

DISSERTATION

SENSE OF PLACE AND STUDENT ENGAGEMENT AMONG UNDERGRADUATE  
STUDENTS AT A MAJOR PUBLIC RESEARCH UNIVERSITY

Submitted by

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## ABSTRACT

### SENSE OF PLACE AND STUDENT ENGAGEMENT AMONG UNDERGRADUATE STUDENTS AT A MAJOR PUBLIC RESEARCH UNIVERSITY

The purpose of this study was to explore the relationship between sense of place and student engagement among undergraduate students, in order to influence how higher education institutions view the role of the physical environment in fostering student engagement, learning, and personal development. Student engagement, a very important predictor of student learning, deals with the notion that when students and their institutions invest the time, effort, and resources in academically purposeful activities in college, the students become more engaged and learn more. Sense of place, an attitude to the physical environment, refers to the emotional bond that exists between individuals and a geographic or physical location.

There is suggestion in the literature that sense of place is related to student engagement but no empirical studies were found that linked the two constructs; and instrument for assessing student engagement do not contain items that are specifically designed to measure sense of place or students' attitudes to the physical environment of their college campuses.

Data for this quantitative study employing a non-experimental cross-sectional survey method were gathered with the National Survey of Student Engagement (NSSE) instrument modified to include sense of place and other items. Exploratory factor analysis was conducted on the 70 Likert-style items of the 85-item instrument ( $n = 358$ ) and yielded 13 factors with Cronbach's alpha ranging from 0.57 for *High Impact Practices* to 0.92 for *Sense of Place*. Cronbach's alpha for overall instrument was 0.93. A statistically significant correlation was found between sense of place and student engagement ( $r(413) = .43, p < .001$ ). Based on

simultaneous multiple regression analysis, the linear combination of variables: *sense of place*, *campus design*, *gender*, *racial/ethnic identity*, and *enrollment status* (full-time/part-time), predicted *student engagement*,  $F(5,346) = 24.88$ ,  $p < .001$  with all five variables significantly contributing to the prediction. The adjusted R squared value was .256 indicating that 25.6% of the variance in student engagement was explained by the model.



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Finally, I reserve my most profound gratitude to the Almighty God and to my Lord and Savior, Jesus Christ, for making everything possible.

## DEDICATION

I dedicate this work to the memory of my father, Akaekwuchionwa, Chief Amadi F. Okoli, whose love for books inspired and influenced me to become a lifelong learner.

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## **Chapter 1: Introduction**

The physical environment of a college or university campus is the theater in which student engagement is acted out, but none of the engagement indicators found in the literature reflected students' attitudes to the physical environment. One of the primary purposes of higher education is to advance student learning. "The most important factor in student learning and personal development during college is student engagement, or the quality of effort students themselves devote to educationally purposeful activities that contribute directly to desired outcomes (Astin, 1993; Pascarella and Terenzini, 1991)" (Hu & Kuh, 2002, p. 555). Student engagement refers to the "time and effort students devote to activities that are empirically linked to desired outcomes of college, and what institutions do to induce students to participate in these activities" (Kuh, 2009b, p. 683). Student engagement is important because it affects learning outcomes (Coates, 2005; Graham, Tripp, Seawright, & Joeckel, 2007; Pascarella, Seifert, & Blaich, 2010; Trowler & Trowler, 2010), and improves persistence and retention rates (Krause, 2005; Kuh, Cruce, Shoup, Kinzie, & Gonyea, 2008a). Persistence and retention are imperative for degree completion; and college degrees provide significant social benefits (Habley & Schuh, 2009). Student engagement can also have institutional benefits by enhancing institutional reputation and marketability, which may result in financial gains (Coates, 2005; Kuh, 2009a; Pascarella et al., 2010). Furthermore, student engagement has been linked to increased alumni donations to institutions. For example, Field (2011) found a relationship between the extent to which the campus environment is engaging and alumni donor participation rates for Carnegie classified Baccalaureate institutions.

Research on student engagement emerged from the quest by higher education institutions to better understand the factors that contribute to students' success in college (Carini, Kuh, &

Klein, 2006; Pascarella & Terenzini, 2005). This quest has also uncovered some predictors of student engagement and has led to the development of instruments for their measurement. The National Survey of Student Engagement (NSSE) provides one such instrument, which is the most widely used in North America. The NSSE instrument outlines five indicators that cumulatively assess student engagement. These indicators are: *interaction with faculty*; *learning with peers*; *academic challenge*; *campus environment*; and *high impact practices*. The NSSE was specifically designed to assess the extent to which students are engaged in empirically derived good educational practices and what they gain from their college experience (Kuh, 2001). The physical environment of the campus also influences a student's college experience (Banning & Hughes, 1986; Strange & Banning, 2001b), but none of the NSSE engagement indicators are directly related to the physical environment. Since the literature suggests that the physical environment contributes to shaping student experience in college, it appears that an examination of students' attitudes about the physical environment of their campuses should be made.

Sense of place is one such attitude that this study examines. Sense of place is the emotional bonding that exists between an individual, or group, with a geographic setting (Banning, Clemons, McKelfresh, & Gibbs, 2010). It has been suggested that the stronger the sense of place an individual has, the more she or he is likely to engage in place-protective behavior; it may also lead to goal support and self-regulation (Scannell & Gifford, 2010a). A favorite place is a reflection of a strong sense of place, and represents a "secure comfortable environment conducive to self-reflection, problem-solving and stress-relief" (Scannell & Gifford, 2010a, p. 6). It is a "safe haven where individuals can plan for implementation of their goals, and evaluate their progress" (Scannell & Gifford, 2010a, p. 6). Therefore, a strong sense of place

may be a precursor to student success in college, just like student engagement. Sense of place has also been linked to college students' commitment in terms of their persistence and loyalty to their institution (Kinzie & Kuh, 2007); and it is one of the expected outcomes of campus design.

According to Dober (2003):

Campus design is the art of campus planning, the culminating act of those processes and procedures that give form, content, meaning, and delight to the physical environment serving higher education. Designs thus created can define and celebrate a sense of place; communicate an institution's purpose, presence, and domain; and generate an image charged with symbolism, graced by history (p. 3).

The physical setting has an influence on one's sense of place. An individual may become attached directly to the attributes of a physical setting, such as a lake or forest; or indirect attachment may occur, where certain features of the setting enable behaviors that either produce attachment or result in important meaning to which an individual becomes attached (Stedman, 2003b).

In light of the relationships that appear to exist between *sense of place*, the physical setting of a campus, and certain measures of success in college such as persistence and retention, the rapid growth in construction of college buildings takes on added significance. How does the higher education sector ensure that student engagement and the person-place bonding described as sense of place receives appropriate attention in the design of new campus places?

For many years there has been a steady increase in the volume of construction of new and renovated campus facilities, especially at major research universities in the United States. Throughout the history of higher education in the United States, except for the early years of the colonial colleges, demand for space has grown steadily because of steady growth in enrollment.

From the 1890s to the 1970s, enrollment grew exponentially (Cohen, 1998; Cole, 2009; Lucas, 1994). Even for institutions that are no longer growing their enrollment, such growth in space demand is fueled by growth in research, especially in the health sciences (Cole, 2009). Should enrollment and research activities be held at current levels, there would still be significant construction in higher education because many old buildings are likely to be torn down, rebuilt or renovated. Many buildings built in the 1960s and 1970s are now being torn down on many college campuses because they were not designed to anticipate changes that would occur in scientific research, teaching and learning.

Many current facilities are being designed and built following traditional assumptions about research, teaching and learning, even when the educational enterprise is being challenged to reconsider its epistemological assumptions. For instance, the shift towards constructivist theory of learning calls for classrooms with flat floors and flexible seating that can be reconfigured to suit varying learning needs and styles; instead, most of the classrooms in use on college campuses are the traditional type with fixed seating facing in one direction. Moreover, student engagement and sense of place, as precursors of success in college, do not receive adequate consideration in the design of campus facilities. Once facilities are built, they can last fifty to one hundred years or more; they can aid or limit the kinds of activities and innovations that take place within their walls.

Therefore, it is important that an examination be made of the transformation of the learning environment that is taking place, including the intersection of student engagement and sense of place, to ensure that the physical campus environment being created today will support and promote students' learning agendas today and tomorrow. Since student engagement is an important predictor of student success in college, sense of place would also be considered

important in predicting student outcomes since it was found to be significantly associated with student engagement.

The remainder of this chapter will present the research problem, purpose of the study, research questions, significance of the study, definitions of terms, delimitations and limitations of the study.

### **Statement of the Problem**

Research has found that student engagement is associated with positive educational outcomes for college students in terms of their learning, development, retention, persistence and overall achievement (Astin, 1993b; Kuh et al., 2008a; Pace, 1979; Pascarella, 1985; Pascarella et al., 2010; Pascarella & Terenzini, 2005; Tinto, 1993, 2005, 2012). Also, the literature suggests that sense of place has a significant positive association with student engagement (Kramer, 2007; Strange & Banning, 2001b). Moreover, "students' commitment, in terms of persistence and loyalty to the institution, can be strengthened by intentionally creating a strong 'sense of place' through connecting campus architecture and design to meaningful experiences and memories of activities" (Kuh, Kinzie, Schuh, Whitt, & associates, 2005, p. 28). Despite the claims that a significant positive relationship exists between sense of place and student engagement in college, no empirical studies that linked these two constructs were found. In addition, none of the existing instruments for measuring student engagement, such as the National Survey of Student Engagement (NSSE) instrument, includes scale items for sense of place or students' attitudes to their physical campus environment.

### **Purpose of the Study**

The purpose of this study was to investigate the relationship between student engagement and sense of place; the overarching intent is to impact change at colleges and universities by

helping higher education policy makers, administrators, faculty and staff gain a better understanding of the role of sense of place in fostering student engagement and learning.

### **Significance of the Study**

The significance of this study is its ability to inform university administrators of the relationship between sense of place and student engagement. In turn, this awareness can inform the decisions related to allocation of limited institutional resources to campus planning and design activities aimed at enhancing sense of place. This is even more important for public institutions by helping legislators to appreciate the need to fund projects that enhance sense of place, especially campus landscape projects. Legislators have commonly tended to view such projects as mere campus beautification efforts that have no relevance to student learning outcomes.

### **Research Questions**

The research questions that guided this study are:

1. Is there a statistically significant association between *sense of place* and *student engagement* among undergraduate students at Colorado State University (CSU)?
2. Is there statistically significant association between *Campus Design* and *Student engagement* among undergraduate students at CSU?
3. Is there statistically significant association between *Campus Design* and *Sense of Place* among undergraduate students at CSU?
4. Are there statistically significant associations between components of *sense of place* (*place attachment* or *place-based affect* (affective attachment), *place dependence*, and *place identity*), *campus design*, and the following engagement



indicators from the NSSE: *academic challenge, learning with peers, experiences with faculty, campus environment, and high-impact practices*?

5. Are there statistically significant associations between *sense of place, campus design*, the five engagement indicators from NSSE (*academic challenge, learning with peers, experiences with faculty, campus environment, and high-impact practices*), and *grade point average*?
6. Are there statistically significant differences among the four classifications of undergraduate students on their *campus design, sense of place, and student engagement* scores?
7. How well does the combination of *sense of place, campus design, gender, racial/ethnic identity, and enrollment status* (full-time/part-time) *predict student engagement*?

### **Definition of Terms**

*Built environment*: Any environment consisting largely of human-made structures.

*Campus architecture*: The buildings on a college or university campus.

*Campus landscape*: The site features on a college or university campus.

*Natural environment*: Any environment that consists mostly of natural features without man-made elements.

*Place attachment (place-based affect)*: The affective bond between people and specific places (Hidalgo & Hernandez, 2001).

*Place dependence*: The extent to which people perceive themselves to be strongly associated with, and dependent on a particular place (Moore & Graefe, 1994).

*Place identity*: Those dimensions of self that define the individual's personal identity in relation to the physical environment by means of a complex pattern of conscious and unconscious ideas, beliefs, preferences, feelings, values, goals, and behavioral tendencies and skills relevant to this environment (Proshansky, 1978, p.155).

*Place making*: The structuring of the overall design, the broader skeleton, the articulated pattern, that is, the campus plan (Dober, 1992).

### **Delimitations and Limitations**

#### **Delimitations**

Delimitations of the study include:

1. The study was confined only to Colorado State University (CSU) undergraduate students.
2. Participants' responses were the reflections of, and confined to, their personal experiences as undergraduate students at CSU.
3. The study provided only undergraduate students' perspectives on student engagement, sense of place and campus design, and excludes all other campus constituents.

#### **Limitations**

Limitations of the study include:

1. This study had the potential risk of a non-response error; this happens when differences exist between those who respond and those who do not respond when there is a low response rate (Dillman, Smyth, & Christian, 2009).

2. The length of the survey instrument may have contributed to the many missing values in the data, thereby reducing the valid sample size to a degree that raises issues about nonresponse bias and generalizability.
3. Limited contacts with the students invited to participate in the survey (initial invitation and two reminders) may have contributed to the low response rate.

### **Researcher's Perspective**

My own experiences, working in facilities planning, design, and construction, as well as working in student services, and teaching on college campuses, have informed my perspective on the impact of the physical environment and campus design on student engagement. I currently serve as a campus architect at a major public research university with the opportunity to oversee the planning, design and construction or renovation of many buildings. I also lived in residence halls as both as an undergraduate and graduate student. Over the years, I have seen successful campus places where people wanted to gather and socialize, but I have also seen unsuccessful ones that were devoid of people. I have come to believe that the physical environment has more profound impact on human behavior and ability to thrive than I had thought.

