et al. (1987), Astin and Oseguera (2005), Corbett, Hill, and Rose (2008), Dickson (2011), and Tinto (1987) found that women had a higher probability of being retained than men. Whereas Aughinbaugh (2008), DeNicco, Harrington,
and Fogg (2015) and Harrington, Fogg, and Shaw (2009) found that gender was unrelated to college retention. They found that males and females had about the same probability of persisting through their first year of college. Other research demonstrated that females were more likely to have higher college GPAs (Wolfe, 1993) and that females were more likely to complete college (Astin, Korn & Green, 1987; Morgamen et al., 2002; Murtha, Blumberg, O’Dell & Crook, 1989; Pascarella et al., 1983). Reason (2001) found that gender interacted with other variables, such as race, and suggested that additional research needed to be conducted to explore these interactions.

**Race/Ethnicity.** The increasing diversity within higher education was both predicted and anticipated at the end of the 20th century. “Our student body will continue to become increasingly diverse throughout the first half of our new century” (Woodard, Love, & Komives, 2000, p. 39). Informed by immigration and birth rate statistics, these trends were easy for some to foresee (Keller, 2001). “This shift in demographics in the population will continue to be seen in the increase of students of color attending institutions of higher education” (Woodard, Love, & Komives, 2000, p. 39).

According to the National Center for Educational Statistics (NCES) (2016), 10.6 million students attended four-year institutions in the fall of 2014. Overall college enrollment rates for Hispanic young adults increased from 25 to 35 percent from 2004 to 2014. There were no measurable differences during the same years for any of the other racial or ethnic groups.

In 2014, the six-year bachelor’s degree completion rate by ethnicity was approximately 71% for Asians, 66% for non-resident aliens, 65% for students with two more races, 63% for Whites, 54% for Hispanics, 50% for Pacific Islanders, 41% for Blacks, and 41% for American Indians/Alaskan Natives (NCES, 2016). The NCES also reported that from 1995 to 2015 racial
gaps with respect to attainment of a bachelor’s degree (or higher) increased for 25- to 29-year olds. While the percentages of graduates increased for all racial categories, the rates increased more dramatically for White and Asian students. The NCES (2016) reported that the size of the White-Black gap widened from 13 to 22 percentage points while the size of the White-Hispanic gap widened from 20 to 27 percentage points.

Recent studies have examined racial and ethnic differences in student persistence and graduation rates, as well as first and second semester GPAs. Witkow et al. (2015) found marked ethnic differences in college persistence rates, with Asian and White students persisting at much higher rates than Hispanic students. Buddin (2012) reported that Asian/Pacific Islanders persistence rates were 5% higher and graduation rates were 7% higher than White students while Hispanic and African American students had persistence and graduation rates 10-20% lower than White students. Graduation rates reported by Keels (2013) were not as widely varied and found the highest rate for White students (92%), followed by Asian students (90%), Latino students (86%) and Black students (80%). DeNicco, Harrington, and Fogg (2015) found that Hispanic students were less likely to be retained than White students. Lewallen (1993) and Braxton, Duster, and Pascarella (1988) found that White students persisted at higher rates than non-white students. D’Amico et al. (2014) found that African-American students had lower first and second semester GPAs than White students. Hagedorn, Maxwell, and Hampton (2001) reported that Black students had lower persistence rates than White students. One study reported results inconsistent with the others cited. Ishitani and DesJardín (2002) found that non-White students had higher first to second year persistence rates than White students.

Fischer (2007) explored the differences in drop-out rates of minority students and first-generation college students who will be explored later in this section. “The fact that these
differences are only partially explained by differences in family background, resources, and academic preparation suggests that these poor outcomes emerge from events and circumstances that occur in the college environment” (p. 128). Fischer (2007) explored various types of involvement and the affects they had on different racial groups. She found that involvement in formal activities on campus (e.g., student organizations) contributed to greater satisfaction and academic success for Black and Hispanic students. These same “formal social ties” are only marginally significant for Asian students and not at all significant for White students. Fischer found that formal social involvement is positively correlated with persistence for all minority groups but not for White students. Fischer also found that minority students had more negative perceptions of the racial climate on campus than did White students.

Other research has tried to better understand the circumstances and environments that result in these academic differences by race. Steele (1997) cites stereotype threat as the mechanism by which Black students underperform academically. It is, in a sense, a self-fulfilling prophecy due to their fear of confirming negative stereotypes. Steele (1997) uses the term “disidentification with school” as a response over time to reduce the cognitive dissonance associated with decreased academic performance (p. 613). For some students that can mean declining grades resulting in academic probation or suspension while other students may conclude that college is “not for them” and voluntarily withdraw.

While it is typical to use the NCES/IPEDS categories for race/ethnicity, the categories used do not account for all students. Due to changes in immigration laws, fertility rates, and the social acceptance of inter-racial relationships over the past 40 years, the increasing multicultural, multi-ethnic make-up of the college population in the United States is more difficult to categorize (Keller, 2001).
Age. According to the National Center for Educational Statistics, in fall 2014, approximately 75% of students attending degree-granting post-secondary institutions were under the age of 25. This research focuses predominantly on that group of traditionally-aged students. There is no research that indicates a difference in persistence rates by student age within this category (under the age of 25).

There are differences between traditionally aged students (under 25 years old) and their non-traditional counterparts (25 years and older). Recent research indicates that traditionally aged college students are more likely to persist (Davidson & Petrosko, 2015). Coates (2014) found that older students had significantly higher levels of departure intention, which positively correlated with attrition. Markle (2015) confirmed that nontraditional students have significantly lower graduation rates than traditionally aged students at a four-year university.

Entering Characteristics

Entering characteristics that are most often highly correlated with persistence and most commonly found in persistence research are high school grade point average (HSGPA), standardized test scores (ACT or SAT), and socioeconomic status (e.g. family income).

High school GPA and standardized test scores. Many research studies have found high school GPA and standardized test scores to be accurate predictors of academic success and persistence in college (DuBrock, 1999; Fleming, 2002; Kim, 2002; Ishitani & DesJardins, 2002; Moffat, 1993; Ramist, Lewis, & McCamley-Jenkins, 1994; Tross et al., 2000; Wolfe & Johnson, 1995; Zheng et al., 2002; Westrick et al., 2015). Moffat (1993) found that the SAT was not a valid predictor of academic success for student over 30 years old or for Black students. Hoffman (2002) also found that the predictive strength of the SAT was not statistically significant for students of color. Other studies refuted this exception for African American students (Geiser &
Studley, 2003; Ishitani & DesJardins, 2002) and found the SAT to be predictive of college success regardless of race.

When compared, high school achievement was found to be a better predictor of college success and persistence than standardized test scores (e.g., Camara and Echternacht, 2000; Geiser & Studley, 2003; Geiser & Santelices, 2007; Hoffman & Lowitzki, 2005; Munro, 1981; Tross et al., 2000; Waugh, Micceri, & Takalkar, 1994; Zheng et al., 2002). Among the innumerable variables that have been analyzed with respect to their correlation with college success, high school performance is a better predictor than any other factor (Astin & Oseguera, 2005; Camara and Echternacht, 2000; Fleming, 2002; Geiser & Santelices, 2007; Hoffman, 2002; Munro, 1981; Zheng et al., 2002).

**Socioeconomic status.** Students from low socioeconomic (SES) families are less likely to be academically prepared for college (Cabrera & La Nasa, 2000, 2001). They are also less likely to attend college. It is believed that this is because their parents are less knowledgeable about how to plan and pay for college. Students from low SES families are more likely to attend community colleges and public four-year institutions than private colleges (Carroll, 1989). These students are less likely to persist to the second year of college and less likely to graduate (Carroll, 1989; U.S. General Accounting Office Report, 1995; Adelman, 1999; Terenzini, Cabrera, & Bernal, 2001; Morgaman et al., 2002; Ishitani & DesJardins, 2002; Ishitani, 2003; Engle & Tinto, 2008; Bowen, Chingos, & McPerson, 2009; Cabrera, Burkum, La Nasa, & Bibo, 2012; Davidson & Petrosko, 2015; Witkow, Huynh, & Fuligni, 2015). Interestingly, Paulsen and St. John (2002) found that low-income students were more likely than middle and upper income students to earn A grades but were less likely to complete their degrees. Students from low-income families are more likely to be first generation college students and come from minority
backgrounds (Terenzini, Cabrera, & Bernal, 2001). The combination of low-income and first-generation puts students at particular risk for dropping out. According to Engle and Tinto (2008), “Low-income first-generation students were nearly four times more likely – 26 to 7 percent – to leave higher education after the first year than students who had neither of these risk factors. Six years later, nearly half (43 percent) of low-income, first-generation students had left college without earning their degrees. Among those who left, nearly two-thirds (60%) did so after the first year. After six years, only 11% of low-income, first-generation students had earned bachelor’s degrees compared to 55 percent of their more advantaged peers” (p. 2).

**Parent education level.** Whether a student’s parents attended and/or graduated from college has been found to be related to the students’ likelihood to persist and graduate (Choy, 2001). First-generation college students are more likely to be non-white and from lower-income families (Choy, 2001). Some older retention studies included parents’ education levels as a component of SES (Pascarella & Chapman, 1983). More recent research may consider mother’s and father’s education level separately within categories such as: not a high school graduate, high school graduate, some college, college graduate, and graduate school. Another way that parent education level is considered is based upon whether none, one, or both parents graduated from college (Ishitani, 2003). Ishitani (2003) looked specifically at first-generation college students compared to students with one or both parents with a college degree. He found that first-generation college students had the highest attrition rates after each and every semester for the ten semesters (5 years) of a longitudinal study. Students who had two parents with college degrees had the highest persistence rates throughout the entire observation period. The gap between these two groups widened from 9% after the first semester to 22% after the sixth semester. This was a single-institution study. Ishitani (2006) broadened his scope to a national
data set and confirmed that “first-generation students were indeed more likely to depart from college than students with both college-educated parents were” (p. 870). Furthermore, “first-generation students were about 1.3 times more likely to leave their institutions than were students whose parents were college-educated. First generation students whose parents had some college education were 99% more likely to leave their initial institutions than their counterparts” (pp. 871-872).

Pike and Kuh (2005) found that first-generation college students were less engaged overall and reported making less progress in their intellectual development. This research added to the literature by deducing that most of the differences between first-generation students and their counterparts were due to differences in educational aspirations and residency status during college. In addition, Pike and Kuh recognized that first-generation college students were less likely to know about the importance of engagement and the mechanics of how to become engaged on a college campus.

Lohfink and Paulsen (2005) concluded that first-generation students were less likely to persist to the second year of college than continuing-generation students (76.5% vs. 82.2%). They also highlighted the intersections of race, income, and gender with first-generation student status. Lohfink and Paulsen noted that persistence rates were lower for first-generation students who were also Hispanic, low-income, or female, however that was not the case for continuing-generation students.

Environmental Characteristics

Residence. In How College Affects Students: A Third Decade of Research, Volume 2, Pascarella and Terenzini (2005) noted that the majority of the literature that compared the experiences of students who lived on campus with those who commuted provided evidence that
students who lived on campus were more likely to persist and graduate than students who
commuted. Some of the studies took into account precollege characteristics such as academic
success, socioeconomic status, and age while others did not. The majority of the research
conducted in the 1990s concluded that living on campus increased the likelihood of persistence
and degree completion (Astin, 1993b; Astin et al., 1996; Canabal, 1995; Christie & Dinham,
1991; King, 2002; Ryland, Riordan, & Brack, 1994; Thompson, Samiratedu, & Rafter, 1993;
Tsui, Murdock, & Mayer, 1997; Wolfe, 1993).

More recent research is mixed. In the most recent publication of *How College Affects
consider Schudde’s work “the best examination of this topic to date” (p. 399). Schudde (2011)
used propensity score matching to compare sophomore retention rates of students who lived on
and off campus. She used two national databases - ELS: 2002 and IPEDS: 2003-2004 & 2004-
2005 (NCES, 2009a; NCES, 2009b) to obtain students’ pre-college characteristics and
institutional variables, respectively. The effects found were not as strong as previous research
but still showed that students who lived on campus were 3.3% more likely to persist to the
second year of college. Oseguera and Rhee (2009) explored the effects of institutional climate
on persistence and found that living on campus increased the probability of persistence by 4.5%.
However, recent research conducted on a student population similar to the population in this
research concluded that there was no difference in GPAs, retention rates, or academic standing
between residential and commuter students on a commuter campus (Gianoutsos, 2011,
Gianoutsos & Rosser, 2014).

Analysis of additional research seems to indicate that living on campus affects retention
and graduation rates because it increases social integration or involvement (Mayhew et al.,
2016). Studies that included social integration variables did not find direct effects between living on campus and retention or degree attainment (Gray et al., 2013; Lohfink & Paulsen, 2005; Mamiseishvili, 2002). However, studies that did not include social integration measures found positive correlations between campus residence and persistence to second year or graduation (Bozick, 2007; Gross et al., 2013; Herzog, 2005; Jaeger & Eagan, 2011; Jamelske, 2009; Johnson, 2008; Jones-White, Radcliffe, Huesman, & Kellogg, 2010; Paulsen & St. John, 2002; Somers et al., 2004). The exceptions to this are studies by Titus (2004, 2006b, 2006c) who reported that the measure of involvement he used had a low reliability coefficient and should be interpreted with caution.

Given that the variables in this study do not include measures of social integration, it is appropriate to include a variable related to residence to account for this effect.

**Academic major.** It is difficult to know if and how academic major influences retention because students with certain pre-college attributes are likely drawn to specific majors (Mayhew et al., 2016). To date, extensive research on those attributes and their effects have not been studied. However, Pascarella and Terenizi (2005) did find some connection between academic major and a student’s likelihood to persist and graduate and on their time to graduation. Students majoring in the STEM fields (science, technology, engineering, and mathematics) along with those in business and health-related professions were more likely to persist and graduate than their counterparts with majors in education, humanities, and the social sciences (Adelman, 1998; DesJardins, Kim, & Rzoncak, 2003; Fenske et al., 2000; Leppel, 2002). Mayhew et al. (2016) identified additional research to corroborate these findings (Chen & DesJardin, 2010; DesJardin, Kim, & Rzonca, 2003; Jaeger & Eagan, 2011; St. John, Hu, Simmons, Carter, & Weber, 2004; Wohlgemuth et al., 2007). However, students with majors in STEM, business, and health-related
professions take longer to complete their degrees than do students in other majors (Pascarella & Terenzini, 2005). Mayhew et al. (2016) noted that these majors prepare students for higher paying jobs which may account for the increased motivation of students within these majors to succeed. Other research that found no differences in persistence rates based upon academic major (Chen, 2012; Cochran, Campbell, Baker, & Leeds, 2014; Donhardt, 2013; Hendel, 2007).

Research has also been conducted comparing persistence rates for students who have declared a major and those who are undeclared in their first year. These findings are inconsistent as well, even among research conducted by the same author on the same dataset (Titus, 2004, 2006a, 2006b). Some research concludes no difference in persistence rates between declared and undeclared students (Burgette & Magun-Jackson, 2009; McKinney & Novak, 2012; Titus, 2004, 2006a) while others found differences that were dependent upon race and year in college (St. John et al., 2004; Titus, 2006b) or institutional type (Jaeger & Eagan, 2011).