The experience that most profoundly shaped my perspective about space, place, and student engagement did not take place on a college campus, but at a train station. I once lived and worked in New York. I often travelled through Grand Central Station, and occasionally I would travel through Penn Station. Both stations shared many characteristics in common such as the large volume of people who travelled through them daily, the shops, food, and myriad other activities that took place there.

One day I realized, however, that I was not upset whenever I missed my train at Grand Central Station. I always looked forward to sitting down for dinner at one of the restaurants, or

browsing at the bookstores, or simply sitting down to watch people or the laser displays that would be staged from time to time. I did not mind lingering there. It finally dawned on me that Grand Central Station was not just a place I had to be, but it was also a place I wanted to be. This was not the case with Penn Station; I could not wait to get out of the station once I arrived there. The difference lay in the ambience, proportions and detailing of the spaces at Grand Central Station. In other words, the “look and feel” of the place was the difference. This was the beginning of my quest to understand why and how an individual may become attached differently to different places even when they served similar functions. So I embarked on my research journey with the perspective that the design of one’s physical environment influences behavior and attitudes.

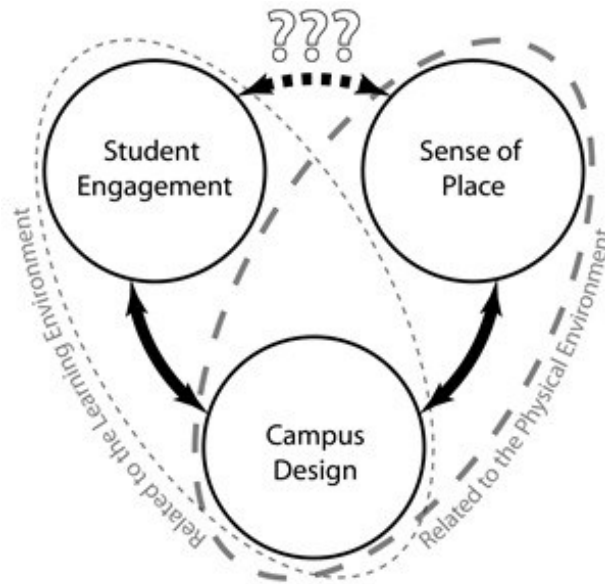
I have also lived, studied and worked on three different continents and many cities. I have been to places I considered beautiful, and they continue to inhabit my memory. Some of these places were man-made and others were natural settings. Such places exist in every country and every continent I have been to. I have also been to places that were not beautiful and I remember them too. So, prior this study, I held the belief that the aesthetic qualities of a place influence the development of sense of place. Although individuals can have memory of beautiful and ugly places alike, they only cherish memories of beautiful places; cherished memories are an ingredient of sense of place.

Finally, my perspective was shaped by my childhood as I realize that the place I am most attached to is my family’s village home and my hometown. But this attachment had more to do with the social bonds that I formed there, and my cherished memories of the place, than the beauty of the place. Although my home town is no longer what it used to be, as it has become more urbanized, and my family home has since been replaced with another structure, I still hold

unto m memories of the place. So, I believe that sense of place may be linked more to social bonds than visual impact although both are important.

## Chapter 2: Literature Review

The literature review is organized into three major sections: student engagement, campus design and sense of place. After exploring student engagement in literature, the review examines literature dealing with the relationship between specific engagement indicators and outcomes, and the design of campus facilities and infrastructure. The design of learning spaces, in relation to student engagement and learning outcomes in the literature is explored in detail. The rest of the review focuses on campus design in general, how the intentional design of campus facilities relates to sense of place. Then, an in-depth review of sense of place in the literature is given. The chapter concludes by establishing the gap that exists in the literature between sense of place and student engagement. Figure 2.1 shows the three focus areas for the literature review.



*Figure 2.1. The Organization of the Literature Review*

The solid two-way arrows in the diagram indicate that connections exist in the literature between student engagement and campus design, and between sense of place and campus design.

The broken two-way arrow with question marks connecting student engagement and sense of place indicates that a gap exists, and asks whether there is indeed a connection and what it is.

Sense of place and campus design are both related to the physical environment and are shown enclosed within the ellipse with gray-dashed lines. These relationships to the physical environment are derived from their definitions. Sense of place is defined in this study as an emotional bonding to a particular geographic location by an individual or a group (Bott, Banning, Wells, Hass, & Lakey, 2006). Dober (2003) defined campus design as the "art of campus planning, the culminating act of those processes and procedures that give form, content, meaning, and delight to the physical environment serving higher education" (p. 3). Student engagement and campus design both relate to the learning environment as shown in Figure 2.1.

### **Student Engagement in Higher Education**

One definition of engagement is being involved with something in an attempt to understand it (Hornby & Turnbull, 2010). This suggests that student engagement deals with students being involved or engaged with their education in order to enhance learning. In other words, the more students are engaged the more they learn.

No unique and simple definition of student engagement exists, but it generally refers to the efforts and resources that both students and their institutions intentionally invest in activities that enhance learning. Multiple perspectives in the literature regarding who has the responsibility for student engagement underlie the complexity of its definition. One perspective emphasizes what students do to influence their own learning. For instance, Kuh and his colleagues defined student engagement as "participation in educationally effective practices, both inside and outside the classroom, which leads to a range of measurable outcomes" (Kuh, Kinzie, Buckley, Bridges, & Hayek, 2011, p. 44). It has also been defined as "the quality of effort students themselves

devote to *educationally purposeful* activities that contribute directly to desired outcomes” (Hu & Kuh, 2002, p. 555), and as “the extent to which students are engaging in activities that higher education research has shown to be linked with high quality learning outcomes” (Krause & Coates, 2008, p. 493).

Other definitions suggest that institutions, rather than students, have the responsibility for student engagement, thus defining it as “the process whereby institutions and sector bodies make deliberate attempts to involve and empower students in the process of shaping the learning experience” in HEFCE’s (2008) Tender for a Study into Student Engagement (as cited in Trowler, 2010, p. 16). The most commonly accepted definitions tend to combine both student and institutional responsibilities. Kuh (2009a), for example, has defined student engagement as “the time and effort students devote to activities that are empirically linked to desired outcomes of college and what institutions do to induce students to participate in these activities” (p. 683). Summarizing various definitions of student engagement in the literature, Trowler (2010) stated that:

Student engagement is concerned with the interaction between the time, effort and other relevant resources invested by both students and their institutions intended to optimize the student experience and enhance the learning outcomes and development of students and the performance, and reputation of the institution (p.3).

This summary further highlights the complexity of defining student engagement, as does the following definition by Kuh (2009a, p. 5):

The engagement premise is straightforward and easily understood: the more students study a subject, the more they know about it, and the more students practice and get feedback from faculty and staff members on their writing and collaborative problem



solving, the deeper they come to understand what they are learning and the more adept they become at managing complexity, tolerating ambiguity, and working with people from different backgrounds or with different views.

### **Theoretical Models for Student Engagement Research in Higher Education**

The term *student engagement* began to feature more prominently in research in the mid-1990s (Trowler, 2010), but the idea of engagement has been in the literature since the 1930s and its meaning has evolved over time (Kuh, 2009a). According to Kuh (2009a), "One of the earliest iterations (of student engagement) was the pioneering work of the eminent educational psychologist Ralph Tyler, showing the positive effects of *time on task* on learning Merwin (1969)" (p. 6). Much of the credit for the evolution of student engagement theory, however, goes to Pace (1960-1984), Astin (1984,1985), Chickering and Gamson (1987), Pascarella (1985), Kuh, Whitt and Associates (1991), Tinto (1993), and Kuh et al. (2005).

C. Robert Pace, after decades of research, developed the College Student Experiences Questionnaire (CSEQ) in 1979 to assess what he termed "quality of effort" students invest in using the opportunities and resources their institutions provide for their learning and development. According to Pace (1982), "All learning and development require an investment of time and effort by the student. Time is a frequency dimension. Effort is a quality dimension because some kinds of effort are more educative than others" (p. 2). Time deals with how often, or how long one invests on a task (time on task); effort deals with the quality of the effort. In his study, Pace (1982) defines "time on task" as how long students have been in college, or how many hours per week they usually spend on activities related to their schoolwork. Quality of effort deals with the extent to which students take advantage of the opportunities and resources the institutions make available to enhance their learning and development. For instance, a student

who uses the library to study and do research, browses the stacks, reads assigned material, looks up references and learns the various software available through the information commons has a higher quality of effort score than one who merely uses it to read his or her own personal text book. The former is taking more advantage of the “potential the library has to offer – greater degrees of independent exploration, learning how to find information one needs, and thereby increasing one’s competence for independent learning” (Pace, 1982, pp. 3-4). Pace concludes that students gain more from their studies and college experience by investing more time and energy in educationally purposeful tasks, such as interacting with their faculty and peers about educational activities, applying what they learn to practical situations, and studying (Pace, 1990).

Building on the “quality of effort” model, Astin (1984) developed the “theory of involvement” which claims that the more students are involved in both academic and social aspects of their college experience, the more they learn. It is a student development theory based on student involvement, which “refers to the amount of physical and psychological energy that the student devotes to the academic experience” (Astin, 1999, p. 518). A highly involved student is one who “devotes considerable energy studying, spends much time on campus, participates actively in student organizations, and interacts frequently with faculty members and other students” (Astin, 1984, p. 292; Astin, 1999, p. 518). Conversely, “a typical uninvolved student neglects studies, spends little time on campus, abstains from extracurricular activities, and has infrequent contact with faculty members or other students” (Astin, 1999, p. 518). The involvement theory, according to Astin (1999), has the following five basic assumptions:

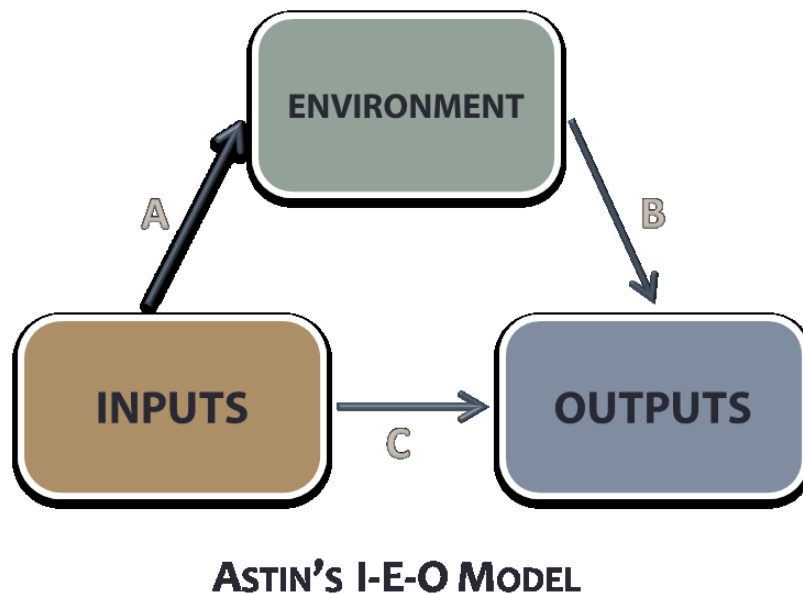
1. Involvement requires the investment of physical and psychological energy in various student experiences or specific activities.

2. Involvement occurs along a continuum such that different students may show different degrees of involvement for different experiences or activities, whereas the same student may manifest different degrees of involvement for the same activities or experiences at different times.
3. Involvement has both qualitative and quantitative features. So one can measure how long (quantity of time) a student spent reading a mathematics textbook as opposed to how engaged (quality of effort or involvement) he or she is with the material (e.g. taking notes, cross-referencing, and solving problems).
4. The amount of student learning and development is directly proportional to the quality and quantity of student involvement.
5. The effectiveness of any educational policy or practice is directly related to the capacity of that policy or practice to increase student involvement.

Additionally, the quality and quantity of involvement affects the amount of learning and development (Astin, 1984, p. 297). Astin's work brought together the "time on task" concept with Pace's "quality of effort" model. This theory marks a departure from Astin's earlier *input-process-output* model (Pascarella & Terenzini, 1991, p. 50) in which students are passive agents in their own development, and higher education (with its resources) is solely responsible for student development. In Pace's quality of effort model, students have the responsibility to determine how involved they want to be, or the quality of effort they want to invest to capitalize on the resources and opportunities that their institution must provide.

Having developed the theory of involvement to explain the dynamics of how students develop in college, Astin (1993a) went on to develop the Input-Environment-Output (I-E-O) Model as a framework to guide assessment in higher education. The basis for this theory is that

educational assessment is the key to a better understanding of the relationship between educational practices and outcomes. However, wrong assumptions about inputs (the characteristics that students bring) lead to inaccurate assessments; minimizing such errors related to inferences about inputs, provides more accurate assessment (Astin, 1993a). In this model, *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)" (Astin & Antonio, 2012, p. 19); these student characteristics at the time they enter college include demographics, student background, and previous experiences. *Environment* refers to "the student's actual experiences during the educational program" (Astin & Antonio, 2012, p. 19); in other words, the environment consists of institutional interventions which include educational programs as well as the range of experiences that students encounter during college. *Outcomes* refers to "the 'talents' we are trying to develop in our educational program" (Astin & Antonio, 2012, p. 19); these are indicators of student achievement, growth or development such as characteristics, attitudes, knowledge, beliefs, and values that result from college experience. The primary purpose of this model is to control input differences in order to reduce bias and inaccuracy in estimating how the environmental variables affect student outcomes. Inputs directly lead to outcomes, or indirectly by interacting with the college environment in order produce outcomes as illustrated in Figure 2.2.