Academic Outcomes

Academic Performance. Grades earned in college are not always a reflection of student learning because they are more likely to indicate a student’s performance relative to other students (Astin, 1993b). Nevertheless, college grades are still the best predictors of persistence, graduation, and future graduate school enrollment (Pascarella & Terenzini, 2005). Adelman (1999) found that first-year grades were more predictive of degree completion than high school grades, standardized test scores, and a number of other student-related and institution-related variables. Consistent findings have been observed in several other studies based upon national samples of students (Astin, 1993b; Heller, 2001; Horn, 1998; House, 1996; Ishitani & DesJardins, 2002) and in three single-institution studies in different parts of the United States.
Credits earned.

Tinto (1975) identified academic integration as a crucial component and strong predictor of student success. One way that students demonstrate academic integration is by what Mayhew et al. (2016) call enrollment intensity. Enrollment intensity is considered full time enrollment or taking a larger number of credits and continuity of enrollment. Enrollment intensity contributes substantially and positively to persistence and degree completion (Mayhew et al., 2016). There are numerous examples in the student success literature of studies that include number of credits earned (Angrist, Lang, & Oreopoulos, 2009; Attewell, Lavin, Domina, & Levey, 2006; Bahr, 2012; Barnett et al., 2012; Bettinger & Long, 2005; Calcagno & Long, 2008; Chaney, 2010; Goldrick-Rab, Harris, Kelchen, & Benson, 2012; Hillygus, 2005; Martorell & McFarlin, 2011; Rutschow, Cullinan, & Welbeck, 2012; Scrivener & Weiss, 2013; Scrivener et al., 2008; Sommo, Mayer, Rudd, & Cullinan, 2012; Visher et al., 2010; Visher et al., 2012; Worley, 2003).

Theoretical Framework: Astin’s I-E-O Model

Astin’s I-E-O model will be explored in this section as a theoretical framework for this research. The I-E-O model considers inputs, environments, and outcomes. Each component will be defined and their relationships will be explored. In addition, a historical overview of the development of the I-E-O model is provided.

Inputs

Astin (1970) defined student inputs as “the talents, skills, aspirations, and other potentials for growth that the student brings … to college” (p. 225). He later (1993) explained them as “characteristics of the student at the initial time of entry” (p. 7). Astin’s most recent definition
(2012) is “inputs refers to those personal qualities the student brings initially to the educational program (including the student’s initial level of developed talent at the time of entry)” (p. 28). Examples of inputs are demographic characteristics such as sex and race or factors influenced by the student’s experiences and personality such as career choice and personal values. For the purpose of this research, the inputs include demographic and other entering characteristics. The demographic variables are race, age, and gender. The other entering characteristics are SES, parent education level, financial need, core high school GPA, and standardized test scores (ACT and SAT).

Environment

According to Astin (1970), the college environment specifically refers to those aspects of the institution that are capable of influencing the student. “… the environment refers to the student’s actual experiences during the educational program” (Astin, 2012, p. 28). Environments run the gamut from administrative policies and practices to physical plant to curriculum to peer relationships and much more. For the purpose of this research, the environmental variables that are considered are participation in a learning community, academic major, and residence.

Outcomes

Astin (1970) defined student outcomes as the aspects of the student’s development that the college influences or attempts to influence. In 2012, he referred to outcomes as “the talents we are trying to develop in our educational programs” (p. 28). Examples include knowledge, skills, values, attitudes, aspirations, and daily activities. For the purpose of this research, the outcome examined is early college success which is operationalized by first and second semester college GPA, persistence to the second year, and number of credits earned.
The Relationships among Inputs, Environments, and Outcomes

As shown in Figure 1, the primary relationship of interest to university personnel and researchers is Path B (Astin, 2012). However, it is essential to acknowledge that certain students select (and are selected by) certain colleges (Path A). In addition, there are characteristics that will influence what a student will learn, know, or do that exist outside of the college environment (Path C). For example, if academically talented high school students are eventually more likely to be admitted to graduate school than their less talented counterparts (Path C), we should not give full credit to their undergraduate institution for all of their success (Path B). There may, however, be programs within the college environment that increase the likelihood of application and acceptance into graduate programs for all (or even a subset of) students. The effect of such a program would appropriately be represented by Path B. The purpose of Astin’s I-E-O model is to allow us to more accurately attribute the influence of something (i.e., a program or experience) within the college environment and not oversubscribe the level of accountability of that program or experience by disregarding the qualities and characteristics that students brings with them.

The following diagram (Astin, 2012), illustrates the relationships schematically:

Figure 1. Relationship among input, environment, and outcomes

Historical Development

Astin’s I-E-O Model was first introduced in 1962 when Astin joined the National Merit Scholarship Corporation and looked at Ph. D. productivity. Previous research looked at
institutions that were more likely to produce graduates who went on to win graduate fellowships and earn Ph. Ds. However, those studies did not look at student inputs. Instead of only looking at outcomes, Holland and Astin considered student inputs as well. They determined that as far as Ph. D. output is concerned, student input is the most important determining factor. Furthermore, they were able to determine that some of the so called highly productive institutions were actually underproducing Ph. Ds. while some other institutions with more modest output were actually overproducing from what would have been expected based upon student inputs. The next logical question was to ask why and this is where an examination of the environment was needed (Astin, 1962; Astin, 2012).

In 1969, Feldman and Newcomb published a comprehensive review of research on college impact. Astin found it difficult to interpret this body of literature because of substantial methodological shortcomings. Astin responded with a two-part paper entitled The Methodology of Research on Campus Impact (1970). In this paper, Astin discussed the relationships among inputs, environments, and outcomes. This model is widely accepted and has been used extensively in college impact research since its publication (Astin & Sax, 1998; Campbell & Blakey, 1996; House, 1998; Hu & Ku, 2003; Kelly, 1996; Kim, 2001; Knight, 1994a, 1994b; Long & Amey, 1993; Thurmond, Wambach, Connors, & Frey, 2002). Astin used the I-E-O model in one of his own research studies on student participation in community service and explained the benefit as follows:

The I-E-O model was designed to address the basic methodological problem with all nonexperimental studies in the social sciences, namely the nonrandom assignment of people (inputs) to programs (environments). Because some students will be more inclined (inputs) to participate in service (the environment) than will other students, the outcomes associated with this participation may not reflect the impact of service participation, but may simply represent differences in the characteristics of students who are likely to get involved in service. We therefore examined the effects of service participation only after controlling for the effects of student input characteristics (Astin & Sax, 1998, p. 252).
Additions and elaborations came about in 1977 with the publication of *Four Critical Years* and in 1991 with *Assessment for Excellence: The Philosophy and Practice of Assessment and Evaluation in Higher Education*. In 1993, Astin published *What Matters in College: Four Critical Years Revisited*. He used his I-E-O model to better understand college impact. Astin (1993a) conducted a large-scale study with over 140 input characteristics, 192 environmental characteristics, and their effect on 82 outcomes. The work focused exclusively on four-year institutions and primarily full-time, traditional-aged students. The contributions Astin’s book provided to higher education research are enormous and expansive. In 2012 the second edition of *Assessment for Excellence* was published. In this book, Astin used his I-E-O model as a conceptual guide for assessment activities in higher education. “The basic purpose of the I-E-O design is to allow us to measure relevant input characteristics of each student and then correct or adjust for the effects of different environments on inputs” (Astin, 2012, p. 29).

**Research Questions**

1. What are the demographic characteristics (age, gender, ethnicity), entering characteristics (socioeconomic status, parents’ educational levels, high school GPA, standardized test scores), and other environmental characteristics (academic major, residence hall living) of students who participated in learning communities and those who did not?

2. Are demographic characteristics (age, ethnicity, gender), entering characteristics (socioeconomic status, parents’ educational levels, high school GPA, standardized test scores), or environmental characteristics (participation in a learning community, academic major, residence hall living) related to cumulative GPA after the first or second semesters or total credits earned after the first or second semesters?
3. Which combination of demographic characteristics (age, ethnicity, gender), entering characteristics (socioeconomic status, parents’ educational levels, high school GPA, standardized test scores), and environmental characteristics (participation in a learning community, academic major, residence hall living) best explain undergraduate students’ cumulative grade point averages after the first and second semesters and total credits earned after the first and second semesters?

4. Which combination of demographic characteristics (age, ethnicity, gender), entering characteristics (socioeconomic status, parents’ educational levels, high school GPA, standardized test scores), environmental characteristics (participation in a learning community, academic major, residence hall living), and outcomes (cumulative GPA after the first or second semesters or total credits earned after the first or second semesters best explain undergraduate students’ persistence to the second year of college?

Summary

This chapter provided a review of the relevant literature related to the topics and variables in this research of learning communities and their potential effect on college student early academic success. This review included an examination of some of the components within the higher education landscape that create challenges for students, faculty, and institutions. Furthermore, it included an overview of the history and philosophical underpinnings of learning communities. This review of the literature then outlined the types of learning communities and various models that have been implemented at institutions across the United States. The demographic, environmental, and other characteristics that influence persistence were explored along with some models of college student persistence that have been documented. Finally, the theoretical framework for this research, Astin’s I-E-O model, was introduced and connected to
this line of inquiry. This review of the literature was followed by the questions that the research proposes to answer. The next chapter will discuss the research methods and provide greater detail about the data analysis that will be performed.
Chapter 3 - Research Methods

This chapter will examine the methods used to investigate the relationship between participation in a learning community and early indicators of student success. This chapter includes the statement of purpose of the study and an overview of the research design. The data source will be described and the population used in this research will be defined. Next, the data collection procedures will be outlined. The research questions will be presented and then each variable will be described. Reliability and validity within the context of this research will be addressed. Finally, an overview of the data analysis is provided.

Purpose of the Study

The primary goal of this study is to examine the influence of participation in a learning community on undergraduate students’ early success, namely cumulative GPA after the first and second semesters, persistence to the second year, and total credits earned after the first and second semesters of college. Using Astin’s I-E-O conceptual model as a framework, this quantitative study investigates the relationship between environmental characteristics (participation in a learning community, academic major, residence hall living) and outcome characteristics (cumulative GPA after the first and second semesters, persistence to second year, total credits earned after the first and second semesters of college) while controlling for demographic (age, gender, ethnicity) and other entering characteristics (parents’ adjusted gross income, parents’ educational levels, financial need, high school GPA, standardized test scores).

Research Design

This quantitative study examines the relationship between participation in a learning community and early academic success. The early indicators of student success that are compared are cumulative GPA after the first and second semesters, total credits earned after the
first and second semesters, and persistence to the second year of college. The comparison is made between all students across campus who participated in learning communities and those who did not. The researcher uses demographic and other entering characteristics, as well as other environmental characteristics, to control for student attributes and experiences that may explain early academic success. This secondary data analysis involved accessing institutional data from four points in time: the beginning of the students’ first semester (to define the population), the end of the students’ first semester (to determine college GPA and credits earned), the end of the students’ second semester (to determine college GPA and credits earned), and at the beginning of third semester (to determine persistence to the second year). Data was extracted from three institutional databases: the student information system, financial aid records, and housing records.

**Data Source**

The institution in the study is a large, four-year public institution that is primarily nonresidential with a student population of approximately 28,600 students in fall 2015 (Carnegie Classification of Institutions of Higher Education website, 2016; Institutional website, 2016). The institution has a high enrollment of minority students and is considered a Minority Serving Institution (MSI), Hispanic Serving Institution (HSI), and Asian-American and Native-American, Pacific Islander-Serving Institution (ANAPISI) (Institutional Website, 2017). Approximately 73% of students enroll in at least 12 credits per semester and are considered full-time. Approximately 77% of students are traditionally aged (age 24 and under), and about 55% are female. Table 1 provides an overview of fall 2013, fall 2014, and fall 2015 undergraduate enrollment.
Table 1: Institutional Undergraduate Enrollment

<table>
<thead>
<tr>
<th>Undergraduate Student Profile</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full-time</td>
<td>71.5%</td>
<td>73.3%</td>
<td>73.8%</td>
</tr>
<tr>
<td>Part-time</td>
<td>28.5%</td>
<td>26.7%</td>
<td>26.2%</td>
</tr>
<tr>
<td>Age 24 and under</td>
<td>76.4%</td>
<td>77.2%</td>
<td>77.4%</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>45.5%</td>
<td>44.8%</td>
<td>44.1%</td>
</tr>
<tr>
<td>Female</td>
<td>55.5%</td>
<td>55.2%</td>
<td>55.9%</td>
</tr>
<tr>
<td>Race/Ethnicity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Indian/Native Alaskan</td>
<td>0.3%</td>
<td>0.3%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Asian</td>
<td>16.3%</td>
<td>15.4%</td>
<td>15.1%</td>
</tr>
<tr>
<td>Black/African American</td>
<td>7.6%</td>
<td>7.6%</td>
<td>7.5%</td>
</tr>
<tr>
<td>Hispanics of any race</td>
<td>23.0%</td>
<td>24.9%</td>
<td>26.2%</td>
</tr>
<tr>
<td>Native Hawaiian/Other Pacific Islander</td>
<td>1.7%</td>
<td>1.4%</td>
<td>1.3%</td>
</tr>
<tr>
<td>White</td>
<td>38.4%</td>
<td>36.6%</td>
<td>35.0%</td>
</tr>
<tr>
<td>Two or more races</td>
<td>7.6%</td>
<td>8.6%</td>
<td>9.4%</td>
</tr>
<tr>
<td>Nonresident alien</td>
<td>3.7%</td>
<td>3.7%</td>
<td>3.9%</td>
</tr>
<tr>
<td>Unknown</td>
<td>1.6%</td>
<td>1.4%</td>
<td>1.4%</td>
</tr>
</tbody>
</table>

This R2: Doctoral University with Higher Research Activity has a high undergraduate enrollment and at least 70 percent of undergraduates are enrolled full-time. The undergraduate instructional programs include professions plus Arts and Sciences with high graduate coexistence, meaning “60–79 percent of bachelor's degree majors were in professional fields, and graduate degrees were observed in at least half of the fields corresponding to undergraduate majors.” The institution is considered selective with a high transfer-in rate (Carnegie Classification of Institutions of Higher Education website, 2016).

**Population**

All first-year undergraduate students from all majors (business, education, engineering, fine arts, health sciences, hotel administration, liberal arts, sciences, undeclared, and urban
affairs) who matriculated to the university in fall 2013, fall 2014, and fall 2015 are included in this study (approximately 11,000 students). The term first-year refers to first-time freshmen enrolled in a minimum of 12 credits. Most of these students did not have any college credit prior to enrollment at the university. The only college credits that may have been earned by these students were in high school (such as Advanced Placement or dual enrollment) or the summer immediately following high school graduation (Institutional Website, 2016). The semesters of fall 2013, fall 2014, and fall 2015 were selected for four reasons. First, while the institution does have spring and summer admits, the majority of first-year students matriculate in the fall semester. Second, learning communities at this institution are predominantly designed for fall admits. Third, three years provided enough learning community participants for meaningful data analyses. Finally, the final data point came one year after the last group matriculated. Students who began college in fall 2013, fall 2014, and fall 2015 have all reached their second year of college.

The researcher identified learning communities within the colleges of business and urban affairs. These two colleges have experiences that meet the definition of learning communities with the highest enrollments at the university. No other colleges have experiences that would meet the definition of learning community for this research. In the College of Business, approximately 250 students were co-enrolled in two courses, either:

- first-year seminar and English composition or
- first-year seminar and public speaking.

According to Gabelnick, et al. (1990) the College of Business learning communities are considered linked courses. In the College of Urban Affairs, approximately 500 students were co-enrolled in three courses, either:
• first-year seminar, survey of public administration, and introduction to criminal justice or
• first-year seminar, critical analysis of mass media, and introduction to criminal justice or
• first-year seminar, survey of public administration, and personal growth.