*Figure 2.2. Astin's (1993) I-E-O Model*

Among the advantages of this model, stemming from the presumption that it was developed for research in natural settings as opposed to true experiments, are that it avoids artificial conditions and lends itself to the simultaneous study of multiple environmental variables. Moreover, research in natural settings allows data that were gathered in a variety of educational environments to be contrasted, thereby improving generalization across settings (Thurmond & Popkess-Vawter, 2001). On the other hand, lack of randomization can present a challenge in natural settings, since student input variables are not controlled. As Astin and Antonio (2012) stated:

People are seldom distributed across different environments at random; they generally pick their environments and environments to a certain extent select their people. Thus, in any real-life situation we tend to find different types of people (in terms of input characteristics) being exposed to different environments (p. 83).

This study, however, was designed to address problems related to non-random sampling in non-experimental studies (Astin & Sax, 1998). The I-E-O model is "simple, yet it provides a powerful framework for the design of assessment activities and for dealing with even the most complex and sophisticated issues in assessment and evaluation" (Astin & Antonio, 2012, p. 17). Hence, it provides the framework for developing measurement scales for student involvement and the contribution of the institutional environment to involvement. But, Astin's (1993) model does not fully explain the interactions between the various input and environmental variables in the same way as Tinto's (1993) model (Field, 2011).

Tinto's Theory of Student Departure (1993) is an interactive model that explains the college student withdrawal process. The core ideas of the theory are: (a) Pre-entry attributes; (b) Goals/commitments; (c) Institutional experiences; (d) Integration; and (e) Outcomes. According to Tinto (1993), students' personal attributes prior to entering college (such as gender, socio-economic status, ethnicity, and pre-college ability) influence their initial commitments to pursue certain educational goals and attend certain institutions. These initial commitments are presumed to influence choice of college. Upon enrollment, they also interact with academic and social components of the institution resulting in academic and social integration. Academic integration refers to students' academic performance and their interaction with faculty and staff; social integration indicates students' participation in and satisfaction with co-curricular activities and interaction with peers. Students' commitments to their institutions, and to their goals to complete college together with their different levels of academic and social integration, directly influence their decisions to persist in or withdraw from college. Figure 2.3 and figure 2.4 show two iterations of Tinto's model.

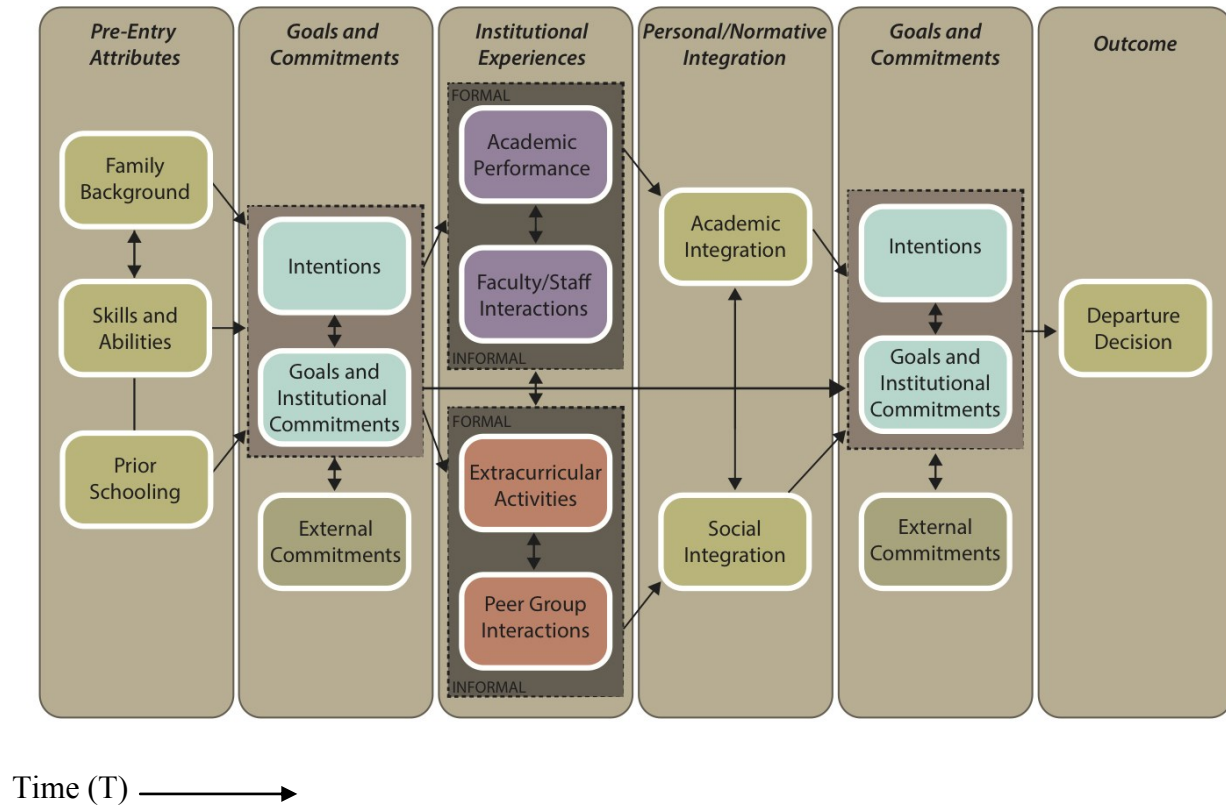


Figure 2.3. Tinto's (1987) Model

Tinto's (1993) model shares commonalities with Astin's I-E-O model (1984); both posit that what students bring to their college environment interacts with that environment to produce outcomes. Students' personal attributes prior to entering college shape their goals, expectations, and aspirations. The extent to which these are met by the institutions influence students' continued commitment to their goals and institutions, and is a significant factor in determining whether or not they persist to graduation.

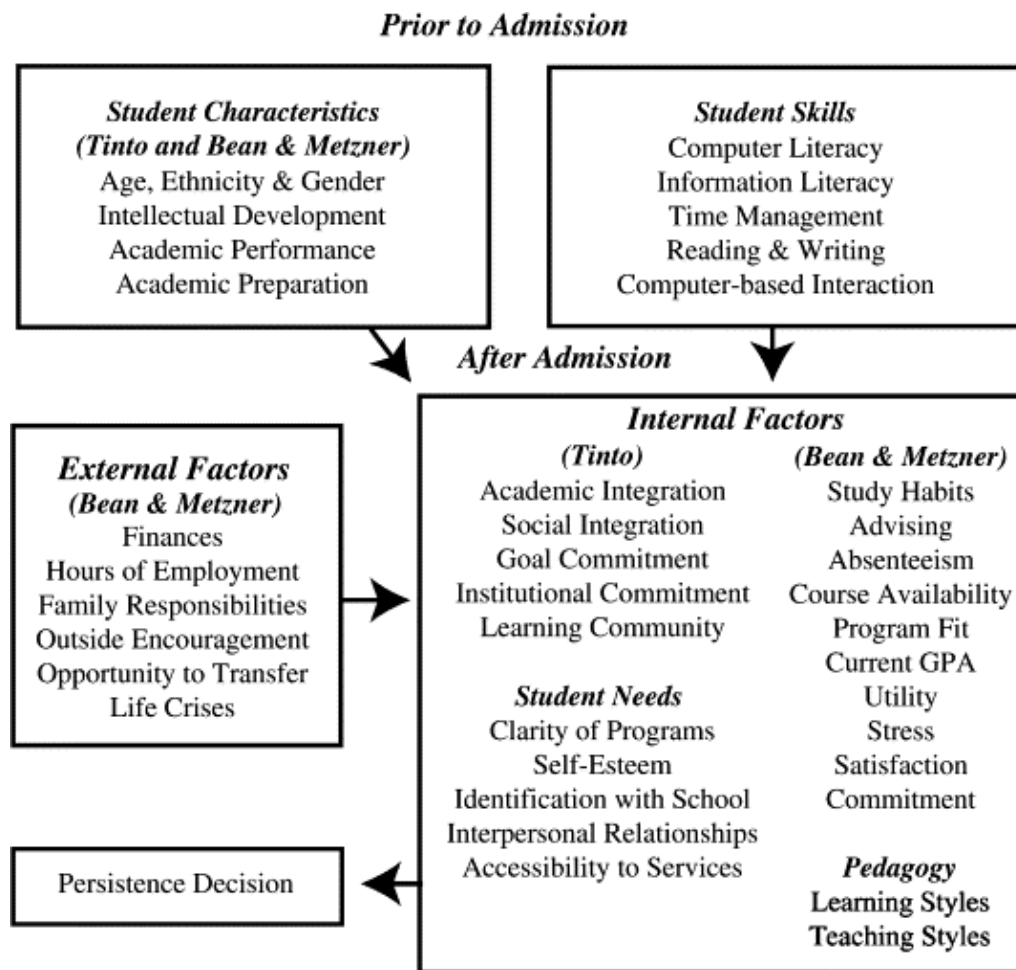


Figure 2. 4. Tinto's (1995) Model of Student Departure

The key difference between these two models is that Tinto's (1993) model explains how the *inputs* interact with factors in the environment to produce outcomes better than Astin's (1984) model. But according to Pascarella and Terenzini (2005):

Tinto's (1975, 1987, 1993) model is largely concerned with intra-institutional influences on students. He devotes less attention to the influence of an institution's characteristics or to the role of individual student effort. Pascarella (1985) suggests a model that includes explicit consideration of both...providing a conceptual foundation for multi-institutional studies of collegiate impact (p. 56).



Pascarella's General Causal Model for Assessing Change (1985) assesses student change and considers the direct and indirect effects of both an institution's environments and its structural characteristics. The key sets of variables that it explores are: student background/pre-college traits (e.g. aptitude, achievement, personality, aspiration, and ethnicity), structural/organizational characteristics (e.g. enrollment, faculty-student ratio, selectivity, and percentage of the students living on campus), institutional environment, interactions with agents of socialization, and quality of student effort. This model recognizes that factors external to the institution play a major role in shaping college students' decisions and attitudes. For instance, student background/pre-college traits influence students' experiences (college environment), which influences their quality of effort and, in turn, their cognitive development as shown in Figure 2.5.

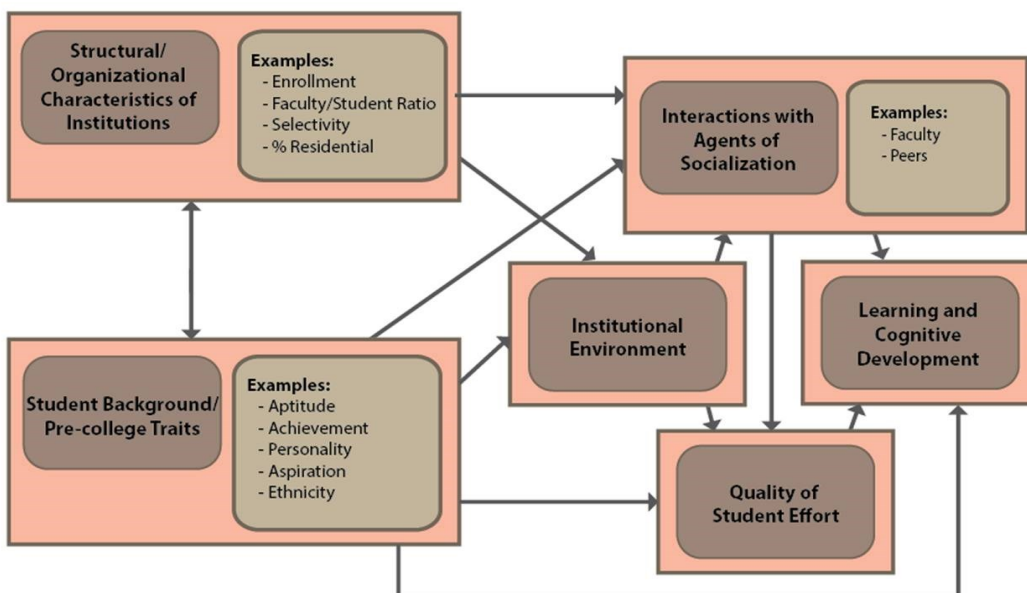


Figure 2.5. Pascarella's General Causal Model

Building on Pascarella (1985), Terenzini and Reason (2005) defined factors that influence what students bring to their institutional environment, while maintaining Pascarella's (1985) central idea that what students bring to college and their college experiences determine their learning outcomes. According to Terenzini and Reason (2005), the two factors within the campus environment that influence student learning outcomes are: (a) organizational context (e.g. policies, programs, and culture), and (b) peer context (e.g. co-curricular experiences, interactions with peers in and out of the classroom). With an overriding focus on improving student learning outcomes, a study that echoes similar themes was done by Chickering and Gamson (1987).