According to Gabelnick, et al. (1990) the College of Urban Affairs learning communities are considered learning clusters. The total number of participants was approximately 750 enrolled in learning communities and approximately 9,750 not enrolled in learning communities.

For the purposes of this research, students who participated in a learning community within the colleges of business and urban affairs were identified. There are two other colleges on this campus who co-enrolled students in specific sections of English 101 and a first-year seminar course. However, the students in each section of English 101 were not all enrolled into the same section of the first-year seminar. For the purposes of this study, those students were not considered as participants in a learning community.

Data Collection Procedures

This study was submitted to the Institutional Review Board (IRB) and evaluated. Approval was granted which allowed the researcher to obtain and use data from institutional records. Data for this study were obtained from the student information system, including financial aid information, and from housing records. The researcher identified which students participated in learning communities in fall 2013, 2014, and 2015 semesters and provided that information to an institutional staff member who served as the data steward. The data steward combined the learning community data with the other variables requested and compiled the data into a single dataset. Student ID numbers were replaced by random numbers and then the data was shared with the researcher. This helped to protect the identity of individual students. Descriptions of the variables in the analyses are provided below.
Research Questions

This study addresses the following research questions related to learning community participation and early academic success:

1. What are the demographic characteristics (age, gender, ethnicity), entering characteristics (socioeconomic status, parents’ educational levels, high school GPA, standardized test scores), and other environmental characteristics (academic major, residence hall living) of students who participated in learning communities and those who did not?

2. Are demographic characteristics (age, ethnicity, gender), entering characteristics (socioeconomic status, parents’ educational levels, high school GPA, standardized test scores), or environmental characteristics (participation in a learning community, academic major, residence hall living) related to cumulative GPA after the first or second semesters or total credits earned after the first or second semesters?

3. Which combination of demographic characteristics (age, ethnicity, gender), entering characteristics (socioeconomic status, parents’ educational levels, high school GPA, standardized test scores), and environmental characteristics (participation in a learning community, academic major, residence hall living) best explain undergraduate students’ cumulative grade point averages after the first and second semesters and total credits earned after the first and second semesters?

4. Which combination of demographic characteristics (age, ethnicity, gender), entering characteristics (socioeconomic status, parents’ educational levels, high school GPA, standardized test scores), environmental characteristics (participation in a learning community, academic major, residence hall living), and outcomes (cumulative GPA after the
first or second semesters or total credits earned after the first or second semesters best explain undergraduate students’ persistence to the second year of college?

**Variables**

Recent higher education research provided cues as to which variables are likely to influence early academic success. Astin’s I-E-O Model provided a framework leading to the selection of the following variables: demographic characteristics (age, gender, ethnicity), entering characteristics (socioeconomic status, parents’ educational levels, high school GPA, standardized test scores), environmental characteristics (participation in a learning community, academic major, living on campus), cumulative GPA after the first and second semesters, total credits earned after the first and second semesters, and persistence to second year. (See Table 2.)

**Table 2:**
**Variables**

<table>
<thead>
<tr>
<th>Types of characteristics</th>
<th>Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input</td>
<td>Demographic</td>
</tr>
<tr>
<td></td>
<td>Age</td>
</tr>
<tr>
<td></td>
<td>Gender</td>
</tr>
<tr>
<td></td>
<td>Ethnicity</td>
</tr>
<tr>
<td></td>
<td>Socioeconomic status</td>
</tr>
<tr>
<td></td>
<td>Parents’ education levels</td>
</tr>
<tr>
<td></td>
<td>High school GPA</td>
</tr>
<tr>
<td></td>
<td>Standardized test scores</td>
</tr>
<tr>
<td>Environment</td>
<td>Participation in learning community</td>
</tr>
<tr>
<td></td>
<td>Academic major</td>
</tr>
<tr>
<td></td>
<td>Residence hall living</td>
</tr>
<tr>
<td>Outcome</td>
<td>First semester GPA</td>
</tr>
<tr>
<td></td>
<td>Cumulative GPA after second semester</td>
</tr>
<tr>
<td></td>
<td>Persistence to second year</td>
</tr>
<tr>
<td></td>
<td>Total credits earned in the first semester</td>
</tr>
<tr>
<td></td>
<td>Total credits earned after the second semester</td>
</tr>
</tbody>
</table>
Inputs

There are two categories of input characteristics examined in this research: demographic characteristics and entering characteristics. Each category of input characteristic consists of several variables.

Demographic characteristics.

The demographic characteristics used in this study are gender, ethnicity, and age. Each variable is discussed below.

Gender and ethnicity. Astin (1997) developed a formula to estimate institutions’ expected retention rates. Two of the four variables included in that formula are demographic in nature: gender and ethnicity. The other two are entering characteristics and will be discussed in the next section. Gender was dummy coded such that female = 1 and male = 0. Race/ethnicity data were self-reported by the student in the following categories: American-Indian or Alaska Native, Asian, Black or African American, Hispanic of any race, two or more races, non-resident alien, Native Hawaiian or Other Pacific Islander, Unknown, and White. Dummy coding was assigned for each ethnic category such that the category = 1, and all other categories = 0. For the purposes of this research, both gender and ethnicity are considered independent variables.

Age. Murtaugh, Burns, and Schuster (1999) identified an additional demographic variable, age, which can be used to help explain retention rates of university students. Age was included as a continuous, independent variable and determined based upon the start of the fall 2013, 2014, or 2015 semester.

These demographic variables were retrieved from the university’s student information system. By including these demographic variables the researcher is better able to isolate the influence of learning community participation.
Entering characteristics.

There are four types of entering characteristics used in this research – high school GPA, standardized test scores, socioeconomic status, and parents’ education levels. Each variable is discussed below.

High school GPA and standardized test scores. The other two variables identified by Astin (1997) to account for the bulk of the variance in retention were high school grades and standardized test scores. Core high school GPA (HSGPA) is included as a continuous, independent variable (0.00-4.00). Core classes included in the calculation of the HSGPA were determined by the institution to be classes in English, math, social sciences, and natural sciences. Core classes did not include physical education, art, music, foreign languages, or vocational education.

Standardized test scores are included in the form of ACT and SAT scores. Test scores are included as a continuous, independent variable.

Socioeconomic status. St. John, Cabrera, Nora, and Asker (2000) explored the effect of finance-related factors on persistence. They found, in national studies, that finance-related factors explained about half of the total variance in the persistence process. Specifically, persistence is affected by a confluence of socioeconomic status, gender, and ethnicity (Paulsen & St. John, 2002). As such, students’ parents’ adjusted gross income (AGI) and financial need are included as independent variables in this study. AGI was self-reported on the Free Application for Federal Student Aid (FAFSA) and is reported as a continuous variable. Median AGI and financial need are reported.

Parents’ education levels. Parents’ education levels have also been shown to contribute to the likelihood of student success (Choy, 2001) and, therefore, are included as categorical
variables in this study. Parents’ education levels are reported according to the categories on the FAFSA and dummy coded (0 = not indicated, 1 = less than high school graduate, 2 = high school graduate or equivalent, 3 = some college, 4 = technical school or two-year college degree, 5 = bachelor’s level degree, 6 = some graduate school, 7 = master’s level degree, 8 = doctorate, 9 = post-doctorate). Parents’ education levels are considered independent variables.

Environmental Characteristics

There are three environmental characteristics used in this study – participation in a learning community, academic major, and residence. Each variable is discussed below.

Participation in a learning community. Students who participated in a learning community within the colleges of business and urban affairs were identified. During new student orientation, academic advisors from the College of Business enrolled all new business students into at least 15 credits. Some of these students were enrolled in a learning community. Four business learning communities existed. They each consisted of two courses. Two of the business learning communities were made up of a three-credit first-year seminar course (BUS 103) and a three-credit English composition course (ENG 101). The other two business learning communities were made up of a three-credit first-year seminar course (BUS 103) and a three-credit public speaking course (COM 101). Approximately 20% of business freshmen were enrolled in one of these learning communities.

Students from the College of Urban Affairs were also enrolled into at least 15 credits during new student orientation. All urban affairs freshmen were enrolled into a learning community. Three urban affairs learning communities existed and they consisted of three courses each. All were three-credit courses. One of the urban affairs learning communities was made up of a first-year seminar (GSC 100), survey of public administration (PUA 241), and introduction to
criminal justice (CRJ 104). Another urban affairs learning community consisted of a first-year seminar (GSC 100), critical analysis of mass media (JOUR 101), and introduction to criminal justice (CRJ 104). A third urban affairs learning community was made up of a first-year seminar (GSC 100), survey of public administration (PUA 241), and personal growth (MFT 150).

For the purposes of this research, learning community participation was treated as a dichotomous, independent variable (i.e. 1 = learning community participant, 0 = no learning community participation).

**Academic major.** Students who select different majors have different experiences and levels of satisfaction. Students are able to select a major on their admissions application and this selection effects retention (Astin, 1993b; Pascarella & Terenzini, 2005). For the purpose of this research, majors are grouped by college: business, education, engineering, fine arts, health sciences, hotel administration, liberal arts, sciences, undeclared, and urban affairs. Dummy coding was assigned for each college such that the college = 1, and all other colleges = 0. Academic major is an independent variable.

**Residence hall living.** Most of the student success literature indicates that students who live in on-campus residence halls are more likely to persist (Astin, 1993b; Astin et al., 1996; Canahal, 1995; Christie & Dinham, 1991; King, 2002; Ryland et al., 1994; Thompson, Samiratedu, & Rafter, 1993; Tsui, Murdock, & Mayer, 1997; Wolfe, 1993). A small but relevant body of research has found that this does not apply, especially on predominantly commuter campuses, such as the one used in this research study (Gianoutsos & Rosser, 2014; Grayson, 1998). For the purpose of this research, residence is treated as a dichotomous, independent variable (i.e. 1 = on campus resident, and 0 = off campus resident).
Outcomes

There are five outcomes used in this research – GPA after the first semester, cumulative GPA after the second semester, credits earned in the first semester, total credits earned after the second semester, and persistence to second year. Each outcome is discussed below.

First and second semester grade point average. First-semester GPA is an essential early predictor of student success (Camara & Echternacht, 2000; Geiser & Studley, 2003; Geiser & Santelices, 2007; Gershenfeld, Ward, & Zhan, 2016; Hoffman & Lowitzki, 2005; Munro, 1981; Tross et al., 2000; Waugh et al., 1994; Zheng et al., 2002). The GPA of each student at the end of the first semester (on a scale from 0.000-4.000) was obtained from the student information system. This GPA is a continuous, dependent variable included in the second research question: “Are demographic characteristics, entering characteristics, or environmental characteristics related to cumulative GPA after the first or second semesters or total credits earned after the first or second semesters?” It is also used as a variable in research question three: “Which combination of demographic characteristics, entering characteristics, and environmental characteristics best explain undergraduate students’ cumulative grade point averages after the first and second semesters and total credits earned after the first and second semesters?”

The cumulative GPA of each student was obtained at the end of the second semester from the student information system and reported on a 0.000-4.000 scale. Similar to first-semester GPA, this variable is used as a continuous, dependent variable to answer research questions two and three.

Credits earned. Mayhew et al. (2016) address the importance of academic intensity, including the number of credits earned and the positive influence that can have on persistence
and degree completion. Total credits earned for each student were obtained at the end of the first and second semesters from the student information system and reported as continuous, dependent variables (0-34 credits). These variables are used as dependent variables to answer research questions two and three.

**Persistence.** Data was obtained from the student information system indicating whether each student enrolled in the fall semester one year after their matriculation (e.g., fall 2016 for fall 2015 freshmen). This was coded as a dichotomous variable and serves as the dependent variable for answering question four: “Which combination of demographic, other entering characteristics, environmental characteristics, and outcomes, including participation in a learning community, best explain undergraduate students’ persistence to the second year of college?”

Note about summer: At this institution, freshmen have the opportunity to enroll in classes during the summer following their first year. However, most freshmen do not take summer classes. Therefore, GPA and credits earned after summer were not collected. However, the summer months provide students with opportunities, and perhaps challenges, which require them to recommit to their institution the following fall. Therefore, persistence to the second year was determined by enrollment in the fall semester one year after matriculation and the data was obtained from the census date which falls within the first month of the semester.

**Validity and Reliability**

The variables selected for this study were drawn from the empirical research literature and based upon a recognized theoretical framework. There are direct and repeated observations that these factors are either related to (in the case of input and environmental characteristics) or indicative of (in the case of outcomes) early academic success. The goal was to include a comprehensive set of variables shown in the literature to be associated with student success.
without introducing excessive collinearity among the factors. The data is highly reliable and the sources of the data are objective and verified. Data such as GPA, standardized test scores, credits earned, and enrollment status are well-established measures within educational research. Financial data reported on the FAFSA requires verification from income tax returns. For unverified, self-reported data such as parents’ education levels, there is little to no incentive for falsification.

Data Analysis

This study addresses four research questions relating to learning community participation and early academic success. The first research question provides descriptive statistics. The second research question involved running correlations for the continuous dependent variables (GPA and credit earned). The third research question involved running regressions for the continuous dependent variables (GPA and credit earned). The fourth research question is addressed through logistic regression. Brief descriptions of correlation, multiple regression, and logistic regression are presented below.

Question #1

What are the demographic characteristics (age, gender, ethnicity), entering characteristics (socioeconomic status, parents’ educational levels, high school GPA, standardized test scores), and other environmental characteristics (academic major, residence hall living) of students who participated in learning communities and those who did not?

The first research question requires descriptions of learning community participants and students who did not participate in learning communities at the time when they started college (via demographic, entering characteristics, and other environmental characteristics). This includes age, gender, ethnicity, socioeconomic status, parents’ educational levels, high school
GPA, standardized test scores, academic major, and place of residence. This description is provided through totals and percentages, calculations of central tendency (mean, median, and mode), and dispersion (standard deviation and variance).

**Question #2**

*Are demographic characteristics (age, ethnicity, gender), entering characteristics (socioeconomic status, parents’ educational levels, high school GPA, standardized test scores), or environmental characteristics (participation in a learning community, academic major, residence hall living) related to cumulative GPA after the first or second semesters or total credits earned after the first or second semesters?*

Question two attempts to identify independent variables (demographic, entering, and/or environmental characteristics) that are related to dependent variables that can be measured after the first and second semesters of college (GPA and credits earned). This was accomplished by running a series of correlations. Comparisons are made through bivariate analysis using the Pearson product-moment correlation coefficient (r). Correlations quantify the extent to which two variables tend to change together. More specifically, “correlation is the measure of the size and direction of the linear relationship between two variables …” (Tabachnick & Fidell, 2013, pp. 55-56). Because this research includes many variables that may be highly correlated, tests of multicollinearity are included.

**Question #3**

*Which combination of demographic characteristics (age, ethnicity, gender), entering characteristics (socioeconomic status, parents’ educational levels, high school GPA, standardized test scores), and environmental characteristics (participation in a learning community, academic major, residence hall living) best explain undergraduate students’*
cumulative grade point averages after the first and second semesters and total credits earned after the first and second semesters?

Question three attempts to explain the extent of the predictive nature of the correlated variables from question two. This can be accomplished by running a series of regressions. Multiple regression was used to explain the possible effects of the independent variables (i.e., age, gender, ethnicity, socioeconomic status, parents’ educational levels, financial need, high school GPA, standardized test score, participation in a learning community, academic college, and place of residence) on first and second semester college GPA and total credits earned after the first and second semesters. Multiple regression allows researchers to determine the extent to which we can predict the value of continuous dependent variables when using both categorical and continuous independent variables.