Chickering and Gamson (1987) identified Seven Principles For Good Practice in Undergraduate Education. These seven principles are: (1) encouraging contact between students and faculty; (2) developing reciprocity and cooperation among students; (3) Encouraging active learning; (4) giving prompt feedback; (5) emphasizing time on task; (6) communicating high expectations; and (7) respecting diverse talents and ways of learning.

These practices are significant for this study since they form the foundations to the benchmarks for the development of the student engagement instruments. The current state of student engagement theory reflects all these major models and contributions from myriad other scholars not mentioned in the study. The work on student engagement by Kuh and others are significant in this respect (Kuh, 1991; Kuh & Documenting Effective Educational Practice (Project), 2005).

### **Student Engagement Theory Today**

Student engagement theory is built on a foundation of more than seventy years of research aimed at improving students' learning outcomes. These ideas include Tyler's notion of

*time on task* discussed by Merwin (as cited in Kuh, 2009a), followed by Pace's (1979) *quality of effort*, as a determinant of learning outcomes, and Astin's (1999) theory of involvement. The essence of the current student engagement theory is that students' experiences, combined with institutional characteristics, determine the level of engagement on a college campus (Astin, 1975, 1985, 1993b; Kuh, 1991; Kuh & Documenting Effective Educational Practice (Project), 2005; Pace, 1982). Given that the quality and quantity of student involvement is critical to student engagement in college, institutions must also develop programs that promote engagement (Pascarella & Terenzini, 2005), and make policies that enhance their college experience (Kinzie & Kuh, 2004, Kinzie et al., 2005). These student inputs and campus environment factors were used in developing the instruments for measuring student engagement in higher education.

### **Measuring Student Engagement in Higher Education**

Student engagement has been defined in multiple ways, but generally, it refers to the cumulative time, effort and other resources invested by both students and their institutions to enhance student development (Trowler, 2010). Research has established correlations between student engagement and positive student outcomes including persistence, student achievement, satisfaction, and social engagement (Astin, 1984; Astin, 1993b; Chickering & Gamson, 1987; Kuh et al., 2008a; Pascarella & Terenzini, 2005; Tinto, 1987). Given the importance of student engagement, instruments have been developed for its measurement, including the National Survey of Student Engagement (NSSE) questionnaire (Indiana University, 2009; Kuh, 2012; NSSE, 2012b; Pascarella et al., 2010). A sample NSSE instrument is displayed in Appendix A.

The NSSE instrument was used in this study. This instrument measures five engagement indicators: (a) academic challenge, (b) learning with peers, (c) experiences with faculty, (d)

campus environment and (e) high-impact practices. These indicators are further described in the instrumentation section of Chapter 3 and in Appendixes B and C. Whereas the instrument has campus environment as an engagement indicator, the focus is on the quality of interactions with other members of the campus community, and how supportive the institution is in terms of the programs, policies, and opportunities it provides for students to engage. No items were developed to assess the quality of the physical facilities or students' attitudes towards the built and natural environment of the college campus. In essence, sense of place is not reflected in this instrument as a potential indicator of student engagement.

### **Exploring the Linkages**

No direct link has been found in the literature between sense of place and student engagement. These two constructs are, however, linked independently to the physical environment. This section will explore these separate links and introduce the concept of campus design that represents an effort at placemaking on a college campus. According to Dober (2003), “placemaking is the structuring of the overall design, the broader skeleton, the articulated pattern, that is, the campus plan” (p. 4). Learning spaces are then explored in relationship to campus design, student engagement and learning outcomes.

The college environment within which student engagement takes place has a physical dimension. The intentional design of a college's physical environment can enhance the interactions between members of the college community, and facilitate learning and activities that are considered to be educationally purposeful. The most obvious connection between student engagement and campus design is the learning environment.

## **Student Engagement and the Learning Environment**

The impetus for student engagement research has stemmed from the quest to enhance student learning and development. The interactions between students and their institutions that produce desired outcomes do not take place in a vacuum. They take place in a learning environment that has social, psychological, cultural and physical dimensions. In recognizing the multi-dimensional nature of the college environment, Pace (1982, pp. 2-3) stated:

The college experience consists of the events that occur in a college environment. The relevant experiences are ones that stem from events and conditions and facilities which the college environment makes possible, and which are intended to facilitate student learning and development. The most salient of these events and experiences are clustered around a number of fairly common behavior settings. A behavior setting is a place, a physical setting, in which certain types of activity typically occur.

Pace (1982) pointed out that some of the most common of these behavior settings include college facilities such as classrooms, libraries, athletics venues, residence halls, student unions, recreational facilities, laboratories, and others. Further, there are experiences and events that are not necessarily connected to specific facilities but provide opportunities for personal and social development; these include contact with faculty members, quality of interactions with other students, involvement of extra-curricular activities and experiences in writing (Pace, 1982).

Clearly, the manner in which students capitalize on the potential that these facilities and opportunities their college environment provides is an indication of how engaged they are. Therefore, the current study is important because it investigates whether students' attitudes to the

physical environment of their campus influences their level of engagement. Since engagement behaviors and learning occur within this behavior setting, the physical setting of the campus is the theater of engagement and learning.

The built environment of the campus and students' attitudes towards it influence engagement behaviors, and involvement. Sir Winston Churchill was quoted as saying, "We shape our buildings, and then our buildings shape us" (as cited in Strange & Banning, 2001a, p. 12). Whereas environmental psychologists agree that the built environment has an impact on human behavior, they disagree on the magnitude of such impact. Some scholars claim that the built environment is the primary or sole determinant of social behavior (Ellen, 1982), and this position is referred to as architectural determinism or environmentalism. In contrast, proponents of architectural or environmental possibilism, subscribe to the idea that the built environment may limit some human action, but people have the ability to adjust to their environment (Wissler, 1929). The third position, environmental or architectural probabilism, advances the idea that certain behaviors have a probabilistic link to the built environment. For example:

An attractive, warm, and welcoming entrance to a campus building will increase the probability of being entered more so than if it is cold and unwelcoming. The welcoming entrance does not cause entry, but the probability of entry can be increased with proper design (Strange & Banning, 2001a, p. 14).

Campus designers and architects who subscribe to architectural determinism or environmentalism are likely to create built environments with the idea that people can adapt to any space configuration. They are likely to overlook the complexity that is inherent in the interaction between environment and behavior. Architectural or environmental determinism influenced traditional campus facilities design, and traditional learning theories also supported

this approach. This did not pose a significant problem when, according to Lucas (1994), traditional colleges were small, almost demographically homogeneous, and everybody knew everyone else on campus such that social interaction was relatively easy.

Some of the traditional models of learning theories, with their focus on individual students' roles, were appropriate for the traditional campus environment. For instance, college students' beliefs about their own abilities or self-efficacy (Bandura, 1997), as well as their attributions for success or failure (Weiner, 1992), influence their goals and motivation for academic work. Some theories, however, look beyond the individual student to focus on the social context of learning. Learning within a social context (or social constructivism) and promoting group construction of knowledge is the ideal approach for some learners (Jaworski, 1996). Other approaches to learning create awareness of students' social conscience; they promote an awareness that social transformation is possible through action such as conscientization (Freire & Faundez, 1989), and can stimulate learning especially for students from minority or traditionally disadvantaged groups. Theories of multiple intelligences (Gardner, 1993) and learning styles (Kolb, 1981) challenged long-held assumptions about learning that can limit the way a college student's role in the classroom is viewed.

Greater understanding of the various learning theories provided the impetus for a paradigm shift that is beginning to occur from the instruction paradigm to the learning paradigm. The traditional model of teaching and learning viewed teaching as "the transfer of information, and learning as the ability to acquire, recall, and repeat information" (Fried, 2006, p. 3). A room that is designed solely to transfer information from teacher to student will not be suitable for the kind of learning that is characterized by a process that enables students to interact with their

instructors, peers, and environment as they “acquire, analyze, and place information into a pre-existing pattern of meaning, often expanding or altering that pattern” (Fried, 2006, p. 5).

Treated as a learning environment, the physical campus should be explored as a learning space to understand its relationship to student engagement as portrayed in the literature.

## **Learning Spaces**

The concept of “learning spaces” has received a great deal of attention in recent literature and has been considered so important that EDUCAUSE, a leading non-profit organization that promotes the intelligent use of technology to advance higher education, has published extensively on learning spaces on its website (Chism, 2006). These articles, however, focus on the classrooms or formal learning environments; similarly, there are many other articles and studies that are devoted to the formal learning environment (Chism, 2006). Another commonality with much of the literature in this area is the lack of formal definition of ‘learning spaces’. It is also common in much of the literature to use ‘learning spaces’, ‘learning environments’ and ‘classrooms’ interchangeably (Bickford, 2002; Cornell, 2002; Dittoe, 2002; Graetz & Goliber, 2002). But, many make the distinction between physical learning and virtual learning spaces (Chickering & Schlossberg, 2002).

For the purpose of this study, a learning environment is “all the physical surroundings, psychological or emotional conditions, and social or cultural influences affecting the growth and development of an adult engaged in an educational enterprise” (Hiemstra, 1991). Learning spaces are “locations, either physical or virtual, formal or informal, that facilitate the learning process” (MacaPhee, 2007, p. 1). The informal physical learning environment is where students spend most to their time, but it is the least studied in terms of its impact on student development.



It has been suggested that as much as 65 percent of learning occurs outside of classes and class-related activities, while 35 percent occurs within (Nathan, 2006). It follows that all campus places are important to student engagement and development, especially those places where much of the learning takes place. There is a consistent claim in recent literature that the physical environment can contribute to a college student's development in two important ways. First, the actual features of the physical environment can encourage or discourage the process of learning and development. Second, the process of designing the physical environment can also promote the acquisition of skills at the core of student development (Banning & Hughes, 1986). However, what are the elements of the physical environment that have a direct causal relationship with learning and how are their impacts effected?

### **Space Planning in Higher Education**

Historically, space planning in higher education has always focused on providing the appropriate amount of space for specific purposes, and maximizing the assigned space by employing various space management techniques (Abramson, 2006; Muller & et al., 1985; Space Management Project, 2006a). In the United States, the history of higher education has been characterized by steady growth in student enrollment and research enterprises requiring a corresponding demand for space (Altbach, Berdahl, & Gumport, 2005; Cole, 2009; Lucas, 1994). The increasing cost of construction has placed greater pressure on space management offices to tighten space allocation standards and strive for greater efficiency. Efforts aimed at cutting costs by maximizing space utilization may not always be aligned with other institutional priorities such as research, teaching, and learning. To align these often conflicting goals is a challenging space management function; but there is little evidence that space management decisions always

account for the relationship between space and the learning function that it should accommodate (Barnett & Temple, 2006).

To provide adequate space for a learning or educational function requires institutions to go beyond the physical dimensions of space, and consider its psychological component as well. Hathaway (1988) stated that the anxiety levels of building occupants increase when buildings are operated at or near maximum capacity, and suggested that "buildings may be psychologically full at approximately 80% to 90% of actual maximum capacity." Therefore quantitative measures alone should not be relied upon entirely to determine what students want from their physical campus environment. Students' perceptions of what is appropriate may be informed by more than numbers.

### **The Campus as a Learning Space**

The role that the campus plays as a learning space has not received plentiful attention in the literature, and when it appears it is not studied rigorously. While the physical environment is one of the key factors that foster student learning and development, it is "perhaps the least understood and the most neglected " (Strange & Banning, 2001a, p. 30).

Furthermore, Edwards (2000) stated:

Taking a broad sweep of nearly a thousand years of university construction, it is possible to draw one significant conclusion. Of all buildings types none more conspicuously links new ideals of design and innovative technologies to the mission of development than the university. The exacting agendas of intellectual inquiry, of scientific experiment, and refined taste, are historically to be found in the built form in the ancient universities of Oxford, Cambridge, Paris, Bologna and Turin. The ideals of democracy find expression

in the layout of universities from Virginia to Cape Town.... The campus has never been an ordinary place. (Edwards, 2000, p. 150)

Others, including Crook (1990) and Whisnant (1979), agreed that campus design and the architecture of individual university buildings might send signals about learning in general or a seriousness of purpose. There may be a belief that campus designers and architects intentionally attempt to reflect a building's purpose through its design, and the message inherent in the design is presumably interpreted by observers. Dober concurred when he stated that university "landmark" buildings "are cultural currency...charged with allegorical significance and perceptual connotations and meaning" (Dober, 2003, p. 5). University buildings seem important because people think that universities are important places.

### **Campus as Space for Building Community**

A college campus is as much a place for building community as it is a place for engaging in formal classroom learning activities (Temple, 2008; Temple & Barnett, 2007). It should be a place of social interaction that values differences, promotes learning through discourse, and is committed to teaching and learning, research and public service by those within the community (Keohane, 2006). The connection between building a community of learners and space has not been well researched. It has been suggested that the physical form of a campus is important in fostering the kind of network that promotes intellectual and social exchange (Temple & Barnett, 2007, p. 7). The suggestion here is that building community develops social network which is, in turn, the connection between physical space and intellectual space.

The notion that campuses and individual buildings send signals or communicate certain ideals that may influence learning is evident, where "the physical and the emotional become inextricably intertwined to form an almost palpable 'sense of place', one that has profound if not

always clearly understood meaning to many members of the campus community” (Burke, 2005, p. 93); but this point does not appear to be supported by research. There is also little evidence that what campus designers think about the places and buildings they design on campuses are aligned with what students, staff and faculty actually think. It can also be argued that many campus buildings, especially those that were built during the 1960s and 1970s, were designed intentionally to simply meet the functional needs of institutions without sending any grand messages. This was the case because of the explosion in student enrollments, “caused first by war veterans taking advantage of the G.I. bill for education, and in succeeding years by a steadily greater proportion of the population attending college and by the ‘baby boom’ generation that came of college age in the 1960s” (Turner, 1987, p. 249).

Flexible learning spaces, where different groups may be engaged in different activities simultaneously, or ones that are easily changeable to accommodate different uses, have received attention in past literature (Chism, 2006). The argument is that interactions between students would increase the effectiveness of learning, so campus places should be designed to provide a variety of spaces where students can socialize and work at the same time (Burke, 2005, p. 206).

Effective learning spaces, from a student’s perspective, are easily accessible, allow flexibility of use or are easily re-configurable, provide emotional warmth and thermal comfort; and they have amenities such as comfortable seating and wireless access. They also have 24-hour access whenever possible, and combine social and academic life. These places are also aesthetically pleasing. Findings from a study at Loyola University of Chicago concluded:

When students lack the social spaces necessary to interact and create meaningful bonds with their peers, and feel that they have little control or access to the few places they use

as third places, there could be a sense of alienation that manifests as an obstacle to establishing meaningful social atmosphere. (Schuette et al., 2007, p. 19).

Students, and the campus community at large, can experience the campus through their interactions with the exterior of buildings, the open spaces and landscapes or outdoor rooms that these buildings help to define, and the primary interior spaces within buildings. Their experience of place is enhanced through social interaction. Students are increasingly seeking environments that are inviting and make them feel comfortable. Campus designers and leaders should therefore seek to provide such environments. In his book, Ray Oldenburg (1999) described the importance of such a place which he called the “third place”. He called one’s home the “first place” and one’s workplace the “second place”. The “third place” is in between. According to Oldenburg :

The character of a third place is determined most of all by its regular clientele and is marked by a playful mood, which contrasts with people’s more serious involvement in other spheres. Though a radically different kind of setting for a home, the third place is remarkably similar to a good home in the psychological comfort and support that it extends....They are the heart of the community’s social vitality, the grassroots of democracy, but sadly, they constitute a diminishing aspect of the American social landscape. (Oldenburg, 1999, p. 42)

However, the need to drive up efficiency of space utilization tends to restrict what campuses can afford to do in order to create supportive learning environments. It is sometimes difficult to create extra space where chance encounters can occur between staff, students and faculty (Barnett & Temple, 2006, p. 10). The need to create human-scale in the physical learning environment is also a topic that is covered in the literature. For example, Burke (2005) stated,

“Through buildings, signs, and the landscape of the campus, the physical environment communicates messages that influence students’ feeling of well-being, belonging, and identity” (Burke, 2005, p. 106). These should put students in a better frame of mind to learn. Learning is “a comprehensive, holistic, transformative activity that integrates academic learning and student development, processes that have often been considered separate, and even independent of each other (Keeling, Dungy, American College Personnel Association., & National Association Of Student Personnel Administrators (U.S.), 2004).

The process of learning equips students with a way of interacting with the world, and they create knowledge by the way they approach their learning (Biggs, 2003), but there is little in the literature about how students’ learning is affected by how they feel about their place within their institution. It seems plausible that among the many influences on students’ outcomes, the physical environment is one of them, even if such influence is only modest. The argument is that the physical environment helps to set standards and helps to create more effective social grouping, or social capital formation, which leads to improvement of learning (Strange & Banning, 2001a). It does not appear that there are any empirical studies that relate the physical environment, social capitals and learning.

### **Trends in the Design of Learning Spaces**

Classrooms and libraries have been featured more prominently in the literature on learning spaces than any other kind of learning environments. In traditional campus planning, libraries have typically occupied prominent locations or sites on college campuses in the United States. Many have predicted that the growth in online services would lead to decreased demand for physical libraries, but this has not been the case to date (Temple, 2008). There is evidence, however, that traditional libraries are changing to align with new approaches to learning

(Lombardi & Wall, 2006; Stewart, 2010). It is also suggested in the literature that, while advances in science and technology have led to smaller but more powerful equipment for laboratories leading to more productivity per unit of space, the demand for laboratory space has not decreased (Barnett & Temple, 2006, p. 14). This is similar to the trend in other kinds of spaces such as art studios. In remodeling existing learning spaces, the trend is to strive for flexibility in design.

In general, new spaces are being designed to incorporate spaces for social interaction, in addition to its expressed functional requirement. Providing “places for reflection” in an atrium, or creating an internal “street” linking related spaces is one way to support social interaction in new or renovated buildings (Edwards, 2000, p. 100). Another trend that is emerging in new learning spaces is the introduction of food, such as a café, and semi-private meeting spaces to increase the likelihood of chance meetings and the exchange of ideas (Edwards, 2000). Laboratory designs are moving more towards open-plans, with shared facilities instead of separate laboratories for different teams (Gutman, 2004).

### **The Need for Change**

Much of the discussion in the literature regarding student-centered design has been directed primarily toward curriculum and pedagogy, with little or no attention to the impact of the physical environment. Changes in demographics and approaches to teaching and learning suggest the need to rethink approaches to campus design; teaching and learning should drive design, not the other way around (Jamieson, 2003; Jamieson, Fisher, Gilding, Taylor, & Trevitt, 2000; Temple, 2008). But, what is the precise nature of the new learning spaces that align with new ideas in teaching and learning? Not much convincing evidence has been presented in past studies to address this question. In classroom environments, there, however, is acknowledgement

that large lectures will continue to be delivered in “sage on stage” layout format; but students and faculty prefer convenient and flexible furniture layout, comfortable seating, temperature control, and pleasant outside views (Brock et al., 2006; Scott-Webber, 2004).

It is not conceivable that any university could afford to re-configure its entire campus at once, but planned renovations and new construction provide the opportunities to introduce new ideas in designing learning spaces. Ideas on how to design new learning spaces, mostly classrooms, abound (Bickford, 2002; Butz, 2002; Chickering & Schlossberg, 2002; Chism, 2006; Dittoe, 2002; Graetz & Goliber, 2002; Hughes, 2002). While looking at the big picture is key to successful design, it is also important to pay attention to details when designing both new learning spaces or re-configuring existing ones.

The proxemics associated with seating arrangements in a lounge area in a student center can either promote or inhibit social interaction. The physical artifact messages of support or non-support can take many forms, signaling a sense of belonging, a feeling of being welcomed, a sense of safety, and a sense of role, worth and value (Banning & Bartels, 1993). Such messages enhance or detract from students’ ability to cope with college stress” (Strange & Banning, 2001a, p. 31).

Design should aid students’ ability to learn (Kenney, Dumont, & Kenney, 2005; Temple, 2008). Designing campus facilities intentionally for learning starts by recognizing that they must be fit for the purpose they are intended to serve. Designers must understand the purpose of the facilities and the learning outcomes that colleges expect before they can design it successfully. Such designers must rely on a larger body of knowledge that architects would not typically have, and also adopt a much more interdisciplinary approach in their work.



First, design teams should work collaboratively with students, faculty, student affairs staff and administrators to define and refine the design problem (Bickford, 2002; Butz, 2002). This allows the project to benefit from the collective knowledge of the frontline people as well as key stakeholders, and pushes everyone involved to stretch beyond their comfort zone. Involving students allows designers to understand the student perspective and to create a more student-friendly built environment.

Developing the kinds of campus places that students really want should start by engaging students; all campus community should provide input to designers in order to determine how the spaces can best meet student needs. Coomes and DeBard (2004) stated that there were four distinct generations on college campuses: the silents (born between 1925 and 1942), boomers (born between 1943 and 1960), Gen-X'ers (born between 1961 and 1981), and millenials (born between 1982 and 2002). If one or two of these groups are making all the design decisions for everyone else, they are likely to overlook important considerations that may not have been important to their own generation.

Second, designers should seek to intentionally understand the linkage between learning theories and design theories, and to align their design perspectives with successful learning models. For instance, consider the epistemological concept called constructivism. It addresses how humans construct knowledge and meaning from their experience, and it “assumes that meaning emerges from inquiry, knowledge acquisition, and the relationships and conversations among people who learn. It also acknowledges that individual perspective and life experience shape each person’s interpretation of information” (Fried, 2006, p. 4). When constructivism is the basis for determining the function that a learning space will serve, then the designer would find architectural probabilism to be a more suitable approach to determining the most appropriate

form. In other words, the constructivist approach requires flexible and changeable space that can accommodate individual differences in learning styles and different learning scenarios.

Third, it is important to benchmark similar facilities and set goals for the planned facility. If a facility is truly on the cutting edge, similar facilities may not exist. Documenting what does exist and setting goals makes it possible for institutions to objectively measure their success. The lessons learned through such a process help to improve future designs for learning spaces. Clearly, the intent here is not to measure learning outcomes; that is a more complex undertaking. It is, however, possible to measure how well a facility meets its goals based on certain learning objectives that it is designed to foster. For example, if it is determined that social interaction among members of a learning community is important, then a facility can be designed to encourage chance encounters, with furniture arranged to encourage collaboration. Food and other “draws” can be incorporated to increase the likelihood that people will encounter each other and interact outside of formal classes.

Finally, designs for learning spaces should be based on continuous research. Each facility should also serve as a living laboratory that allows data gathering. The changeability of the facility should then make it easy to continuously change to accommodate new lessons learned. The design of learning spaces should be dynamic and on-going, like living systems. New information can always be incorporated to keep pace with new ideas about learning. As technology changes and new knowledge is gained about building technology and sustainable practices, the learning space should transform to reflect such changes. The physical environment should promote experiential learning through visible alignment of learning theories with design theories, and intentionally impregnating the entire facility with symbolic meaning.

A new initiative for health sciences majors at the University of Minnesota-Rochester illustrates how institutions can design a learning system that defines a function around which designers can create their physical form; so that the function will inform the form. This provides an enviable location for academics, “Almost everyone in academe daydreams of scrapping the conventional university model and building something from scratch, but few people actually get the chance to try it” (Glenn, 2009, p. A1). The University of Minnesota-Rochester had that chance. Campus leaders wanted to develop coordinated curriculum that provided incentives to faculty to focus on what students were really learning.

For a start, faculty developed a unified curriculum that required students to take the same sequence of courses for their first two years of undergraduate education. Learning was to be interdisciplinary and designed around specific topics or issues. As an example, students may learn about transplants in biology, sociology and bioethics, simultaneously.

The program organizes faculty under a single academic unit, regardless of their disciplinary backgrounds. Faculty members receive added compensation or incentives for conducting research on their own students’ learning and for continually improving their instruction to maximize student learning.

This program is also designed to collect data about student performance and to analyze that data in new ways. The elaborate database being built helps them track the success or failure of the various instructional techniques used. They want to be able to assess their students’ ability to combine different kinds of knowledge; this would, in turn, help them to continuously improve their program.

Finally, the classrooms and laboratories are located within a space carved out of what was formerly a food court on the top floor of a downtown shopping arcade. Students going to

class take the escalator through the mall and run into patients and their family members from the nearby Mayo clinic. Whether or not the physical setting for the program was intentionally chosen and designed is not clear. The point here is to emphasize the need for such decisions about facilities to follow the academic plan, and be reviewed as often as the teaching and learning models change.

There is an on-going paradigm shift from teacher-centered to learner-centered epistemology. Building new facilities and renovating existing ones are intended to serve students' learning needs, but these facilities are not keeping pace with the evolving models for learning. Therefore, the design of the physical campus environment should mirror the transformation that is taking place in higher education's approach to teaching and learning. It is time for a new approach to campus design that recognizes learning differences, the multiplicity of learning styles, and the impact of the social context of learning. This approach responds to constructivism with architectural probabilism. It is also an approach that brings faculty, student affairs staff, administrators, students, and designers together as equal partners to create successful learning environments or communities. Moreover, it provides students a great opportunity for project-based learning about the inter-relatedness of issues in higher education.

### **Research on Learning Spaces**

The evidence for the role of campus design and the design of individual buildings in supporting students' learning is very limited. Viewed as a social activity, learning can be enhanced by creating the kind of physical environment that fosters social interaction; designing flexible, welcoming, informal campus spaces where people can meet, eat, talk or meet in small groups can help to create the appropriate forum for intellectual and social exchange. There is a suggestion that providing 'socially catalytic' 'third places', which are neither home nor work, but

places place to 'hang out', helps students to form and deepen social bonds, and enhances learning (Strange & Banning, 2001a, pp. 145-146). There is little justification in the formal literature for the claim that excellent design can enrich learning experience, raise the aspirations of faculty and students, and make learning stimulating (Barnett & Temple, 2006; Joint Information Systems Committee. & Higher Education Funding Council for England., 2006)

The value of well-designed buildings to the institutions has been explored by informal surveys. The results have not always been conclusive. A British study by the Commission for Architecture and the Built Environment (2005) was conducted to determine the perceived impact of new building on staff and student performance. It found that faculty and staff appreciated well-designed buildings more than students. According to the respondents, there were three factors that were responsible for their improved performance: these new facilities helped to motivate students in their work, helped to inspire them, and provided them the appropriate facilities for their course content. While it is easy to see how new facilities could be better configured for delivering appropriate course content, it is difficult to determine how these buildings motivated and inspired students. What specific features of the buildings provided these benefits? Another difficulty was that most of the studies have relied solely on student perceptions, without any measurable performance matrix or convincing research design.