Question #4

Which combination of demographic characteristics (age, ethnicity, gender), entering characteristics (socioeconomic status, parents’ educational levels, high school GPA, standardized test scores), environmental characteristics (participation in a learning community, academic major, residence hall living), and outcomes (cumulative GPA after the first or second semesters or total credits earned after the first or second semesters best explain undergraduate students’ persistence to the second year of college?

The fourth research question focuses on persistence to the second year of college. Because persistence is a dichotomous dependent variable (1 = retained, 0 = not retained), logistic regression was used taking into consideration each student’s age, gender, ethnicity, socioeconomic status, parents’ education levels, financial need, high school GPA, standardized test score, academic major, residence, and learning community participation.
Logistic regression was used to explain the possible effects of the independent variables (i.e., age, gender, ethnicity, socioeconomic status, parents’ educational levels, financial need, high school GPA, standardized test score, participation in a learning community, academic college, and residence) on the dependent variable - persistence to the second year. Because this dependent variable is dichotomous (1 = persisted, 0 = did not persist), logistic regression is the most appropriate technique. Logistic regression allows researchers to determine the extent to which they can predict the value of a dichotomous dependent variable when using both categorical and continuous independent variables. According to Dey and Astin (1993) logistic regression is a better choice than linear regression when studying college student retention. Linear regression is designed for research with continuous dependent variables and retention is typically a dichotomous variable. In addition, logistic regression does not require that the independent variables are normally distributed or have equal variance within each group.

Summary

This chapter began with a statement of purpose for the research. The chapter went on to discuss the methods used to examine the relationship between participation in a learning community and early academic success. Next, an overview of the research design was provided. Then, the data source was described. Subsequently, the population was defined. This detailed the ways that students became part of learning communities and the courses included in those learning communities. Within this chapter, the data collection procedures were outlined and each variable was described. Validity and reliability were discussed. Finally, the data analysis was addressed.
Chapter 4 - Results

The purpose of this study is to examine the influence of participation in a learning community on university undergraduate students’ early success, namely first and second semester GPA, persistence to the second year, and total credits earned after the first and second semesters of college. Using Astin’s I-E-O conceptual model as a framework, this quantitative study investigated the relationship between environmental characteristics (participation in a learning community, academic major, residence hall living) and outcome characteristics (first and second semester GPA, persistence to second year, total credits earned after the first and second semesters) controlling for demographic (age, gender, ethnicity) and other entering characteristics (parents’ adjusted gross income, parents’ educational level, financial need, high school GPA, standardized test scores).

This study utilized secondary institutional data that was obtained from the student information system and residential database. It was transmitted in an Excel spreadsheet and converted into a database in SPSS version 24 (2016). All first-time full-time freshmen who entered during the fall semesters of 2013, 2014, and 2015 (n = 10,972) were included. Within this dataset 7.5% of the students (822) participated in a learning community.

This chapter first provides descriptive statistics regarding the variables used in this study. Next, the results of the significant correlations found among the variables are presented. Then, the results of the linear regressions that yielded significant results are detailed. Finally, the results of the logistic regression used to explain the possible effects of the independent variables (i.e., age, gender, ethnicity, socioeconomic status, parents’ educational levels, financial need, high school GPA, standardized test score, participation in a learning community, academic
college, residence, first and second semester GPA, and total credits earned after the first and second semesters) on the dependent variable (persistence to the second year) will be presented.

**Descriptive Statistics**

**Input Characteristics**

There are two categories of input characteristics examined in this research: demographic characteristics and entering characteristics. Each category of input characteristic consists of several variables.

**Demographic Characteristics.**

**Age.** The mean age of the total population (10,972) examined in this study was 18.07 years (sd = 0.846). The mean age of the learning community participants (822) was 18.01 years (sd = 0.581). The mean age of the non-learning community participants (10,150) was 18.07 (sd = 0.864). An independent-samples t-test was conducted to compare age in learning community and non-learning community participants. There was a significant difference in the scores for learning community participants and non-learning community participants; t (8) = 2.89, p = 0.20.

**Gender.** The overall gender breakdown for the dataset was 58% female (6,364) and 42% male (4,608). The gender breakdown for the learning community participants was 59.85% female (492) and 40.15% male (330). The gender breakdown for the non-learning community participants was 57.85% female (5,872) and 42.15% male 4,278).

**Ethnicity.** Based upon self-reported data, students selected one of the nine ethnic groups: 30.59% White (3,356), 29.50% Hispanic (3,237), 17.38% Asian (1,907), 10.62% Two or more races (1,165), 7.57% Black/African American (831), 2.10% Non-resident alien (230), 1.45% Native Hawaiian/Other Pacific Islander (159), 0.59% Unknown race and ethnicity (65), and
0.20% American Indian/Alaska Native (22). The following is the ethnic composition of the learning community group: 33.82% Hispanic (278), 31.75% White (261), 11.56% Asian (95), 10.83% Black/African American (89), 9.12% Two or more races (75), 1.82% Native Hawaiian/Other Pacific Islander (15), 0.85% Unknown race and ethnicity (7), and 0.24% American Indian/Alaska Native (2).

Table 3:
Race/Ethnicity of Participants

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>LC</th>
<th></th>
<th>non-LC</th>
<th></th>
<th>Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>American Indian or Alaska Native</td>
<td>2</td>
<td>0.24%</td>
<td>20</td>
<td>0.20%</td>
<td>22</td>
<td>0.20%</td>
</tr>
<tr>
<td>Asian</td>
<td>95</td>
<td>11.56%</td>
<td>1812</td>
<td>17.85%</td>
<td>1907</td>
<td>17.38%</td>
</tr>
<tr>
<td>Black or African American</td>
<td>89</td>
<td>10.83%</td>
<td>742</td>
<td>7.31%</td>
<td>831</td>
<td>7.57%</td>
</tr>
<tr>
<td>Hispanic of any race</td>
<td>278</td>
<td>33.82%</td>
<td>2959</td>
<td>29.15%</td>
<td>3237</td>
<td>29.50%</td>
</tr>
<tr>
<td>Two or more races</td>
<td>75</td>
<td>9.12%</td>
<td>1090</td>
<td>10.74%</td>
<td>1165</td>
<td>10.62%</td>
</tr>
<tr>
<td>Non-resident alien</td>
<td>0</td>
<td>0.00%</td>
<td>230</td>
<td>2.27%</td>
<td>230</td>
<td>2.10%</td>
</tr>
<tr>
<td>Native Hawaiian or Other Pacific Islander</td>
<td>15</td>
<td>1.82%</td>
<td>144</td>
<td>1.42%</td>
<td>159</td>
<td>1.45%</td>
</tr>
<tr>
<td>Unknown race and ethnicity</td>
<td>7</td>
<td>0.85%</td>
<td>58</td>
<td>0.57%</td>
<td>65</td>
<td>0.59%</td>
</tr>
<tr>
<td>White</td>
<td>261</td>
<td>31.75%</td>
<td>3095</td>
<td>30.49%</td>
<td>3356</td>
<td>30.59%</td>
</tr>
<tr>
<td>Total</td>
<td>822</td>
<td>100.00%</td>
<td>10150</td>
<td>100.00%</td>
<td>10972</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

A chi-square test of independence was performed to examine the relationship between ethnicity and leaning community participation. The relationships were significant for the following ethnicities:

- **Asian** $X^2 (1, 10972) = -20.99$, $p < .00$
- **Black/African American** $X^2 (1, 10972) = 13.44$, $p < .00$
- **Hispanic** $X^2 (1, 10972) = 7.96$, $p < .01$
- **Non-resident alien** $X^2 (1, 10972) = -19.03$, $p < .00$
In other words, compared to the general student population, learning community students were more likely to be Black/African American or Hispanic and less likely to be Asian or non-resident alien.

**Entering characteristics.**

There are four types of entering characteristics utilized in this research: high school GPA, standardized test scores, socioeconomic status, and parents’ education levels. Each of those variables is discussed below.

**High school GPA.** The mean high school GPA in core subjects for the entire dataset was 3.45 (sd = 0.628). Learning community participants had a lower mean GPA of 3.30 (sd = 0.539). Non-learning community participants had a mean GPA of 3.47 (sd = 0.633).

**Standardized test scores.** Standardized test scores included SAT Math, SAT Reading, ACT Math, and ACT Reading. As illustrated in Table 4, the mean scores for learning community participants were lower than the mean scores for non-learning community participants in all test sections.

**Table 4: Standardized Test Scores**

<table>
<thead>
<tr>
<th></th>
<th>LC</th>
<th>non-LC</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Means</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAT Math</td>
<td>479.85</td>
<td>508.74</td>
<td>506.54</td>
</tr>
<tr>
<td>SAT Reading</td>
<td>487.50</td>
<td>502.77</td>
<td>501.61</td>
</tr>
<tr>
<td>ACT Math</td>
<td>20.49</td>
<td>21.80</td>
<td>21.71</td>
</tr>
<tr>
<td><strong>SD</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAT Math</td>
<td>79.967</td>
<td>88.873</td>
<td>88.555</td>
</tr>
<tr>
<td>SAT Reading</td>
<td>72.052</td>
<td>82.700</td>
<td>82.035</td>
</tr>
<tr>
<td>ACT Math</td>
<td>3.666</td>
<td>4.563</td>
<td>4.516</td>
</tr>
<tr>
<td>ACT English</td>
<td>4.309</td>
<td>5.083</td>
<td>5.040</td>
</tr>
</tbody>
</table>
**Socioeconomic status.** For the purposes of this study, variables that were used to determine socioeconomic status were Parents’ Adjusted Gross Income (AGI) and Financial Need, as calculated by the Office of Financial Aid.

The median AGI for the entire data set was $52,764. Learning community participants had a lower median AGI of $48,340. Non-learning community participants had a median AGI of $53,054.

Median financial need for the entire data set was $14,642. Learning community participants had a higher median financial need of $15,344. Non-learning community participants had a median financial need of $14,590.

**Parents’ education levels.** Parent education levels were obtained for both mothers and fathers. The categories used were expanded between 2014 and 2015. Therefore, the data from the 2013 and 2014 cohorts had fewer categories than the data from 2015. In 2013 and 2014, the five categories were: not indicated, less than high school graduate, high school graduate or equivalent, some college, and bachelor’s level degree. In 2015, the following additional categories were added to the original five: technical school, two-year college degree, some graduate school, master’s level degree, doctorate (academic), doctorate (professional), and post-doctorate. It is likely that the category of bachelor’s level degree from the 2013 and 2014 data sets was actually bachelor’s degree or higher and converted when the additional categories were added in 2015.

This section will report education levels for students’ mothers and fathers at two levels: (1) bachelor’s degree or higher and (2) high school graduate or equivalent. A summary table of data at all levels of education is provided in Appendix Table A-1.
Mothers. For the entire dataset, 31% of students (3,393) reported that their mothers had a bachelor’s degree or higher. For students who participated in learning communities, 24% (198) reported that their mothers had a bachelor’s degree or higher. For non-learning community participants, 31% (3,195) reported that their mothers had a bachelor’s degree or higher.

For the entire dataset, 27% (2,988) of students reported that their mothers were high school graduates or equivalent. For students who participated in learning communities, 32% (267) reported that their mothers were high school graduates or equivalent compared to 27% (2,721) of non-learning community participants.

Fathers. For the entire dataset, 28% (3,049) of students reported that their fathers had a bachelor’s degree or higher. For students in learning communities, 21% (176) reported that their fathers had a bachelor’s degree or higher. For non-learning community participants, 28% (2,873) reported that their fathers had a bachelor’s degree or higher.

For the entire dataset, 29% (3,196) of students reported that their fathers were high school graduates or equivalent. For students in learning communities, 32% (267) reported that their fathers were high school graduates or equivalent compared to 29% (2,929) of non-learning community participants.

In other words, students who participated in learning communities were less likely to report that their parents had a bachelor’s degree or higher and more likely to report that their parents were high school graduates or equivalent.

Environmental Characteristics

In addition to learning community participation, the environmental characteristics considered in this research were academic major and residence. Both of those variables are discussed below.
**Academic Major.** The two colleges that had learning community programs were the College of Urban Affairs and the College of Business. The Urban Affairs curriculum was designed such that the majority of the freshmen, 72% (547), participated in learning communities. In the College of Business, 20% (267) of the freshmen participated in learning communities.

Overall, students entered the university at the following rates: 15% College of Sciences (1605), 12% College of Business (1335), 12% Undeclared (1262), 11% College of Engineering (1211), 10% Nursing (1045), 9% College of Liberal Arts (1005), 8% College of Fine Arts (856), 7% Allied Health Sciences (777), 7% College of Urban Affairs (759), 7% College of Hotel Administration (742), 3% College of Education (313), and 1% Community Health Sciences (62).

**Residence.** The university selected for this research is primarily a commuter institution. For the entire dataset, 75% of students commuted (8273) and 25% lived on campus (2699). For learning community participants, 78% commuted (642) and 22% lived on campus (180). For non-learning community participants, 75% commuted (7631) and 25% lived on campus (2519). Overall, learning community participants lived on campus at a lower rate than the general population.

**Correlations**

The second research question was: Are demographic characteristics (age, ethnicity, gender), entering characteristics (socioeconomic status, parents’ educational levels, high school GPA, standardized test scores), or environmental characteristics (participation in a learning community, academic major, residence hall living) related to cumulative GPA after the first or second semesters or total credits earned after the first or second semesters? Correlations found to be moderate ($0.31 \leq |r| \leq 0.50$) or small ($0.10 \leq |r| \leq 0.30$) and involving one of the four
dependent variables included in the second research question are reported below. There were no correlations between an independent variable and one of the four dependent variables that would be considered strong (\(| r | \geq .51\)).

In this study, moderate correlations were found between high school GPA and each of the four dependent variables: 1\(^{st}\) semester GPA (Pearson’s \(r = .42, p < .01\)), 2\(^{nd}\) semester GPA (Pearson’s \(r = .47, p < .01\)), 1\(^{st}\) semester cumulative credits (Pearson’s \(r = .45, p < .01\)), and 2\(^{nd}\) semester cumulative credits (Pearson’s \(r = .50, p < .01\)).

Second semester GPA was found to be moderately correlated with ACT Math (Pearson’s \(r = .31, p < .01\)) and ACT English (Pearson’s \(r = .32, p < .01\)).

First semester cumulative credits were found to be moderately correlated with all standardized test scores: SAT Math (Pearson’s \(r = .40, p < .01\)), SAT Reading (Pearson’s \(r = .37, p < .01\)), ACT Math (Pearson’s \(r = .39, p < .01\)), ACT English (Pearson’s \(r = .38, p < .01\)).

Second semester cumulative credits were also found to be moderately correlated with all standardized test scores: SAT Math (Pearson’s \(r = .41, p < .01\)), SAT Reading (Pearson’s \(r = .37, p < .01\)), ACT Math (Pearson’s \(r = .42, p < .01\)), ACT English (Pearson’s \(r = .41, p < .01\)).

Smaller but still significant correlations were found between 1\(^{st}\) semester GPA and Black students (Pearson’s \(r = -.11, p < .01\)) and between 1\(^{st}\) semester GPA and Asian students (Pearson’s \(r = .10, p < .01\)). First semester GPA was also found to be correlated to all test scores: SAT Math (Pearson’s \(r = .21, p < .01\)), SAT Reading (Pearson’s \(r = .21, p < .01\)), ACT Math (Pearson’s \(r = .26, p < .01\)), ACT English (Pearson’s \(r = .27, p < .01\)).