Much of the available scholarship on the impact of physical environment on learning has followed defined disciplinary boundaries; whereas, what is needed is an interdisciplinary approach. The campus ecology approach would represent such an approach. Campus ecology is concerned with the transactions between the student and the campus (Banning & Kaiser, 1974). However, it is hard to find a direct, measurable and quantifiable connection between the physical

environment and learning outcomes because there are so many other mediating variables. The empirical measurement of learning outcomes is also an issue.

Another issue regarding research on learning spaces is that it difficult to empirically relate the non-formal and informal learning spaces with learning outcomes; yet, this is a very important area given how much time students spend outside formal classes. And finally, what role, if any, does beauty play in the learning environment? While there is evidence that thermal comfort, good lighting, and a safe environment are important, it is not clear that the beauty of the campus has an impact on persistence, retention and graduation or what students actually learn. Many campuses pay a premium to build aesthetically pleasing buildings and campus places, and it would be important to know if this is a good use of resources. These are but a few of the issues that a researcher in this area confronts.

### **Campus Design and Sense of Place**

Campus design and master plans afford colleges and universities the opportunity to communicate institutional priorities in physical form through the way in which they plan and design their campuses and individual buildings (Dober, 2003; Edwards, 2000). Campus means “a field” in Latin; it was used to describe the expansive green space that was a key feature on American colleges or universities. Over time it became “a piece of land that was covered with buildings of an American University” (Turner, 1987, p. 4). Today, the word “campus” represents more than the physical entity; it also connotes the pervasive spirit of a school, or *genius loci*, that is embodied in its buildings and grounds (Turner, 1987). Therefore, “campus sums up the distinctive physical qualities of the American College, but also its integrity as a self-contained community and its architectural expression of educational and social ideals” (Turner, 1987, p. 4).

The American college campus has always been intentionally designed to capture this genius loci, where “design is the production of figural schemes drawn on paper or computer that, through many different iterations, ultimately become built environments”(Groat & Wang, 2002, p. 82). And campus design is the process of planning and shaping the physical environment of college campus to give it form, context, meaning and delight (Dober, 2003, p. 3).

Spaces for teaching and learning, however, have not always been front and center in campus design. Writing about British universities, Edwards suggested that twentieth-century campus design reflected a struggle between “place making and the expression of rational, technologically pure architecture” (Edwards, 2000, p. 37), rather than the different views about teaching and learning (Temple, 2008). In analyzing the American campus, the same can be said about American universities (Whisnant, 1979). Campus design may be viewed as a metaphor for an educational worldview; and the current spatial organization of the average American campus works against the best interests of the academic community. Specifically, Whisnant (1979) questioned how the organization of space on campus affects learning, and suggested that campuses are designed in a way that magnifies rivalries between departments; this, in turn, would result in a sense of alienation, strife, division, and tension.

The natural and built physical environment of the campus shapes behavior by permitting certain kinds of activities while limiting or making others impossible. Moreover, students’ commitment, in terms of persistence and loyalty to the institution, can be strengthened by intentionally creating a strong “sense of place” through connecting campus architecture and design to meaningful experiences and memories of activities (Kuh et al., 2005).

## **Sense of Place**

Sense of place "typically refers to an emotional bonding to a particular geographic place" (Bott et al., 2006). Sense of place is the "meaning and importance of a setting held by an individual or group, based on an individual's and group's experience with the setting" (Stedman, 2003b, p. 822). Literature on sense of place is vast, complex and crosses many disciplinary boundaries (Bott, 2006; Stedman, 2003b, p. 823). There are, however, common themes that pervade the research literature; they include relationships between place and variables such as space, meaning, experience, physical environment (natural or built), and social relationships. An exploration of the concept of place and common place themes in the literature, aid a better understanding of the sense of place construct. According to Stegner (1986):

...a place is not a place until people have been born in it, grown up in it, lived in it, known it, died in it -- have both experienced and shaped it, as individuals, families, neighborhoods, and communities, over more than one generation. Some are born in their place, some find their place, some realize after long searching that the place they left is the one they have been searching for. But whatever their relationship to it, it is made a place by slow accrual, like a coral reef (p. 3).

This view expressed by Stegner captures some of the essential elements of the definition of sense of place in the literature. In essence, place is only produced through the union of a geographic location and humans (Stedman, 2003b); this is central to most definitions of sense of place.



## Understanding Sense of Place

The definition of "place" precedes that of "sense of place." Place has been defined in the research literature in terms of its relationship to space. Space and place may be viewed as opposite ends of a continuum (Tuan, 2001). Tuan (1977, p. 6) further stated:

What begins as undifferentiated space becomes place as we get to know it better and endow it with value....The ideas 'space' and 'place' require each other for definition.

From the security and stability of place we are aware of the openness, freedom, and threat of space, and vice versa. Furthermore, if we think of space as that which allows movement, then place is pause, each pause in movement makes it possible for locations to be transformed into place.

Space is transformed into place through personal experience, "If space is abstract and universal, place is particularistic and imbued with meaning by virtue of the experiences we have had there" (Stedman, 2003b, p. 823). Tuan (2001) posited that the only thing significant about an abstract space is its strangeness, until it becomes a concrete place as it is filled with meaning. So, a place is a space that people have made meaningful (Cresswell, 2004). Cresswell (2004) goes on to define place as a "meaningful location" (p. 7). Taun (1979) wrote:

Place may be said to have 'spirit' or 'personality', but only human beings can have a sense of place when they apply their moral and aesthetic discernment to sites and locations. Modern man, it is often claimed, has lost this sensitivity. He transgresses against the genius loci because he fails to recognize it; and he fails to recognize it because the blandness of much of modern environment combined with the ethos of human dominance has stunned the cultivation of place awareness (p. 410).

To sense a place is to know it through sight, hearing, touch, smell and taste. Hence, sense of place has two meanings; one meaning deals with the visual or aesthetic aspect, while the other has to do with the other four senses (Tuan, 1979). According to Tuan (1979), "The eye needs to be trained so that it can discern beauty where it exists; on the other hand beautiful places need to be created to please the eye" (Tuan, 1979, p. 410). So, "places are locations that have visual impact" (Tuan, 1979, p. 410). While beauty, or the aesthetic qualities of a location, can be appreciated immediately, senses of hearing, touch, taste, and smell would require a person to have close interaction with an environment over a long time in order to know it (Tuan, 1979).

There is a connection in the research literature between sense of place, meaning and experience. Lynch posited that every place has its own identity that makes it distinct from other places; this identity will, however, vary from person to person (Lynch, 1960). People's thoughts and feelings (i.e., cognition and emotion) inform their sense of place. Humans ascribe meanings to places, and in turn, become attached to these meanings.

These meanings vary from person to person, just as individual thoughts and feelings about a place vary. This explains why the identity of a place varies from person to person (Stedman, 2003b). This is consistent with the notion that there are as many different meanings to a place as there are people (Relph, 1976). On the other hand, there are those who suggest that while a place has multiple meanings, these meanings are grouped by social categories to which individuals belong; therefore, the meanings that individuals ascribe to a place are limited by the number of social categories there are (Greider & Garkovich, 1994). While there have been some suggestions that places have meanings that are independent of human experience, the predominant thought in place literature is that meanings are derived through experience with a

geographic location; common meanings will result from similar experiences (Greider & Garkovich, 1994; Stedman, 2003b).

Another important theme in the literature is the contribution of the physical environment to sense of place. Much of the sense of place research has emphasized its social construction (Eisenhauer, Krannich, & Blahna, 2000; Greider & Garkovich, 1994), and paid little attention to the contribution of the physical environment (Stedman, 2003a). According to Relph (1976), people make places and the appearance or landscapes are of little importance. There are, however, those who suggest that there are attributes of the physical setting that contribute significantly to place meanings and attachment. When people interact with the physical environment, for example, the physical space becomes the object of attachment (Kyle, Graefe, & Manning, 2005). Any physical feature of an environment such as landscapes, art objects, towns, cities, buildings, can become the object of such attachment (Cresswell, 2004). Similarly, Norberg-Schulz (1985) suggested that the physical attributes of a space facilitate habitation by users, and lead to development of attachment. A degree of attachment to a place can be developed quickly through visual appreciation of the characteristics of a setting (Tuan, 2001).

The concept of sense of place in the research literature has also been referred to as place attachment, topophilia, insideness, and community sentiment (Cross, 2001; Low & Altman, 1992a). The many definitions of sense of place represent various disciplinary perspectives. In environmental psychology, Steele (1981) defined sense of place as "an experience created by a setting combined with what a person brings to it" (p. 9). He suggested that certain places have such strong "spirit of place" that they tend to affect many different people in a similar manner. By spirit of place, he meant the unique and distinctive characteristics of a location that makes it

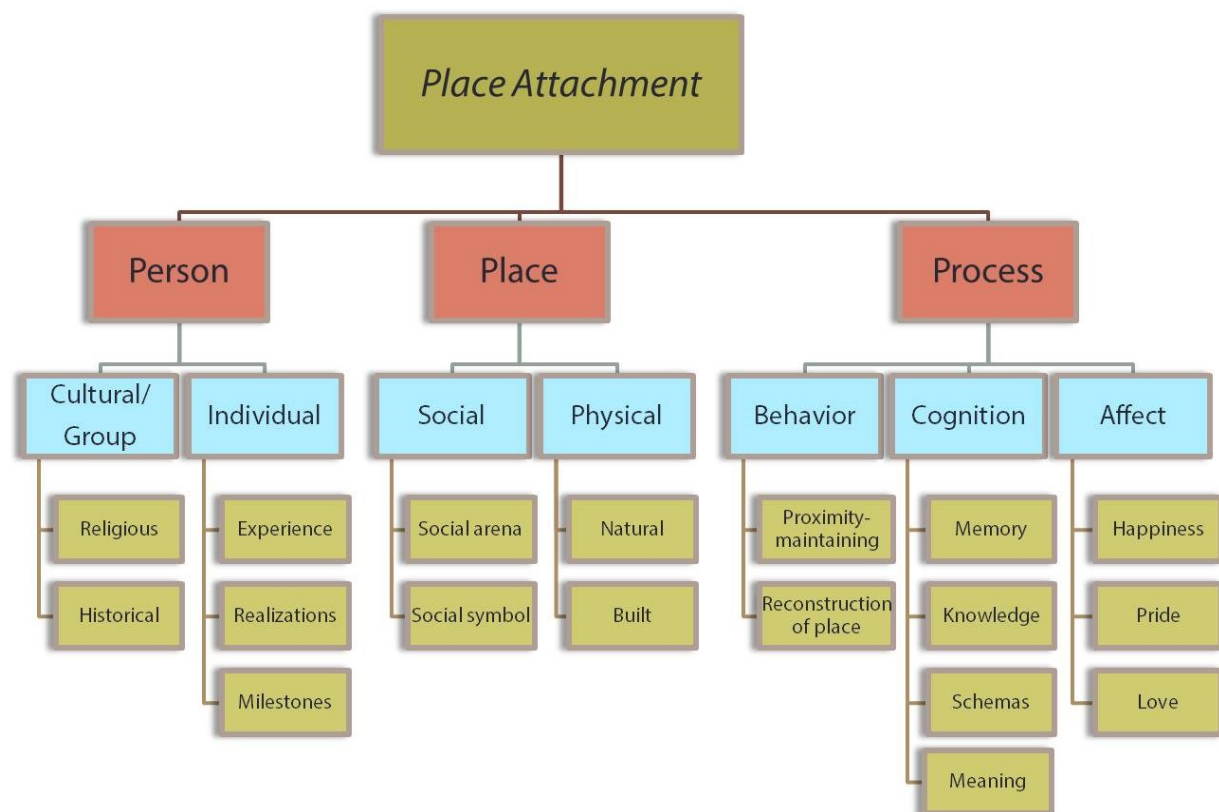
special or gives it a unique personality, whereas a setting describes a person's immediate social and physical surroundings.

In geography, Tuan popularized the term *Topophilia* which means the love or affective bond that exists between people and place (Cross, 2001; Tuan, 1990). Hummon, on the other hand, discussed sense of place from a sociological view point (Hummon, 1992). He defined sense of place as the subjective perception and feeling that people have about their environment. The concept of place attachment has been used to mean the psychological bonding between person and environment (Proshansky, Fabian, & Kaminoff, 1983a). Low(1992b), introduced an anthropological dimension by defining place attachment as the symbolic relationship that exists among people who give common culturally-derived emotional or affective meanings to a particular location that represents a shared culture. Although it is difficult to find one common definition for the concept of sense of place, in this study, the concept refers to the emotional bond that exists between a person or group and a geographic location (Bott et al., 2006).

### **Theoretical Model for Sense of Place Research**

This section presents the theoretical models for sense of place in the research literature. The review covers various theories of place presented in both classic and more recent studies, as well as attachment theory. John Bowlby, a British psychoanalyst, first developed attachment theory in 1958. Attachment is a deep and lasting bond that exists between one person and another across time and space. The tripartite conceptual organizing framework (person-process-place), proposed by Scannell and Gifford (2010a), was adopted for this review of the relevant theories (see Figure 2.6 for a visual representation of this model). In this three-dimensional framework (person-process-place), the person dimension of place attachment refers to place meanings that are derived individually or collectively. The focus is on the actor, or who is

attached, and the extent of the attachment. The process dimension refers to the psychological processes by which attachment to place occurs and includes affective, cognitive and behavioral aspects of attachment. The place dimension “emphasizes the place characteristics of attachment, including spatial level, specificity, and the prominence of social or physical elements (Scannell & Gifford, 2010a, p. 1).



*Figure 2.6. The Tripartite Model of Place Attachment (Scannell & Gifford, 2010a)*

**The person dimension.** Place attachment literature has emphasized the person dimension more than the place dimension, and has largely ignored the process by which attachment occurs

(Lewicka, 2011). Many studies have focused on people in this person-place bond and have shown that attachment occurs at the individual and group levels (Lewicka, 2011; Scannell & Gifford, 2010a), but research has emphasized the role of individual differences in place attachment (Lewicka, 2011).

The connection that develops between a person and a geographic location, through important personal experience, makes that location meaningful. Hence, an individual becomes attached to this meaningful place because it is, for instance, where he or she first fell in love (Manzo, 2005). Research suggests that attachment to places that trigger personal memories are strong and contribute to a stable sense of self (Twigger-Ross & Uzzell, 1996). A space that is abstract and unfamiliar becomes a concrete place, imbued with meaning through human experience (Tuan, 1974, 1977). The more experience one accumulates in a place, the stronger one's sense of place or attachment to the place becomes (Relph, 1976). The suggestion here is that the longer one stays in a place or the greater the interaction, the more experience one accumulates, leading to stronger sentiments about the place.

A group of people may also be collectively attached to a place because of the symbolic meaning they ascribe to that place (Low & Altman, 1992b). Such shared attachment may arise because of the cultural significance of a place to the group or community (Mazumdar, Mazumdar, Docuyan, & McLaughlin, 2000), or from shared religious beliefs (Mazumdar & Mazumdar, 2004). People who have similar experiences of a place, such as the use of a landscape in a similar way, will have some shared meanings of that place (Greider & Garkovich, 1994).

In addition to the categorization into individual or group attachment to place, most studies that emphasized the person dimension have utilized either a quantitative or qualitative

research design. Studies that assess individual differences compared people on a set of quantitative variables or dimensions, such as strength or type of attachment to place, whereas qualitative studies grouped people by typologies based on their place sentiments (Lewicka, 2011). Research that identifies these various typologies include works by Relph (1976), Rowles (1990), Shamai (1991), Hummon (1992) and others.

Relph (1976) identified seven stages of what he termed *insideness*. Relph suggested that if a person feels inside a place, he or she would rather want to be there as opposed to when she or he feels outside of it. This feeling of being inside a place makes a person feel safe rather than threatened, or enclosed rather than exposed. He further suggested that the more one feels inside a place, the more one identifies with that place. The identity of a place, to which one may feel a part of, comes from its “persistent sameness and unity which allows it to be differentiated from all others” (Relph, 1976, p. 45). The polar ends of this concept of *insideness* are *existential insideness* (immersion in the place) and *existential outsideness* (alienation). Similarly, Shamai (1991) developed three levels of sense of place based on Relph’s typology; these levels are: belongingness (weakest level), place attachment (middle level), and place commitment (highest level). In a study of elderly residents in a rural community that explored the phenomenon of place attachment and its relationship to their well-being, Rowles (1990) also identified three types of insideness, namely: physical (based on familiarity with the physical environment), social (based on familiarity with the people), and autobiographical (through personal memories).

Similarly, McHugh and Mings (1996) studied seasonal migrants, such as retirees who move back and forth annually between their winter and summer homes, and found three types: still-rooted in home place, suspended between dual homes, and footloose. They suggested that each type understood time differently as circular, pendular, or linear, respectively. They counter

the common assumption in the literature that upon retirement elders age in place or move to another community. They suggest instead that seasonal migration among elders should be viewed as circular rather than linear, in terms of origin-destination. This circle involves separation from home and the ensuing journey, the experience of a new place and the associated place-making, and the return to home which is temporal and signifies loss of ties. Those that are still rooted in home place migrate seasonally between home place and winter home, but have stronger attachment to the home place. When circumstances change, such as declining health or death of a spouse, they settle in their home place. This completes the circle.

For the suspended types, they drift from home during young adulthood and middle age, and migrate seasonally between summer and winter home. They are equally attached to these two homes so they are suspended between dual homes. Changing circumstances lead the suspended types to settle either in their summer home or winter home, hence their space-time path is pendular. The footloose types break from home because of career, family travel or migration of children; their travel includes seasonal migration to winter residence and when circumstances change they settle where their journey ends or close to their children. Their space-time path is linear.

Hummon (1992), in a study of community sentiment, suggested that there exists five types of people based on their sense of place, linked to five different senses of community. These categories are: rootedness (everyday rootedness and ideological rootedness), alienated, relativity (place relative), and placeless. The rootedness represents attached individuals, while the other categories represent non-attached persons. Hay (1998) also identified five types of sense of place based on the strength of rootedness to a place; these categories are: cultural, ancestral, personal, partial, and superficial (weakest).



Others have also suggested typologies based on the symbolic meanings that people attach to places. Low (1992b), for instance, posited that the symbolic meanings that people ascribe to places, whether religious, ancestral, cultural or others, determines the type of place attachment. Similarly, Mazumdar and Mazumdar (1993) suggested that secular and sacred place attachment are different, and further divided sacred place attachment into attachment to landscapes, cities, and sacred architecture. The typologies are all different because these are qualitative studies, and cannot be generalized. Quantitative studies would lend themselves more easily to wider application.

**The place dimension.** Place is the object of the attachment, but this has received less attention in the literature than people (Lewicka, 2011). Droseltis and Vignoles (2010) suggested focusing on differences between places rather than people. Studies have examined place at varying geographic scales, ranging from a room within a house, to a neighborhood, city, country, or the world (Cuba & Hummon, 1993; Low & Altman, 1992c). Place consists of both physical (natural and built) and social (social arena and social symbols) dimensions (Riger & Lavrakas, 1981; Scannell & Gifford, 2010a).

In a study conducted in Spain, Hidalgo and Hernandez (2001) explored place attachment within three spatial scales (home, neighborhood, and city), and two dimensions (physical and social) to establish a comparison. They interviewed 177 people from different areas of Santa Cruz de Tenerife and found that attachment to place developed to different degrees within different spatial ranges and dimensions. Their results indicated that attachment to neighborhood was the weakest (with stronger attachment at the home and city scales), and social attachment was greater than physical attachment. However, they stressed that physical and social

attachments both affect the person-place bond and should be considered when measuring such bond.

Riger and Lavrakas (1981) studied the connections between social ties and attachment to place, and identified social bonding and behavioral (physical) rootedness as two dimensions of community attachment. Social bonding was measured by the ability to identify neighbors, feeling a part of the neighborhood, and the number of neighborhood children that respondents knew. Rootedness (physical attachment) was measured by the length of residence, ownership and expected length of stay. Other studies have identified social and physical factors as contributing to place attachment or sense of place (Mazumdar & Mazumdar, 1993, 2004).

Much of the research on place has, however, often emphasized the role of social relationships within the setting as predictors of place attachment or sense of place. Those that consider place as a social construction include Eisenhauer, Krannich, and Blahna (2000), Greider and Garkovich (1994), and Relph (1976) who stated that "a place is essentially its people, and appearance or landscape are little more than a backdrop of relatively trivial importance" (p. 33). The view that the social relationships and group identity that a place facilitates are what causes attachment rather than its physical features is shared by many others, such as Fried (1966, 2000).

Some researchers, such as Hunter and Janowitz (1974), have claimed that attachment to place is developed when the socio-economic system stratifies people into homogeneous communities, within which interpersonal attachments and networks develop. There are those, such as Woldoff (2002), who interpret place attachment as attachment to the people and social interactions that the place affords, or that the attachment to a physical place is merely a symbol of the social bonds that exist within the place (Lalli, 1992). Such symbolic social bonds may include personal interactions with individuals within the setting or simply a connection to the

group that it represents (Scannell & Gifford, 2010a). When a person is attached to a location, and it is special to the person because it is a symbol of the group to which he or she belongs, then that place reflects the individual's self-identity which informs place identity (Twigger-Ross & Uzzell, 1996).

A number of studies have also addressed the physical dimension of sense of place or place attachment. Stedman (2003b) suggested that "space is never truly blank because the physical setting contributes important raw material to place meaning" (p. 823). To know a place is to sense it through sight, hearing, smell, feel, and touch, which is manifested by color, texture, quality of light, scents and sounds (Ryden, 1993). Researchers have divided sense of place into smaller subsets (Altman & Low, 1992; Low & Altman, 1992b; Proshansky, 1978; Stedman, 2003a; Stokols & Shumaker, 1981) including place dependence, which refers to the potential of a place to support an individual's goals, highlighting the physical characteristics of the place as central to attachment (Jorgensen & Stedman, 2006; Nanzer, 2004; Stokols & Shumaker, 1981). Proshanski, Fabian, and Kaminoff (1983b) identified the physical attributes of places as influencing an individual's self-concept. The physical settings to which individuals are attached vary widely in scale and types, including built and natural environments (Manzo, 2005). But, each place has an identity that makes it distinct from other places, and this identity will vary from person to person (Lynch, 1960).

**The process dimension.** The people dimension addresses the questions: who is attached, and to what extent? The place dimension addresses the object of the attachment. This section centers on how the attachment takes place. Jorgensen and Stedman (2001), and others, have identified affect, cognition and behavior (conation) as components of sense of place. Affect is

concerned with emotions; cognition is concerned with measures of intelligence; and conation (or behavior) deals with how individuals act on their feelings and thoughts.

*Affect.* Affect has been identified in the literature as a component of the process by which attachment to place develops. The bond between a person and place involves emotional connection (Cuba & Hummon, 1993; Fullilove, 1996; Giuliani, 2003; Hidalgo & Hernandez, 2001; Manzo, 2003, 2005). The word “topophilia” or “love of place” refers to the affective bond between people and place (Tuan, 1974). Some have suggested that Tuan coined the word “topophilia”, but there is evidence of its earlier use by others (Bachelard, 1964; Betjeman & Auden, 1947; Watts, 1973) to mean special love for peculiar places (Watts, 1973). Others have referred to this emotional component of sense of place.

This emotional bonding between people and places has been linked to attachment theory as a basis for the sense of place model. This theory, attributed to Bowlby (1958, 1969), suggests that an infant needs to develop a relationship with at least one adult caregiver in order for normal social and emotional development to occur later in life. The attitudes of trust, sense of security, and sense of self that one develops later in life has been found to depend on the attachments formed in infancy. This is consistent with Harlow’s (1961) study at the University of Wisconsin in which infant monkeys separated from their mothers at birth and given replacement mothers made of cloth or wireframe clung to the cloth mother rather than the wireframe one despite that the wireframe mother was equipped with milk. Adapting this theory to place studies, Morgan (2010) proposed a place attachment theory that suggests that a pattern of positively affected experiences of place in children translates into long-term positive affective bonding in adulthood. In other words, the idea that an individual's ability to enter into mature relationships in adult life depends on successful early attachment, also applies to an individual's attachment to place. Place

attachment in children has been shown to correlate strongly with exploration of outdoor places (Morgan, 2010).

According to this model, a secure child will explore new places but turn to the caregiver when frightened in order to be comforted and soothed. Lewicka (2011) concluded that “only persons who succeed in developing place attachment in early childhood will be able to develop emotional bonds with places in later stages of life” (p. 225).

*Cognition.* Another component of the process by which attachment to place develops, is the process by which knowledge and understanding is developed in the mind (Oxford Advanced Learners Dictionary). Person-place bonds also have a cognitive component (Lewicka, 2008, 2011; Scannell & Gifford, 2010a). Settings acquire importance because of the meanings, memories, and beliefs that people associate with them, as well as familiarity with such settings (Lewicka, 2008, 2011; Scannell & Gifford, 2010a; Stedman, 2003b). In explaining sense of place, Tuan (1979) suggested that to sense a place is to know it through the five senses. Hence, the process by which knowledge of a place is developed in an individual's mind requires familiarity with the place (Fullilove, 1996; Tuan, 2001). An abstract and strange space that lacks significance and meaning becomes meaningful through human experience (Tuan, 2001); and the more experience of a place one accumulates, the greater the sense of place or place attachment (Relph, 1976), suggesting that sense of place and place attachment depend on time. Tuan (1977), Relph (1976), and others, have hypothesized that the length of residence in a place is a potential predictor of sense of place, and have suggested that individuals who have lived longer in a place will likely develop greater social relationships and attachment to the physical attributes of the place than those who have spent less time.

In contrast, Stedman (2002), in a survey of residents of Vilas county, Wisconsin, found that length of residence was not a factor in predicting sense of place. The types of experiences and the way in which individuals interact with a setting contribute to the meanings they ascribe to it (Stedman, 2003b). Shared meanings ascribed to a setting by a group of people may result from shared experiences (Greider & Garkovich, 1994), or shared beliefs (Mazumdar & Mazumdar, 1993). Memory is another aspect of cognition through which sense of place is developed. People develop attachment to places where memorable events took place by ascribing meaning to those places; places may also become meaningful when an individual links them to memory of their childhood or some other memorable time in their past (Hay, 1998; Manzo, 2005; Twigger-Ross & Uzzell, 1996).