Second semester GPA was found to be correlated to: Black students (Pearson’s \(r = -.12, p < .01\)), financial need (Pearson’s \(r = -.12, p < .01\)), gender (Pearson’s \(r = .11, p < .01\)), Asian
students (Pearson’s $r = .11, p < .01$), SAT Math (Pearson’s $r = .25, p < .01$), and SAT Reading (Pearson’s $r = .26, p < .01$).

First semester cumulative credits were found to be correlated to financial need (Pearson’s $r = -.10, p < .01$) and Black students (Pearson’s $r = -.10, p < .01$).

Second semester cumulative credits were found to be correlated to Black students (Pearson’s $r = -.11, p < .01$), financial need (Pearson’s $r = -.13, p < .01$), Asian students (Pearson’s $r = .10, p < .01$), and Parents’ AGI (Pearson’s $r = .10, p < .01$).

A table of all significant correlations can be found in Appendix Table A-2.

**Linear Regressions**

The third research question was: Which combination of demographic characteristics (age, ethnicity, gender), entering characteristics (socioeconomic status, parents’ educational levels, high school GPA, standardized test scores), and environmental characteristics (participation in a learning community, academic major, residence hall living) best explain undergraduate students’ cumulative grade point averages (GPAs) after the first and second semesters and total credits earned after the first and second semesters? Linear regressions were calculated to find the best fit in an attempt to predict cumulative GPA after the first and second semesters and total credits earned after the first and second semesters. Tests of multicollinearity were run and regressions were re-run to exclude variables for which tolerance was < .2. Variables excluded were first and second semester cumulative credits from the regression for second semester GPA.

**Cumulative GPA after the First Semester**

A stepwise multiple linear regression was calculated to predict cumulative GPA after the first semester based on several independent variables. The best fit model found included the following independent variables: learning community participation, age, parents’ AGI, first
semester cumulative credits, high school GPA and academic major. A significant regression
equation was found (F(16, 6984) = 194.215, p < .001), with R² = .308. About 31% of the
variance in first semester college GPA was accounted for by the independent variables included
in this regression. All but one of the academic majors as represented by college of initial
enrollment were included for comparison purposes. This demonstrated that majors in the
following colleges had significant and positive predictive results: Allied Health Sciences,
College of Business, College of Education, College of Engineering, College of Fine Arts,
College of Hotel Administration, College of Liberal Arts, College of Urban Affairs, School of
Nursing, and Undeclared majors. Table 5 provides the linear regression results for cumulative
GPA after the first semester.
Table 5:

Results of Linear Regression of Input and Environmental Variables on GPA after First Semester

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>SE B</th>
<th>β</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-.45</td>
<td>.25</td>
<td>-1.80</td>
<td>0.072</td>
<td></td>
</tr>
<tr>
<td>LC Participation Level</td>
<td>.11</td>
<td>.06</td>
<td>0.03</td>
<td>1.90</td>
<td>0.057</td>
</tr>
<tr>
<td>Age</td>
<td>.03*</td>
<td>.01</td>
<td>0.02</td>
<td>2.26</td>
<td>0.024</td>
</tr>
<tr>
<td>Parents’ AGI</td>
<td>5.69E-07***</td>
<td>.00</td>
<td>0.04</td>
<td>4.06</td>
<td>0.000</td>
</tr>
<tr>
<td>1st semester cumulative credits</td>
<td>.04***</td>
<td>.00</td>
<td>0.35</td>
<td>31.01</td>
<td>0.000</td>
</tr>
<tr>
<td>High school GPA</td>
<td>.48***</td>
<td>.02</td>
<td>0.30</td>
<td>26.05</td>
<td>0.000</td>
</tr>
<tr>
<td>Allied Health Sciences majors</td>
<td>.12*</td>
<td>.05</td>
<td>0.03</td>
<td>2.51</td>
<td>0.012</td>
</tr>
<tr>
<td>College of Business majors</td>
<td>.20***</td>
<td>.42</td>
<td>0.07</td>
<td>4.90</td>
<td>0.000</td>
</tr>
<tr>
<td>College of Education majors</td>
<td>.30***</td>
<td>.06</td>
<td>0.05</td>
<td>4.65</td>
<td>0.000</td>
</tr>
<tr>
<td>College of Engineering majors</td>
<td>.15***</td>
<td>.04</td>
<td>0.05</td>
<td>3.66</td>
<td>0.000</td>
</tr>
<tr>
<td>College of Fine Arts majors</td>
<td>.53***</td>
<td>.05</td>
<td>0.14</td>
<td>11.80</td>
<td>0.000</td>
</tr>
<tr>
<td>College of Health Sciences majors</td>
<td>.02</td>
<td>.14</td>
<td>0.00</td>
<td>-0.16</td>
<td>0.874</td>
</tr>
<tr>
<td>College of Hotel Administration majors</td>
<td>.51***</td>
<td>.05</td>
<td>0.12</td>
<td>10.37</td>
<td>0.000</td>
</tr>
<tr>
<td>College of Liberal Arts majors</td>
<td>.28***</td>
<td>.04</td>
<td>0.08</td>
<td>6.41</td>
<td>0.000</td>
</tr>
<tr>
<td>College of Urban Affairs majors</td>
<td>.23***</td>
<td>.06</td>
<td>0.06</td>
<td>3.74</td>
<td>0.000</td>
</tr>
<tr>
<td>School of Nursing majors</td>
<td>.31***</td>
<td>.04</td>
<td>0.09</td>
<td>7.49</td>
<td>0.000</td>
</tr>
<tr>
<td>Undeclared majors</td>
<td>.43***</td>
<td>.04</td>
<td>0.13</td>
<td>10.53</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Notes: R² = .22
LC = Learning community, AGI = Adjusted Gross Income
* p < .05, ** p < .01, ***p < .001
Cumulative GPA after the Second Semester

A stepwise multiple linear regression was calculated to predict cumulative GPA after the second semester based on several independent variables. The best fit model found included the following independent variables: learning community participation, residence, gender, Black students, Hispanic students, Allied Health Science majors, high school GPA, first semester GPA. A significant regression equation was found \( F(8, 7131) = 2541.604, p < .000 \), with \( R^2 = .740 \). About 74% of the variance in second semester college GPA was accounted for by the independent variables included in this regression. Table 6 provides the linear regression results for cumulative GPA after the second semester.

Table 6:
Results of Linear Regression of Input and Environmental Variables on Cumulative GPA after Second Semester

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>SE B</th>
<th>( \beta )</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.12***</td>
<td>0.03</td>
<td>0.03</td>
<td>3.95</td>
<td>0.000</td>
</tr>
<tr>
<td>LC Participation Level</td>
<td>-0.03</td>
<td>0.02</td>
<td>-0.01</td>
<td>-1.72</td>
<td>0.085</td>
</tr>
<tr>
<td>Residence</td>
<td>0.04**</td>
<td>0.01</td>
<td>0.02</td>
<td>3.28</td>
<td>0.001</td>
</tr>
<tr>
<td>Gender</td>
<td>0.01</td>
<td>0.01</td>
<td>0.01</td>
<td>0.88</td>
<td>0.377</td>
</tr>
<tr>
<td>Black</td>
<td>-0.04</td>
<td>0.02</td>
<td>-0.01</td>
<td>-1.88</td>
<td>0.060</td>
</tr>
<tr>
<td>Hispanic</td>
<td>-0.02</td>
<td>0.01</td>
<td>-0.01</td>
<td>-1.57</td>
<td>0.117</td>
</tr>
<tr>
<td>Allied Health Sciences majors</td>
<td>0.04</td>
<td>0.02</td>
<td>0.01</td>
<td>1.83</td>
<td>0.067</td>
</tr>
<tr>
<td>High school GPA</td>
<td>0.17***</td>
<td>0.01</td>
<td>0.13</td>
<td>18.70</td>
<td>0.000</td>
</tr>
<tr>
<td>1st semester GPA</td>
<td>0.72***</td>
<td>0.01</td>
<td>0.80</td>
<td>118.36</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Notes: \( R^2 = .74 \)
LC = Learning community
* \( p < .05 \), ** \( p < .01 \), *** \( p < .001 \)
Total Credits Earned after the First Semester

A stepwise multiple linear regression was calculated to predict total credits earned after the first semester. The best fit model found included the following independent variables: learning community participation, age, Black students, Hispanic students, White students, Asian students, College of Business majors, College of Sciences majors, College of Urban Affairs majors, Undeclared majors, first semester GPA, residence, and high school GPA. A significant regression equation was found \((F(14, 7807) = 249.815, p < .000)\), with \(R^2 = .309\). About 31% of the variance in first semester credits earned was accounted for by the independent variables included in this regression. Table 7 provides the linear regression results for credits earned after the first semester.

Table 7:

Results of Linear Regression of Input and Environmental Variables on Credits Earned after First Semester

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>SE B</th>
<th>β</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-11.11***</td>
<td>2.00</td>
<td>-5.57</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>LC Participation Level</td>
<td>-2.57***</td>
<td>0.48</td>
<td>-0.07</td>
<td>-5.34</td>
<td>0.000</td>
</tr>
<tr>
<td>Age</td>
<td>0.12</td>
<td>0.10</td>
<td>0.01</td>
<td>1.20</td>
<td>0.230</td>
</tr>
<tr>
<td>Asian</td>
<td>-0.55</td>
<td>0.33</td>
<td>-0.02</td>
<td>-1.70</td>
<td>0.090</td>
</tr>
<tr>
<td>Black</td>
<td>-1.07**</td>
<td>0.40</td>
<td>-0.03</td>
<td>-2.68</td>
<td>0.007</td>
</tr>
<tr>
<td>Hispanic</td>
<td>-0.43</td>
<td>0.29</td>
<td>-0.02</td>
<td>-1.47</td>
<td>0.142</td>
</tr>
<tr>
<td>White</td>
<td>0.31</td>
<td>0.29</td>
<td>0.02</td>
<td>1.08</td>
<td>0.281</td>
</tr>
<tr>
<td>College of Business majors</td>
<td>0.84**</td>
<td>0.29</td>
<td>0.03</td>
<td>2.84</td>
<td>0.004</td>
</tr>
<tr>
<td>College of Sciences majors</td>
<td>1.13***</td>
<td>0.27</td>
<td>0.04</td>
<td>4.18</td>
<td>0.000</td>
</tr>
<tr>
<td>College of Urban Affairs majors</td>
<td>1.73**</td>
<td>0.50</td>
<td>0.05</td>
<td>3.45</td>
<td>0.001</td>
</tr>
<tr>
<td>Undecided majors</td>
<td>-1.43***</td>
<td>0.29</td>
<td>-0.05</td>
<td>-4.92</td>
<td>0.000</td>
</tr>
<tr>
<td>First semester GPA</td>
<td>3.20***</td>
<td>0.10</td>
<td>0.35</td>
<td>33.29</td>
<td>0.000</td>
</tr>
<tr>
<td>Residence</td>
<td>0.67**</td>
<td>0.21</td>
<td>0.03</td>
<td>3.13</td>
<td>0.002</td>
</tr>
<tr>
<td>High school GPA</td>
<td>4.41***</td>
<td>0.16</td>
<td>0.29</td>
<td>27.45</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Notes: \(R^2 = .31\)

LC = Learning community

* \(p < .05\), ** \(p < .01\), *** \(p < .001\)
Total Credits Earned after the Second Semester

A stepwise multiple linear regression was calculated to predict total credits earned after the second semester. The best fit model found included the following independent variables: learning community participation, age, gender, Asian students, Black students, Hispanic students, White students, College of Business majors, College of Sciences majors, College of Urban Affairs majors, Undeclared majors, first semester GPA, first semester credits earned, second semester cumulative GPA, residence, and high school GPA. A significant regression equation was found (F(16, 7123) = 6095.761, p < .000), with $R^2 = .932$. About 93% of the variance in second semester credits earned was accounted for by the independent variables included in this regression. Table 8 provides the linear regression results for cumulative credits earned after the second semester.
Table 8:
Results of Linear Regression of Input and Environmental Variables on Cumulative Credits
Earned after Second Semester

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>SE B</th>
<th>β</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>6.71***</td>
<td>0.82</td>
<td>8.18</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>LC Participation Level</td>
<td>0.51**</td>
<td>0.19</td>
<td>0.01</td>
<td>2.63</td>
<td>0.009</td>
</tr>
<tr>
<td>Age</td>
<td>-0.32***</td>
<td>0.04</td>
<td>-0.02</td>
<td>-7.59</td>
<td>0.000</td>
</tr>
<tr>
<td>Gender</td>
<td>-0.03</td>
<td>0.07</td>
<td>0.00</td>
<td>-0.44</td>
<td>0.658</td>
</tr>
<tr>
<td>Asian</td>
<td>0.63***</td>
<td>0.13</td>
<td>0.02</td>
<td>4.85</td>
<td>0.000</td>
</tr>
<tr>
<td>Black</td>
<td>0.17</td>
<td>0.16</td>
<td>0.00</td>
<td>1.04</td>
<td>0.299</td>
</tr>
<tr>
<td>Hispanic</td>
<td>0.25*</td>
<td>0.12</td>
<td>0.01</td>
<td>2.10</td>
<td>0.036</td>
</tr>
<tr>
<td>White</td>
<td>0.28*</td>
<td>0.12</td>
<td>0.01</td>
<td>2.36</td>
<td>0.018</td>
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<tr>
<td>College of Business majors</td>
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<td>0.879</td>
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<td>College of Sciences majors</td>
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<td>0.11</td>
<td>0.00</td>
<td>0.97</td>
<td>0.330</td>
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<tr>
<td>College of Urban Affairs majors</td>
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<td>0.00</td>
<td>0.19</td>
<td>0.848</td>
</tr>
<tr>
<td>Undeclared majors</td>
<td>-0.45***</td>
<td>0.12</td>
<td>-0.01</td>
<td>-3.85</td>
<td>0.000</td>
</tr>
<tr>
<td>First semester GPA</td>
<td>-1.23***</td>
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<td>-0.10</td>
<td>-16.79</td>
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<tr>
<td>First semester cumulative credits</td>
<td>1.01***</td>
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<td>Second semester GPA</td>
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<td>57.99</td>
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</tr>
<tr>
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<td>0.09</td>
<td>0.03</td>
<td>8.04</td>
<td>0.000</td>
</tr>
<tr>
<td>High school GPA</td>
<td>0.15*</td>
<td>0.07</td>
<td>0.01</td>
<td>2.11</td>
<td>0.035</td>
</tr>
</tbody>
</table>

Notes: $R^2 = .93$
LC = Learning community
* $p < .05$, ** $p < .01$, ***$p < .001$
Logistic Regression

The fourth research question was: Which combination of demographic characteristics (age, ethnicity, gender), other entering characteristics (socioeconomic status, parents’ educational levels, high school GPA, standardized test scores), environmental characteristics (participation in a learning community, academic major, residence hall living), and outcomes (GPA after the first semester, cumulative GPA after the second semester, credits earned in the first semester, total credits earned after the second semester) best explain UNLV undergraduate students’ persistence to the second year of college?

Binary logistic regression was utilized to predict persistence to the second year of college. Blocks were created according to Astin’s I-E-O model such that Block 1 contained the demographic variables (Inputs), Block 2 contained the other entering characteristics (Inputs), Block 3 contained the environmental characteristic (Environment), and Block 4 contained the outcomes (Outcomes). Standardized test scores were excluded from the environmental characteristics due to the high number of missing data points. Initial regressions were run and non-significant variables were removed from the model. In the final model, variables were again entered into the logistic regression in four blocks. The results from each block are provided next and in Appendix Table A-3.
Block 1 – Inputs, Demographic

Block 1 contained the demographic variables age, gender, and Asian students. Based upon the results of a chi-square test, Block 1 was significant and $X^2 (3, N = 6424) = 69.27, p < .001$. Based on the Cox and Snell $R^2$ and the Nagelkerke $R^2$, between 1.1% and 1.7% of the variance in persistence to the second year of college was explained by this block. Exp(B) values in this block indicate that Asian students were twice as likely to persist to the second year of college, and female students were 1.22 times more likely to do so. Age did not have a significant impact. Table 9 presents the results of the demographic variables in block 1 of the logistic regression.

**Table 9:**

Results of Logistic Regression of Demographic Variables on Persistence to the Second Year of College

<table>
<thead>
<tr>
<th>Variables</th>
<th>Block 1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$B$</td>
</tr>
<tr>
<td>Age</td>
<td>-0.03</td>
</tr>
<tr>
<td>Asian</td>
<td>0.71***</td>
</tr>
<tr>
<td>Gender</td>
<td>0.20**</td>
</tr>
<tr>
<td>Constant</td>
<td>1.88</td>
</tr>
<tr>
<td>$X^2$</td>
<td></td>
</tr>
<tr>
<td>Percentage correct</td>
<td>81.4%</td>
</tr>
<tr>
<td>Cox and Snell $R^2$</td>
<td>.011</td>
</tr>
<tr>
<td>Nagelkerke $R^2$</td>
<td>.017</td>
</tr>
</tbody>
</table>

*Notes: ** $p < .01$, *** $p < .001$*
Block 2 – Inputs, Entering

Block 2 added the entering variables high school GPA and Parents’ AGI which was one component of socioeconomic status. The chi-square was again significant and $X^2 (5, N = 6424) = 334.98, p < .001$. According to the Cox and Snell $R^2$ and the Nagelkerke $R^2$, between 5% and 8% of the variance in persistence to the second year of college was explained by the variables in this block. Exp(B) values in this block indicate that Asian students were 1.7 times more likely to persist to the second year of college, and that for each one-point increase in high school GPA, students were 2.4 times more likely to persist to the second year of college. Parents’ AGI was significant but had little to no measurable impact on persistence. Age and gender were not significant in this block. Table 10 presents the results of the input variables in block 2 of the logistic regression.

Table 10:
Results of Logistic Regression of Input Variables on Persistence to the Second Year of College

<table>
<thead>
<tr>
<th>Variables</th>
<th>Block 1</th>
<th></th>
<th></th>
<th></th>
<th>Block 2</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$B$</td>
<td>SE</td>
<td>$\beta$</td>
<td>$p$</td>
<td>$B$</td>
<td>SE</td>
<td>$\beta$</td>
<td>$p$</td>
</tr>
<tr>
<td>Age</td>
<td>-0.03</td>
<td>0.04</td>
<td>0.97</td>
<td>0.389</td>
<td>0.01</td>
<td>0.04</td>
<td>1.01</td>
<td>0.800</td>
</tr>
<tr>
<td>Asian</td>
<td>0.71***</td>
<td>0.10</td>
<td>2.03</td>
<td>0.000</td>
<td>0.53***</td>
<td>0.10</td>
<td>1.70</td>
<td>0.000</td>
</tr>
<tr>
<td>Gender</td>
<td>0.20**</td>
<td>0.07</td>
<td>1.22</td>
<td>0.002</td>
<td>0.06</td>
<td>0.07</td>
<td>1.06</td>
<td>0.388</td>
</tr>
<tr>
<td>Parents’ AGI</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.00**</td>
<td>0.00</td>
<td>1.00</td>
<td>0.001</td>
</tr>
<tr>
<td>High school GPA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.86***</td>
<td>0.06</td>
<td>2.37</td>
<td>0.000</td>
</tr>
<tr>
<td>Constant</td>
<td>1.88</td>
<td>0.73</td>
<td>6.54</td>
<td>0.010</td>
<td>-1.84</td>
<td>0.77</td>
<td>0.16</td>
<td>0.017</td>
</tr>
</tbody>
</table>

$X^2$ 69.27 334.98
Percentage correct 81.4% 81.4%
Cox and Snell $R^2$ .011 .051
Nagelkerke $R^2$ .017 .082

Notes: ** $p < .01$, *** $p < .001$
Block 3 - Environment

Block 3 added the environmental variables learning community participation, residence hall living, and seven academic colleges – College of Fine Arts, College of Hotel Administration, Nursing, College of Sciences, College of Urban Affairs, College of Business, and College of Engineering. The chi-square was again significant and $X^2 (14, N = 6424) = 366.81$, $p < .001$. In this block, the range of the variance in persistence to the second year of college explained by the variables included was 5.5% to 9%, based upon the Cox and Snell $R^2$ and the Nagelkerke $R^2$. Exp(B) values in this block replicated the findings from Block 2 regarding all input variables’ significance and levels. Additional significant findings regarding environmental characteristics pertained to students enrolled in the College of Fine Arts who were 1.7 times more likely to persist to the second year of college and students enrolled in the School of Nursing who were .78 times less likely to persist to the second year. The other environmental characteristics including learning community participation, residence hall living, and the other colleges entered into this block did not demonstrate a significant impact on persistence to the second year of college. Table 11 presents the results of the input and environmental variables in block 3 of the logistic regression.
Table 11:
Results of Logistic Regression of Input and Environmental Variables on Persistence to the Second Year of College

<table>
<thead>
<tr>
<th>Variables</th>
<th>Block 1</th>
<th>Block 2</th>
<th>Block 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE</td>
<td>β</td>
</tr>
<tr>
<td>Age</td>
<td>-0.03</td>
<td>0.04</td>
<td>0.97</td>
</tr>
<tr>
<td>Asian</td>
<td>0.71***</td>
<td>0.10</td>
<td>2.03</td>
</tr>
<tr>
<td>Gender</td>
<td>0.20**</td>
<td>0.07</td>
<td>1.22</td>
</tr>
<tr>
<td>Parents’ AGI</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High school GPA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LC Participation Level</td>
<td>-0.01</td>
<td>0.17</td>
<td>0.99</td>
</tr>
<tr>
<td>College of Engineering</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>College of Fine Arts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>College of Hotel Admin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>College of Sciences</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>College of Urban Affairs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>College of Business</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>School of Nursing majors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residence</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>1.88</td>
<td>0.73</td>
<td>6.54</td>
</tr>
</tbody>
</table>

Χ² | 69.27 | 334.98 | 366.81 |
Percentage correct | 81.4% | 81.4% | 81.3% |
Cox and Snell R² | .011 | .051 | .055 |
Nagelkerke R² | .017 | .082 | .090 |

Notes: LC = Learning community
* p < .05, ** p < .01, *** p < .001
Block 4 – Outcomes

Block 4 added the outcome variables first semester credits earned, second semester GPA, and second semester cumulative credits and resulted in what is referred to as the full model. A test of the full model against a constant only model was significant, indicating that the variables selected reliably distinguished between students who persisted to the second year of college and those who did not. In the beginning block (Block 0) 81.8% of cases were predicted correctly. Only Block 4 showed a change with 87.6% of cases predicted correctly. Prediction success was much greater for students who persisted to the second year of college (97.3%) than those who did not (44.9%). To determine the significance of the model a chi square test was run and $X^2 (16, N = 6424) = 1825.90, p < .001$. Based on the Cox and Snell $R^2$ and the Nagelkerke $R^2$, between 25% and 40% of the variance in persistence to the second year of college is explained by this model. Hosmer-Lemeshow goodness of fit test was not significant $X^2 (8, N = 6424) = 46.24, p > .05$. A p-value < .05 indicates a model that is not a good fit. Exp(B) values indicate that:

- for each year older, students were 0.87 times less likely to persist to the second year of college
- Asian students were 1.49 times more likely to persist to the second year of college
- for each 1.0-point increase in high school GPA, students were 0.75 times less likely to persist to the second year of college
- students who lived on campus were 0.64 times less likely to persist to the second year than commuters
- for each 1.0-point increase in second semester college GPA, students were 4.4 times more likely to persist to the second year of college
for each additional credit earned by the end of the second semester of college, students were 1.04 times more likely to persist to the second year of college.

Summary

The purpose of this chapter was to present the descriptive statistics and the results of the significant correlations, linear regressions, and logistic regressions that correspond to each of the research questions. The findings reported in this chapter raise important topics for discussion that are explored in the next chapter.
Chapter 5 - Discussion

Student retention is a critical challenge facing institutions of higher education. It is a financial issue for institutions who invest in recruitment and receive performance-based funding tied to course completion and graduation rates. It is also a financial issue for students and their families who are paying increasing tuition rates and taking out more student loans. In addition, retention is a societal issue evidenced by the fact that less than 60% of students who began a degree at a four-year institution in fall 2009 graduated within six years (NCES, 2017). Identifying ways to help more students graduate has individual, institutional, and societal benefits.

First-year college students often feel overwhelmed with the combination of new stressors that university life and adulthood place upon them (Pancer, et. al., 2000). Many have a series of disconnected experiences in the classroom and have trouble making meaning of and finding value in their courses when they do not see how they connect to one another and can be applied to the world around them (Tinto, 2003). Learning communities are a construct in higher education that has gained popularity over the past few decades. Learning communities are defined as the same group of students taking two or more classes together. Furthermore, these communities integrate coursework and personal connections among students and faculty to facilitate an environment of learning and personal growth (Brower & Dettering, 1998).

Research on learning communities is limited, given their prevalence in higher education, and few of these studies include important factors such as socioeconomic status and parental education levels. The primary goal of this study is to examine the influence of participation in a learning community on undergraduate students’ early success at a public, research-intensive, urban commuter university. Using Astin’s Input-Environment-Outcome (I-E-O) conceptual
model as a framework, this quantitative study used secondary data representing approximately 11,000 students to investigate the relationship between environmental characteristics, including learning communities, and outcome characteristics that are indicators of early student success (i.e., total credits earned and cumulative grade point average after the first and second semesters of college, and persistence to the second year) while controlling for demographic and entering characteristics.

The population used for this study consisted of 10,972 first-year undergraduate students from all majors who matriculated to the university in fall 2013, fall 2014, and fall 2015. Of those, 822 students participated in learning communities offered by the College of Business and the College of Urban Affairs.

The variables examined were categorized as input, environmental, or outcome. Input variables were further categorized as demographic and entering. Demographic variables were age, gender, and ethnicity. Entering characteristics were socioeconomic status, parental education levels, high school GPA, and standardized test scores (ACT and SAT). Environmental variables were participation in a learning community, academic major, and residence. Outcome variables were cumulative GPA after the first and second semesters, cumulative credits earned after the first and second semesters, and persistence to the second year.

**Discussion of Results**

The study addresses four research questions related to learning communities and early student success.

**Research question #1.** *What are the demographic characteristics (age, gender, ethnicity), entering characteristics (socioeconomic status, parents’ educational levels, high school GPA, standardized test scores), and other environmental characteristics (academic...*
major, residence hall living) of students who participated in learning communities and those who did not?

Overall, the first research question demonstrated how learning community participants differed from the rest of the population. Statistically, learning community participants were younger, more likely to be Black or Hispanic, and less likely to be non-resident alien or Asian. They had lower high school GPAs and lower standardized test scores. Students who participated in learning communities were less likely to report that their parents had bachelor’s degrees or higher and more likely to report that their parents’ highest degrees earned were high school diploma or equivalent.

Previous research suggests that Black and Hispanic students are less likely to persist to the second year of college than White and Asian students (Braxton, Duster, & Pascarella, 1988; Buddin, 2012; DeNicco, Harrington, & Fogg, 2015; Lewallen, 1993; Witkow et al., 2015). Students with lower high school GPAs and lower standardized test scores are also less likely to persist (DuBrock, 1999; Fleming, 2002; Kim, 2002; Ishitani & DesJardins, 2002; Moffat, 1993; Ramist, Lewis, & McCamley-Jenkins, 1994; Tross et al., 2000; Wolfe & Johnson, 1995; Zheng et al., 2002; Westrick et al., 2015). First-generation college students are less likely to persist to the second year of college (Choy, 2001; Ishitani, 2003, 2006; Lohfink & Paulsen, 2005). In this study, learning community participants shared demographic and entering characteristics of the groups that previous research has shown to be less likely to persist, however, there was no difference in their persistence rates when compared to the rest of the population.

While this study did not find higher persistence rates for learning community participants, the fact that persistent rates for this population were not lower than average may indicate a positive influence. The connections formed among students enrolled in multiple
classes together may provide support that positively impacts retention to allow populations that are typically less likely than average to return for the second year of college to continue their education.

**Research question #2.** Are demographic characteristics (age, ethnicity, gender), entering characteristics (socioeconomic status, parents’ educational levels, high school GPA, standardized test scores), or environmental characteristics (participation in a learning community, academic major, residence hall living) related to cumulative GPA after the first or second semesters or total credits earned after the first or second semesters?

The independent variable with the highest correlation to the four dependent variables in this research question was high school GPA. High school GPA yielded moderately positive correlations with first and second semester GPA and first and second semester credits earned. This is consistent with previous research that found high school performance to be the strongest predictor of college success (Astin & Oseguera, 2005; Camara and Echternacht, 2000; Fleming, 2002; Geiser & Santelices, 2007; Hoffman, 2002; Munro, 1981; Zheng et al., 2002).

Small and moderately positive correlations were found among all four types of standardized test scores (SAT Math, SAT Verbal, ACT Math, ACT English) and all four dependent variables (cumulative GPA after the first and second semesters and total credits earned after the first and second semesters). This is consistent with previous research that found test scores were related to credits earned (Wilson, 1980), first-year college GPA (Camara & Echternacht, 2000), and persistence (Camara & Echternacht, 2000; Stewart, Lim, & Kim, 2015; Wilson, 1980).

Small positive correlations were found between female students and both first and second semester GPA. Previous research on gender and college GPA is mixed, and this finding is
consistent with research by Wolfe (1993). Small positive correlations were also found between Asian students and both first and second semester GPA. Small negative correlations were found between Black students and both first and second semester GPA as well as total credits earned after the first and second semesters. Similar data were reported in national statistics (NCES, 2016) and have been found in other research (Buddin, 2012; D’Amico et al., 2014; Hagedorn, Maxwell, & Hampton, 2001; Witkow et al., 2015). Small positive correlations were found between parents’ Adjusted Gross Income (AGI) and second semester credits earned. Small negative correlations were found between financial need and second semester GPA as well as first and second semester cumulative credits earned. This is consistent with other research on socioeconomic status (SES) that found students from low SES families less likely to persist to the second year of college and less likely to graduate (Carroll, 1989; U.S. General Accounting Office Report, 1995; Adelman, 1999; Terenzini, Cabrera, & Bernal, 2001; Morgaman et al., 2002; Ishitani & DesJardins, 2002; Ishitani, 2003; Engle & Tinto, 2008; Bowen, Chingos, & McPerson, 2009; Cabrera, Burkum, La Nasa, & Bibo, 2012; Davidson & Petrosko, 2015; Witkow, Huynh, & Fuligni, 2015).

The positive correlations between high school GPA and first and second semester GPA and between high school GPA and first and second semester cumulative credits earned demonstrate that administrators can identify students who may need additional academic and social support, such as those provided through learning communities, prior to college matriculation. Students can be identified by a combination of their high school GPAs and standardized test scores and then enrolled in learning communities. If learning communities can provide additional support to help these students perform at the same level as the rest of the
population, this could yield overall increases and improvements in first-year college GPAs and credits earned.

**Research question #3.** Which combination of demographic characteristics (age, ethnicity, gender), entering characteristics (socioeconomic status, parents’ educational levels, high school GPA, standardized test scores), and environmental characteristics (participation in a learning community, academic major, residence hall living) best explain undergraduate students’ cumulative grade point averages after the first and second semesters and total credits earned after the first and second semesters?

Each outcome/dependent variable will be examined individually. Variables are listed in approximate order of importance of their impact on the dependent variables. Standardized $\beta$s are all positive unless otherwise indicated.

**Cumulative GPA after first semester.** GPA after the first semester is best explained by number of first semester credits earned, high school GPA, College of Fine Arts majors, undeclared majors, College of Hotel Administration majors, College of Nursing majors, College of Liberal Arts major, College of Business majors, College of Urban Affairs majors, College of Education majors, College of Engineering majors, parents’ AGI, Allied Health Sciences majors, and age. These variables as well as learning community participation and College of Health Sciences majors (which were also included in the best fit model but did not yield significant results) accounted for 31% of the variance in first semester GPA. This indicates that number of credits earned plays a small role in the first semester GPA, as do high school GPA, some academic majors and parental income.

**Cumulative GPA after second semester.** Cumulative GPA after the second semester is best explained by first semester GPA, high school GPA, and residence. These variable as well as
gender, Black students, Hispanic students, and Allied Health Sciences majors (which were also included in the best fit model but did not yield significant results) accounted for 74% of the variance in second semester cumulative GPA. This reinforces the notion that past academic performance in both high school and college is the best predictor of future academic performance, with the most recent (college) possessing a stronger predictive capability. It also supports the findings of Pascarella and Terenzini (2005) and others on the positive impacts of on-campus residence in studies that do not include social integration measures (Bozick, 2007; Gross et al., 2013; Herzog, 2005; Jaeger & Eagan, 2011; Jamelske, 2009; Johnson, 2008; Jones-White, Radcliffe, Huesman, & Kellogg, 2010; Paulsen & St. John, 2002; Somers et al., 2004).

**Credits earned after first semester.** First semester credits earned are best explained by the following variables: first semester GPA, high school GPA, learning community participation level (negative), undeclared majors (negative), College of Urban Affairs majors, College of Sciences majors, College of Business majors, residence, and Black students (negative). These variables as well as age, Asian, Hispanic, and White (which were also included in the best fit model but did not yield significant results) accounted for 31% of the variance in first semester credits earned. The effect of first semester GPA and high school GPA were considerably stronger than any of the other variables demonstrating that current and past academic performance have the strongest influence on credits earned.

Similar to first semester GPA, the variance indicates that it is likely that there are variables that were not included in this study that had an effect on credits earned in the first semester. Those variables may include additional incoming characteristics such as placement into developmental courses and environmental characteristics such as involvement in student groups and employment. Developmental courses are not credit-bearing at the institution studied.
Therefore, if students enrolled in learning communities (or undeclared majors or Black students) were more likely to enroll in developmental courses, they would also earn fewer credits at the end of the first semester. Enrollment in developmental courses was a variable that was not included in this research and has been included in recommendations for future research.

Involvement in registered student organizations (RSOs), including Greek letter organizations and collegiate athletics may also have had an effect on credits earned but were not included as variables in this study. Previous research has linked membership in Greek letter organizations (Pascarella & Terenzini, 2005; Walker, Martin, & Hussey, 2014) and participation in athletics (Wohlgemuth et al., 2007) with higher persistence rates. No research was found that demonstrated an effect of those types of involvement on credits earned. Data regarding involvement in RSOs were not available from the data sources used for this research and these variables have been included in recommendations for future research.

Since learning communities had a negative effect on credits earned after the first semester and a positive effect on first semester GPA, it is possible that for these students, those who had a lighter academic load were able to better focus on their courses and allocate their time to fewer credits with more academic success. That hypothesis did not bear out for the rest of the population because when all students were included, first semester credits earned had a positive effect on first semester GPA. Another explanation involves other variables that were not included in this research: employment and number of hours worked per week. Crisp and Nora (2010) found that the amount of time at work negatively influenced the likelihood of student success. These variables have also been included in the section for recommendations for future research.
Cumulative credits earned after second semester. Cumulative credits earned after the second semester are best explained by the following variables: first semester credits earned, second semester GPA, first semester GPA (negative), residence, Asian, age (negative), learning community participation level, Hispanic, White, high school GPA, and undeclared majors (negative). These variables as well as gender, Black, College of Business majors, College of Sciences majors, and College of Urban Affairs majors (which were also included in the best fit model but did not yield significant results) accounted for 93% of the variance in cumulative credits earned after the second semester. This is a highly predictive model which indicates that the model is an exceptional fit and the proper variables were selected for inclusion. There is an unexplained shift in the direction of influence of first semester GPA on credits earned from first to second semester. It is possible that a weaker first semester was a wake-up call to students that motivated them and positively influenced their second semester GPA and credits earned. There is also a change in direction of the influence of learning community participation when compared to its influence on credits earned after the first semester. One possible explanation is that the benefits of participation in a learning community are not immediate. Learning communities may require students to invest more time, negatively influencing students’ earned credits during the first semester but leave participants with a longer-term positive outcome.

The effect of high school GPA, while significant, is considerably smaller than after the first semester. After the first semester of college, the influence of high school GPA decreases and college factors become more predictive. This can be an important message to send to high school students to both inspire dedication to high school academics due to the influence that could have on first semester grades, and also to demonstrate that those who have not been high performers can turn things around in college.
Research question #4. Which combination of demographic characteristics (age, ethnicity, gender), entering characteristics (socioeconomic status, parents’ educational levels, high school GPA, standardized test scores), environmental characteristics (participation in a learning community, academic major, residence hall living), and outcomes (cumulative GPA after the first or second semesters or total credits earned after the first or second semesters) best explain undergraduate students’ persistence to the second year of college?

The variables were entered into a logistic regression in blocks, consistent with Astin’s I-E-O model and the subcategories of characteristics outlined within the research question. The final block, Block 4, explained the highest percentage of variance, between 25% and 40%, based on the Cox and Snell $R^2$ and the Nagelkerke $R^2$. This means that the variables selected account for somewhere between a quarter and two-fifths of the prediction of whether a student persists to the second year of college. Some variables provided stronger predictive value than others, and those are determined by odds ratios and are summarized below.

Second semester GPA. Odds ratios indicated that for each 1.0-point increase in second semester college GPA, students were 4.4 times more likely to persist to the second year of college. Some of this is accounted for by the fact that students at this institution with GPAs below 2.0 are placed on university probation. This is essentially a warning and some students choose to take time off and not continue at the university the following year. In addition, other students are placed on university probation after their first semester and continued poor academic performance in the second semester may result in university suspension. Those students are not permitted to return to the university the following academic year.

Asian students. Odds ratios from the logistic regression indicted that Asian students were 1.49 times more likely to persist to the second year of college. An emphasis on education
and family support provided to young adults to pursue and complete higher education is prevalent in Asian cultures. Higher persistence and graduation rates for Asian students have been documented in previous research (Buddin, 2012; Keels, 2013; NCES, 2016; Witkow et al., 2015).

**Second semester cumulative credits earned.** Odds ratios also indicated that for each additional credit earned by the end of the second semester of college, students were 1.04 times more likely to persist to the second year of college. This is a small effect and makes sense because students who began in developmental classes, dropped, or failed a class have fewer earned credits. The university limits freshmen to 17 credits per semester so it is more difficult for students to overload themselves with credits to the point that it could be detrimental to their success. Other universities charge a flat rate for full-time student enrollment regardless of the number of credits which encourages students to enroll in more, and possibly too many, credits. The university selected for this research charges students per credit and so the financial incentive to take more credits does not exist.

**Age.** Odds ratios indicated that for each year older, students were 0.87 times less likely to persist to the second year of college. Previous research does not indicate a difference in persistence rates by age for students under 25. There is some research that categorizes students as traditional (under 25) and non-traditional (25 and older) (Coates, 2014; Davidson & Petrosko, 2015; Markle, 2015). That research indicates that non-traditional students are less likely to persist and graduate. Since the population in this study was not grouped by age it is possible that there is a small but significant group of older students who are skewing the persistence rate. Approximately 10% of the population studied started college at age 19 or older. Most of these students do not meet the definition of non-traditional but they are older than the average student.
That may influence their university experience and/or correlate with greater responsibilities outside of college which may in turn affect persistence.

**High school GPA.** Odds ratios indicated that for each 1.0-point increase in high school GPA, students were 0.75 times less likely to persist to the second year of college. This was an unexpected finding. High school GPA had a positive effect on the other four dependent variables examined in the third research question. This indicates discordance when comparing high school GPA and persistence to high school GPA and college GPA or credits earned. There was a decreasing influence of high school GPA on the other dependent variables over time that indicted that its significance wanes throughout college. This observation is consistent with previous research (Kuh et al., 2008; Wohlgemuth et al., 2007) which offers a possible explanation: high-achieving students such as those enrolled in an honors program may be more likely to transfer to another institution due to dissatisfaction with their academic majors or programs. High-achieving and/or honors students were not grouped together in this research so their transfer rates were not available.

**Residence.** Odds ratios indicated that students who lived on campus were 0.64 times less likely to persist to the second year of college than commuters. While this finding is contrary to national research (Oseguera & Rhee, 2009; Schudde, 2011), it is consistent with other research that indicates that commuters at this institution behave differently than observed elsewhere (Gianoutsos, 2011; Gianoutsos & Rosser, 2014).

**Implications for Theory**

When examining college outcomes, there are a variety of characteristics that effect students at different points in time and have an influence on consequences such as persistence or completion. Astin’s Input-Environment-Outcome (I-E-O) model was originally developed to
guide college researchers though the design process of their research (Astin, 2012). It has subsequently been applied to many forms of college assessment. The framework compels scholars and practitioners to consider the influence of pre-college factors instead of jumping directly to the end results and attributing them to the environment. “The basic purpose of the I-E-O design is to allow us to measure relevant input characteristics of each student and then correct or adjust for the effects of these input differences in order to get a less biased estimate of the comparative effects of different environments on outputs” (Astin, 2012, p. 29).

According to Astin (2012) “inputs refers to those personal qualities the student brings initially to the educational program (including the student’s initial level of developed talent at the time of entry)” (p. 28). In other research, inputs may include the results of pre-tests and self-predictions. For this research inputs were divided into two categories: demographics and entering characteristics. Demographic characteristics included were age, gender, and ethnicity. Entering characteristics included were socioeconomic status, parents’ educational levels, high school GPA, and standardized test scores (SAT and ACT).

“The environment refers to the student’s actual experiences during the educational program” (Astin, 2012, p. 28). Environments can include a wide variety of factors including courses, professors, roommates, and physical surroundings. For this research, environmental characteristics examined were learning community participation, academic major, and residence.

Outcomes are “the ‘talents’ we are trying to develop in our educational program,” (Astin, 2012, p. 28). Examples of college outcomes include knowledge, college completion, and satisfaction. For this research, outcomes were first and second semester cumulative GPA, first and second semester cumulative credits earned, and persistence to the second year. See Table 2 for a complete list of variables (duplicated from Chapter 3).
Table 2: Variables

<table>
<thead>
<tr>
<th>Types of characteristics</th>
<th>Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input</td>
<td>Demographic</td>
</tr>
<tr>
<td></td>
<td>Age</td>
</tr>
<tr>
<td></td>
<td>Gender</td>
</tr>
<tr>
<td></td>
<td>Ethnicity</td>
</tr>
<tr>
<td></td>
<td>Entering</td>
</tr>
<tr>
<td></td>
<td>Socioeconomic status</td>
</tr>
<tr>
<td></td>
<td>Parents’ education levels</td>
</tr>
<tr>
<td></td>
<td>High school GPA</td>
</tr>
<tr>
<td></td>
<td>Standardized test scores</td>
</tr>
<tr>
<td>Environment</td>
<td>Participation in learning community</td>
</tr>
<tr>
<td></td>
<td>Academic major</td>
</tr>
<tr>
<td></td>
<td>Residence hall living</td>
</tr>
<tr>
<td>Outcome</td>
<td>First semester GPA</td>
</tr>
<tr>
<td></td>
<td>Cumulative GPA after second semester</td>
</tr>
<tr>
<td></td>
<td>Persistence to second year</td>
</tr>
<tr>
<td></td>
<td>Total credits earned in the first semester</td>
</tr>
<tr>
<td></td>
<td>Total credits earned after the second semester</td>
</tr>
</tbody>
</table>

Note: Table is duplicated from Chapter 3.

Astin’s I-E-O model provided a valuable theoretical framework for this research. It inspired the selection and grouping of variables and contributed to the structure and organization of each research question. The I-E-O model provided logical and practical groupings for the blocks that were used when running the logistic regression for the fourth research question which sought to identify the variables that best explain undergraduate students’ persistence to the second year of college. As a result, the variables were grouped into four blocks. Two of the blocks were inputs (demographic and other entering characteristics), one was environmental influences, and one was outcomes.

In this research, solely examining the outcomes of learning community participants without consideration of the inputs and other environmental characteristics would have provided an incomplete picture. It is because of the experimental design that this research was able to uncover the fact that learning community participants at this institution disproportionately
represented populations that are historically less likely to achieve early academic success. The I-E-O model also provided a framework to identify characteristics (high school GPA and standardized test scores) that are important identifiers of students who may benefit most from learning community participation. Without the holistic perspective of the I-E-O framework, valuable conclusions found through this research would have been missed.

**Implications for Practitioners**

Findings from this research can inform practitioners who currently work with or are considering the implementation of learning communities. There are also insights that can be gained from the other variables included in this research. First, Astin’s Inputs-Environment-Outcomes (I-E-O) model (2012) should be considered when assessing learning communities and other student success initiatives. Input characteristics can be obtained from institutional databases and contribute to a more complete picture when assessing the influence of educational programs on both academic and non-academic outcomes.

Many institutions offer learning communities for a portion of their students because full implementation across all populations is logistically challenging. This research demonstrates the benefits of learning community participation for students who are from populations that historically have lower persistence rates. These students can benefit from the curricular connections in their courses and the sense of community fostered among students and faculty. Academically high-achieving students can also benefit from a stronger sense of community and connection to their academic environment and are also prime candidates for learning community participation.

There are important messages for university personnel, including recruiters, who interact with high school students while they are considering their options for college. High school
academic performance and standardized test scores matter. They are indicators of students who will earn higher GPAs and more credits in the first year of college. It is unclear whether it is the knowledge gained, the study skills honed, and/or other consequences of pre-college achievement that influence early academic success in college. There is also a silver lining for the high school senior who has struggled academically and not tested well. College can provide a fresh start. The first semester will have important implications for the second semester, and so on. With a renewed level of academic commitment and the appropriate support, college students can quickly minimize the effects of a weak high school transcript with proper study habits and sufficient time committed to academics.

Chapter 2 provided an overview of the types and models of learning communities. There is extensive variation across and within types. One key factor is the degree of curricular integration across courses. This requires coordination and communication among faculty prior to and during the semester of implementation. The learning communities examined in this research likely utilized minimal curricular integration. Incentives and guidance were not provided at an institutional-level. As a result, these learning communities likely did not have as strong of an effect as they would have if there was more communication among the faculty and more reinforcement across the curriculum. To improve the level of institutional support for learning community faculty, instructors should be provided with research on successful learning community models, recommendations for implementation, and structure for collaborating with other faculty who teach the same students. Similarly, students can be provided with specific suggestions for how to make the most of the advantages they are provided by participation in a learning community.
Practitioners are encouraged to note the possibility of delayed effects from a learning community experience. Especially when learning communities include a first-year seminar as in this research, students will be learning study skills, time management, and other college success strategies that take time to digest and apply. Positive effects are typically seen in subsequent semesters.

**Limitations**

There are limitations to this research that will be overviewed in this section. First, this research is based upon data from a single institution and is not generalizable to other institutions. Second, there are variables that were identified that were not included in this study. Those include enrollment in developmental courses, student involvement including participation in Greek life and athletics, number of hours of student employment on- or off-campus, and intent to return for the second year of college. With the exception of enrollment in developmental courses, the variables listed were not available to the researcher. Third, the learning communities examined were housed in two different academic colleges and were structured differently. One college offered linked courses and included two classes each while the other offered learning clusters and included three classes each. One college enrolled a subset of their population (about 20%) into learning communities while the other college enrolled all of their students into learning communities. Nevertheless, all learning community participants were combined into a binary variable (Yes/No) for this research. Finally, enrollment into learning communities was not random. It was determined by academic advisors and was highly dependent upon the college of enrollment, the timing of the student’s orientation, and availability of classes. Some of these limitations can be addressed in future research which will be proposed in the next section.
Future Research

College completion and, as a result, the intermediary step of persistence will continue to be of paramount importance on the national, state, institutional, and individual levels. Consequently, additional research on learning communities and other factors that bear significant consequences on persistence and completion will be proposed.

Future research with a dataset similar to the one used for this study should implement statistical matching. After completing a power analysis, the appropriate number of non-learning community participants should be matched with each learning community participant. This will minimize most of the Type I error found with a dataset this size.

While this study included a broad selection of variables at both the input and environmental levels, there are additional variables that should be considered in future research. One variable that was not included that may have a significant effect on early student success, most notably credits earned, is enrollment in developmental courses. Because developmental courses are not credit-bearing, they most certainly have a negative effect on credits earned. While for some students, placement into developmental courses is determined by standardized test scores, there are other ways to place into or out of developmental courses such as institutional placement exams and self-selection. Therefore, the inclusion of students enrolled in developmental courses as a separate variable is warranted.

College students’ experiences are likely influenced by the campus activities and other choices they make regarding how they spend their time. Some activities such as athletics and Greek life involve relationship-building with other students and staff at the university. Other choices such as employment (on- or off-campus) and the number of hours students work per week also influence students’ experiences and likely their academic success. These may be
complex, nonlinear interactions because campus connections and relationships can support student success while over-commitment and involvement can have a detrimental effect. It is unclear how these additional environmental characteristics influence early student success and therefore the inclusion of such variables in future research is recommended.

Students from the two academic colleges that offer learning communities at this institution were combined into one dataset and marked as learning community participants. Future research with this same dataset can parse out College of Business learning community participants and College of Urban Affairs learning community participants. This would allow the researcher to determine whether there were different effects based on the home college of the learning communities. Future research could look at students who were co-enrolled in two classes together and those who were co-enrolled in three classes together. It is not clear if the third class within the learning community has a strengthening effect and future research is recommended to determine that influence.

There are rich opportunities both utilizing the existing dataset and broadening the scope of this research to expand upon the findings from this study. In addition, qualitative research and mixed methods studies could explore aspects of the mechanisms of learning communities such as how and why they affect early student success. Finally, interactions within a learning community are complex and case studies based upon the experiences of learning community students in and out of the classroom could inform researchers’ and practitioners’ understanding of the real-life contextual conditions.
Conclusion

Learning communities and their participants have been understudied given their increasing prevalence in higher education over the past three decades. It is important to gain a better understanding of the influence of learning communities on early student success.

Using Astin’s Input-Environment-Outcome conceptual model as a framework, this quantitative study used secondary data representing approximately 11,000 students to investigate the relationship between environmental characteristics, including participation in learning communities, and outcome characteristics that are indicators of early student success (i.e. total credits earned and cumulative grade point average after the first and second semesters of college, and persistence to the second year) while controlling for demographic and entering characteristics.

The key findings of this study included the fact that learning community participation supported students who were from populations that historically have lower persistence rates to return to college for their second year at the same rate as their peers. In addition, first semester college GPA and credits earned were highly correlated, and high school GPA was a strong predictor of both. By the second semester of college, cumulative GPA and credits earned were still highly correlated, but the first semester of college was more predictive than high school. These findings have important implications for which and how students are selected to participate in learning communities. They also provide insight into which academic factors influence first-year students at different points in time during their academic journey. There is valuable future research that can continue to shed light on the varied and complex factors that affect early academic success.
### Appendix

**Table A-1**  
*Parents’ Educational Levels*  
*Fathers’ Education Levels*

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<th>LC</th>
<th>LC</th>
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<tr>
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<th>LC</th>
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<td>n</td>
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<td>Total</td>
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<td>10150</td>
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</table>
### Table A-2

**Significant Correlations**

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<th>Black</th>
<th>Parents' AGI</th>
<th>Fin Need</th>
<th>HS GPA</th>
<th>SAT Math</th>
<th>SAT Reading</th>
<th>ACT Math</th>
<th>ACT English</th>
<th>1st sem GPA</th>
<th>1st sem cum cr</th>
<th>2nd sem GPA</th>
<th>2nd sem cum cr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asian</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>.03**</td>
<td>-.13**</td>
<td></td>
<td></td>
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<td>-.01</td>
<td>-.08**</td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Fin Need</td>
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<td>-.03**</td>
<td>.18**</td>
<td>-.54**</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High school GPA</td>
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<td>-.12**</td>
<td>.06**</td>
<td>-.17**</td>
<td></td>
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</tr>
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<td>.14**</td>
<td>-.17**</td>
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<td>.45**</td>
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<td></td>
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</tr>
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<td>SAT Reading</td>
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<td>.37**</td>
<td>.58**</td>
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<td>.09**</td>
<td>-.09**</td>
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<td>.27**</td>
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</tr>
<tr>
<td>1st sem cum cr</td>
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<td>.08**</td>
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<td>.08**</td>
<td>-.10**</td>
<td>.45**</td>
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<td>.38**</td>
<td>.45**</td>
<td></td>
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<tr>
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<td>.11**</td>
<td>-.12**</td>
<td>.09**</td>
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<td>.37**</td>
<td>.42**</td>
<td>.41**</td>
<td>.53**</td>
<td>.92**</td>
<td>.59**</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:** sem = semester; cum cr = cumulative credits

Strength of correlation is interpreted as follows:

.01 - .09 = very low
.10 - .30 = low
.31 - .50 = moderate
.51 or higher = strong

*Correlation is significant at the 0.05 level (2-tailed).
**Correlation is significant at the 0.01 level (2-tailed).
### Table A-3

**Results of Logistic Regression of Input, Environment, and Outcome variables on Persistence to the Second Year of College**

<table>
<thead>
<tr>
<th>Variables</th>
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<th>Block 2</th>
<th>Block 3</th>
<th>Block 4</th>
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<td>B</td>
<td>SE</td>
<td>β</td>
<td>p</td>
</tr>
<tr>
<td>Age</td>
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<tr>
<td>Asian</td>
<td>0.71***</td>
<td>0.10</td>
<td>2.03</td>
<td>0.000</td>
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<tr>
<td>Gender</td>
<td>0.20**</td>
<td>0.07</td>
<td>1.22</td>
<td>0.002</td>
</tr>
<tr>
<td>Parents’ AGI</td>
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</tr>
<tr>
<td>High school GPA</td>
<td>0.86***</td>
<td>0.06</td>
<td>2.37</td>
<td>0.000</td>
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<tr>
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<td>0.51***</td>
<td>0.14</td>
<td>1.67</td>
<td>0.000</td>
</tr>
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<td>College of Hotel Admin</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>College of Sciences</td>
<td>0.05</td>
<td>0.11</td>
<td>1.06</td>
<td>0.624</td>
</tr>
<tr>
<td>College of Urban Affairs</td>
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</tr>
<tr>
<td>College of Business</td>
<td>0.13</td>
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</tr>
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</tr>
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<td>Residence</td>
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<tr>
<td>Second semester GPA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Second sem cum cr</td>
<td>0.04***</td>
<td>0.01</td>
<td>1.04</td>
<td>0.000</td>
</tr>
<tr>
<td>Constant</td>
<td>1.88</td>
<td>0.73</td>
<td>6.54</td>
<td>0.010</td>
</tr>
<tr>
<td>X²</td>
<td>69.27</td>
<td>334.98</td>
<td>366.81</td>
<td>1825.90</td>
</tr>
<tr>
<td>Percentage correct</td>
<td>81.4%</td>
<td>81.4%</td>
<td>81.3%</td>
<td>87.6%</td>
</tr>
<tr>
<td>Cox and Snell R²</td>
<td>.011</td>
<td>.051</td>
<td>.055</td>
<td>.247</td>
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<tr>
<td>Nagelkerk R²</td>
<td>.017</td>
<td>.082</td>
<td>.090</td>
<td>.401</td>
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**Notes:** LC = Learning community, sem = semester; cum cr = cumulative credits

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


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student success. *ASHE annual meeting paper.* Retrieved from


BETH MICHELLE GERSTEN
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EDUCATION
University of Nevada, Las Vegas, Las Vegas, NV
Ph.D. in Higher Education Leadership, August 2018
Dissertation: Learning Communities and Early Student Success

Bowling Green State University, Bowling Green, OH
Master of Arts in College Student Personnel, May 1999

Duke University, Durham, NC
Bachelor of Arts in Psychology, Certificate in Judaic Studies, May 1996

PROFESSIONAL EXPERIENCE
UNIVERSITY OF NEVADA, LAS VEGAS, Las Vegas, NV
Assistant Dean for Undergraduate Programs, Lee Business School
January 2012-present
- Provide oversight and leadership for the Offices of Undergraduate Advising and Career & Professional Development
- Contribute consistently to the Lee Business School dean’s leadership team and executive committee
- Supervise staff and operations for the Lee Business School first-year seminar program
- Coordinate and provide supervision for awarding approximately $500,000 of scholarship funds annually
- Supervise ten professional staff members and one administrative assistant
- Serve as final decision maker for academic appeals regarding business school academic exceptions
- Collaborate with campus partners such as Registrar, Veterans’ Affairs, and International Student Services
- Advise academic department chairs and college curriculum committee members on curriculum matters
- Employ data-based decision making to outreach to at-risk students and promote student success
- Coordinate recruitment efforts targeting prospective freshmen, transfer students, and families
- Launched student recognition programs and events for academic milestones and co-curricular excellence
- Coordinate academic learning communities to promote first-year students’ success

Professional Development Coordinator/Academic Advisor, Lee Business School
August 2010-December 2011
- Coordinated curriculum, faculty, and service projects for 22 sections of Lee Business School first-year seminars annually
- Managed new student orientation programs and processes for Lee Business School advising
- Provided individual and group advising, offering in-person, phone, drop-in and virtual options
- Referred students to appropriate campus resources based upon extensive training and knowledge of campus services

Graduate Assistant, Academic Success Center
May 2010-August 2010
- Planned training on topics such as study skills and time management for Academic Success Coaches

SUFFOLK UNIVERSITY, Boston, MA
Director of Orientation & New Student Programs (ONSP)
March 2009-March 2010
- Provided oversight and leadership for the Office of ONSP
- Supervised the Assistant Director, Operations Coordinator, and Graduate Fellow for ONSP
- Managed a budget of over $600,000 for orientation, first year seminar, family weekend, and sophomore programs
- Developed, implemented, and assessed 11 new student and transfer orientation programs annually
- Coordinated, implemented, and assessed 65 sections of a first-year seminar course each year
- Developed specialized sections for business students, under-prepared students, and those with academic difficulties
- Collaborated with faculty and deans to design learning communities with first-year seminar courses
- Oversaw curriculum development and review for all section types
- Recruited faculty and teaching assistants for all first-year seminar sections
- Coordinated, implemented and assessed all university-wide annual Welcome Programs and Family Weekend activities

Associate Director of New Student Programs
July 2005-March 2009
- Developed and implemented university-wide new student and family orientation programs as well as Family Weekends
- Co-chaired two University committees guiding and informing orientation programming and logistics
- Outreached as the primary contact to campus departments, including offices from all major university units
- Recruited, selected, trained, supervised and evaluated 34-member orientation staff
- Assisted in the development, publicity, and implementation of welcome programming and University Convocation
BUCKNELL UNIVERSITY, Lewisburg, PA  July 1999-June 2001

Residential Life Coordinator
- Supervised 45 undergraduate RAs and three graduate student Resident Managers (RMs) within 14 residential buildings, housing 750 students
- Counseled students regarding personal issues that were affecting their academic success and general well-being
- Assisted in the recruitment, selection, and training of the RAs and RMs
- Oversaw the community building, programming, budgets and policy enforcement efforts for half of campus
- Advised the Residence Hall Association (RHA) executive board and sub-committees for two residential areas
- Served as a crisis contact for campus emergencies

TEACHING EXPERIENCE
Instructor, BUS 103, first-year seminar course, UNLV, Las Vegas, NV  Spring 2011-present
- Teach three-credit course to Lee Business School students each semester
- Focus on developing a sense of belonging, academic competence, life skills, and career exploration

Instructor for SU101, first-year seminar course, Suffolk University, Boston, MA  Fall 2005-Fall 2009
- Taught one-credit course to College of Arts and Sciences first-year students each semester
- Focused on aiding students with their transition to college and creating connections to their community

Instructor for Introduction to University 100, Northeastern University, Boston, MA  Fall 2004
- Taught one-credit course to undecided College of Arts and Sciences first-year students
- Focused on connecting students to the University, major exploration, and academic and social adjustment

Instructor for University Success 100 Honors, Bowling Green State University, OH  Spring 1999
- Designed and taught two-credit honors course to first-year students
- Focused on healthy relationships, alcohol education, body image, eating disorders, and diversity

UNIVERSITY COMMITTEE INVOLVEMENT (selected)
Executive Director Leadership Team, UNLV academic advising, 2012-present
Lee Business School curriculum and assessment committees, UNLV, 2012-present
Top Tier Student Success committee, UNLV 2015
Student Success Collaborative implementation team and pilot college lead, 2014-2015
UNLV Retention, Progression, Completion project, 2014
Lee Business School strategic planning team, 2014
Student Affairs Divisional Assessment committee, Suffolk University 2008-2010
Orientation Planning Committee chair, Suffolk University, 2006-2010
First-Year Seminar Curriculum Review Committee chair, Suffolk University, 2006-2010

PROFESSIONAL AFFILIATIONS
National Association of Colleges and Employers, 2017-present
Association to Advance Collegiate Schools of Business, 2012-present
National Academic Advising Association, 2011-present
National Orientation Directors Association, 2001-2011
- Co-host of Annual Conference with over 900 attendees, 2008
- Co-chair for Programs Committee, Region IX Conference, 2006 & 2007
- Member of Publications Committee, Region IX Conference, 2005
- Chair of Consultants’ Program, Region IX Conferences, 2002 & 2004
- Co-Chair of Region IX Conference, 2003

PROFESSIONAL PRESENTATIONS (selected)
Interdisciplinary Learning Communities: Strategic Partnerships for High Impact Learning, NACADA Region IX, 2011
Developing a Comprehensive Marketing Plan for First-Year Experience Courses, NODA Annual, 2011
Making Orientation Fun! Using entertainment to convey information, NODA Region IX, 2007
Incorporating Service Opportunities in First-Year Programming, NODA Regional IX, 2007
Respect and Acceptance in a Multicultural Society (student-led diversity education), NODA Region IX, 2006