In addition to memory, knowledge, and meaning as cognitive processes for developing sense of place, a schemata or organized pattern of thought may be applied to the concept of sense of place to help elucidate the process of place attachment. Individuals may be attached to certain types or categories of place because "the schema contains information about the features common to the types of place to which one may become attached" (Scannell & Gifford, 2010a, p. 3). A "favorite place may be a kind of place schema of place-related knowledge and beliefs, which ultimately represents the special character of the place and one's personal connections to it. In turn, these cognitions can become incorporated into one's self-concept" (Scannell & Gifford, 2010a, p. 3). Attachment to place may occur when individuals see similarities between themselves and place, in such a way that the place is seen as a reflection of who they are or their self-identity; cognitions about the physical setting such as memories, preferences, thoughts, and values become part of their definition of self (Scannell & Gifford, 2010a). This connection

between a place and an individual's personal identity is what Proshansky (1978; 1983b) termed place identity.

*Behavior.* The third process by which attachment occurs, is expressed through actions, and consists of proximity-maintaining behavior and reconstruction of place (Scannell & Gifford, 2010a). Proximity-maintaining behavior is highlighted in research literature through length of residence in an area or time spent in a place. Length of time spent in a place may increase familiarity, leading to a growing sense of security (Gifford et al., 2009), and increased social relations, which are made stronger and deeper with the passage of time or because the place represents several life stages (Hay, 1998).

Religious pilgrimage is an example of proximity-maintaining behavior where an individual continues frequenting the object of their attachment (Mazumdar, 2005; Mazumdar & Mazumdar, 1993, 2004). For instance, Mecca and Jerusalem represent such places of pilgrimage for muslims and Christians respectively. This also extends to members of certain professions like architects who frequent sites of important architecture such as Rome and Athens. Homesickness has also been studied as indication of proximity-maintaining behavior where individuals seek to return to the home to which they are attached once they are away from it (McAndrew, 1998; Riemer, 2000; Scopelliti & Tiberio, 2010). Reconstruction of place is another behavior that is linked to the cognitive process of developing sense of place. For instance, when individuals relocate, whether forcibly or voluntarily, they tend to recreate or reconstruct the place they left or used to have. This may be accomplished by choosing a place that is similar to the place to which they are attached as a way to preserve the bond (Gans, 1967; Michelson, 1976).

## Measuring Sense of Place

Research into sense of place and place attachment has followed either qualitative or quantitative methodological traditions. Measuring person-place bond has not been easy, because such measurements depend on how definitions of sense of place and place attachment are unpacked and interpreted. Relevant studies are reviewed here based on whether the study followed qualitative or quantitative methods.

**Quantitative measure.** In early quantitative measurements, sense of place and place attachment were latent variables for which proxies were identified. A latent variable is the underlying phenomenon or construct that a scale is intended to reflect (DeVellis, 2012). Some of these early instruments employed proxies such as neighborhood ties, length of residence, and home ownership (Riger & Lavrakas, 1981). These proxies were based on the assumption that certain behaviors indicate attachment but provide no means of capturing the place-related emotions involved in person-place bonds (Lewicka, 2011).

Some instruments were developed to measure sense of place as a uni-dimensional construct focusing on whether or not sense of place exists and how strong it is (Hernández, Carmen Hidalgo, Salazar-Laplace, & Hess, 2007; Hidalgo & Hernandez, 2001; Lewicka, 2005). For instance, Williams, MacDonald, Riden, and Uysal (1995) and Shamai (1991) developed uni-dimensional scales based on the idea that sense of place could be understood as a continuum ranging from “objective outsidership” to “existential insidership”, as proposed by Relph (1976).

Multidimensional measures were also developed (Kyle et al., 2005; McAndrew, 1998; Scannell & Gifford, 2010b; Williams & Vaske, 2003). Among these multi-dimensional scales, there are differences in the type and number of dimensions identified (Giuliani, 2003; Lewicka, 2005, 2008, 2010, 2011). For instance, Kyle et al. (2005) developed a scale with place



dependence, place identity, and social bonding as subscales. Whereas, Jorgensen and Stedman (2001, 2006) presented place attachment, place identity, and place dependence as the scales of their three-dimensional instrument. In a study of place bonding, an affective and cognitive-based attachment to special resource settings, Hammitt, Backlund, and Bixler (2006) developed a 26-item scale to measure place bonding. Based on factor analysis of data from respondents ( $n = 203$ ), they developed the following five subscales: familiarity, belongingness, identity, dependence, and rootedness. Many other scales have been developed and discussed by Giuliani (2003) and Lewicka (2011), among many others.

One thing that makes the measurement of sense of place more challenging, aside from lack of agreement about dimensionality and what the dimensions are, is that theoretical relationships between concepts are neither clearly articulated nor consistent (Stedman, 2003b). Some of the instruments operationalized sense of place in terms that may not truly get at what it means, and others suggest that sense of place is synonymous with other constructs such as place attachment, rootedness, or sense of belonging. There is further confusion as to whether place attachment is the primary construct that encompasses other ideas, such as place identity and place dependence, or simply a dimension of other constructs, like sense of place (Lewicka, 2011).

Hernandez et al. (2007) distinguished place attachment from place identity in a study of natives and non-native dwellers of a Spanish Island. They found differences between intensity of attachment and identity depending on place of origin and place assessed. They also found that attachment and identity coincided with natives, while individuals from other places scored higher for attachment than for identity. Overall, Hernandez et al. (2007) and Knez (2005) found that place attachment develops before place identity. Williams and Vaske (2003) considered both

constructs synonymous, and Jorgensen and Stedman (2006) considered sense of place as the broader construct, consisting of place attachment, place identity and place dependence. According to Lewicka (2011), the relationship between these various constructs "depends a great deal on which items have been, a priori, considered diagnostic of particular constructs and included in particular subscale" (p. 220).

**Qualitative measure.** In addition to quantitative measures, qualitative studies of sense of place and place attachment abound. Quantitative measures tend to compare differences in the strength of person-place bonds, or focus on determining the components of specific constructs through factor analysis as well as the relationship between these sub-constructs (Jorgensen & Stedman, 2001, 2006) (Nanzer, 2004). Qualitative measures, on the other hand, "offer insight into the meanings that place entail" (Lewicka, 2011, p. 221). Since the current study is quantitative in nature, no further exploration of qualitative measures will be undertaken.

### **Summary and Critical Review of Literature**

Current understanding of student engagement as the cumulative time, efforts and resources both students and their institutions invest to enhance student learning and development (Trowler, 2010), represents the unification of two different perspectives that place responsibility for student engagement solely on either students or their institutions. Student engagement, as a phrase, began to appear prominently in the literature in the 1990s but the concept goes back more than 70 years starting with the "time on task" concept (Merwin, 1969), and subsequent concepts that built on it. These include Pace's (1979) "quality of effort" model and Astin's (1984) theory of involvement among others, which have formed the basis for the national survey of student engagement (NSSE) instrument.

The version of the NSSE instrument in use from 2000 through 2012 consists of five benchmarks for effective educational practices: academic challenge, active and collaborative learning, student-faculty interaction, enriching educational experiences, and supportive campus environment. Psychometric analyses of this instrument (Kuh, 2012) show alpha values of .85, .90 and .84 for groups of items assessing “college activities”, “educational and personal growth”, and “opinions about your school” respectively. Factor analysis of the “college activities” domain yielded four factors with 44.6% of the variance explained; “educational and personal growth” domain yielded three with 57.3% of the variance explained; and “opinions about your school” yielded three factors with 61.3% of the variance explained.

Whereas the instrument’s items changed little, these three domains were not aligned with the five benchmarks. This suggests that the five benchmarks need not be taken as the units of analyses when examining the construct validity of the instrument. LaNasa, Cabrera and Trangsrud (2009) proposed an 8-factor model as a better fit for student engagement construct based on exploratory and confirmatory factor analysis. They found that “the pattern of goodness fit indicators provided reasonable support for the hypothesized five factor structure, and the resulting measurement model obtained the following  $\chi^2/df > 2.1$ , TLI/NNFI and CFI  $< 0.95$ , and RMSEA  $> 0.057$ ” (LaNasa et al., 2009, p. 323), and  $p < 0.001$  for their particular study. They concluded that while the model fit statistics were reasonably acceptable, there were measurement and inter-correlations problems with the 5-benchmark model based on item level inspections. Also, alpha values for these benchmarks ranged from 0.59 to 0.787 with two of the five reliability indices considered too low to be reliable. The idea that the benchmarks should not be treated as factors was supported by Pike (2006) in proposing the use of “scalets”.

Student engagement has been highlighted in the literature as an important predictor of learning outcomes, persistence and student development. Kuh, Cruce, Shoup and Kinzi found that “student engagement in educationally purposeful activities had a small but statistically significant effect on first-year grades” (p. 547). Based on the results of OLS regression of first year GPA on student background and first-year experience, they found that engagement in educationally purposeful activities was significant ( $p < .001$ ,  $B = .038$ ), meaning that an increase of one standard deviation in “engagement score” during first-year of college increased students’ GPA by approximately 0.04 points. Also, engagement was found to have a statistically significant effect on persistence to second year even after controlling for background characteristics, other college experiences during the first year, academic achievement and financial aid. Results of logistic regression for persistence to the second year on student characteristics and engagement show that for the model, engagement in educationally purposeful activities yielded ( $B = .154$ ,  $p < 0.001$ ) and predicted probability of persisting to the second year was .912 when engagement score was one standard deviation above the mean. Other studies support these findings.

Similarly, sense of place has been difficult to define but generally refers to the emotional bonding that exists between individuals and a geographic location. The key issues with sense of place research with respect to this study relate to its dimensionality and what these dimensions are. There were studies that characterized sense of place as a unidimensional construct. For instance, a unidimensional scale for measurement of neighborhood attachment (Bonaiuto, Aiello, Perugini, Bonnes, & Ercolani, 1999) was derived from principal component analysis with all 6 items referring to degree of attachment to neighborhood lived in, loaded on one factor (59.2% explained variance,  $\alpha = .86$ ).

In a similar fashion, Hidalgo and Hernandez (2001) developed a unidimensional scale to measure place attachment within three spatial ranges (house, neighborhood, and city) with items that related to both the social and physical aspects of attachment. Whereas they referred to these two aspects as social dimension and physical dimension of attachment, no evidence was provided that these were factors extracted through statistical analysis; hence the scale is truly one-dimensional.

The questionnaire consisted of 9 items based on the same statement directed at three aspects of each of the three spatial ranges. For assessing general attachment to the house, the statement was “I would be sorry to move out of my house without the people I live with.” To assess social assessment to house, the statement was, “I would be sorry if the people I lived with move out without me.” And to assess physical attachment to house, the statement was “I would be sorry if I and the people I lived with moved out.” Similar statements were included for the neighborhood and the city.

The internal consistency of the scale was determined by computing Cronbach’s alpha (reported  $\alpha = .85$ ) for the scale as a whole indicating a high degree of reliability. Cronbach’s alpha were also computed for house attachment, neighborhood attachment and city attachment were reported to be 0.70, indicating acceptable reliability. Based on interviewing 177 people, and an analysis of variance on the three scores, the study found significant differences between the three ranges ( $F(2,350) = 3.69; p < 0.001$ ). In general, they found that there was no statistically significant difference between attachment to house and attachment to city; but attachment to neighborhood was less than both. This finding may be of interest in studying attachment on college campus, especially in exploring whether such relationships existing among spatial ranges

on a campus. This may be of particular significance for large campuses that are comparable in size to some small cities.

Other unidimensional approaches to assessing sense of place include Hay's (1998) scale for measuring the intensity of sense of place comprising four equally weighted variables (Cronbach's  $\alpha = 0.70$ ), where scale was assumed to be one dimensional without statistical evidence; and Burdge and Ludtke's (1972) 12-item instrument to measure individuals' affective attachment to their residential area based on Likert-type items designed around 'identification of with place' (Cronbach's  $\alpha = 0.99$ ).

In contrast, there were studies that found place attachment or sense of place to be multi-dimensional. The issue with some of these studies is the lack of agreement on the number of dimensions and what they really are. For instance, McAndrew (1998) developed a 10-item questionnaire for measuring 'rootedness' and the prediction of attachment to home-towns using a sample of 134 undergraduate students at a large state university, and cross-validated it with a sample of 126 undergraduates drawn from two other institutions. He equated 'rootedness' with an affective interpretation of place attachment, and assumed that it had negative and positive components corresponding to endpoints of a general bipolar concept.

By performing factor analysis of a priori scale and suppressing items with factor loadings less than 0.50, two factors emerged: desire for home subscale (6 items), and home/family satisfaction subscale (4 items) with internal consistency reliability coefficients, Cronbach's alpha equal to 0.56 and 0.51 respectively. While these values are not likely due to chance, they are below acceptable coefficients of .70 (Morgan, Leech, Gloeckner, & Barret, 2011). McAndrew's use of orthogonal rotation in performing principal component analysis meant that the two

dimensions of 'rootedness' were not correlated. Cronbach's alpha for the positive and negative subscales were 0.79 and 0.70, respectively.

Williams et al (1992) employed a multidimensional approach by conceptualizing place attachment as the domain with place identity and place dependence as subdomains. Using a 13-item instrument, respondents were asked to rate their agreement with statements like, "This place means a lot to me". They did not report correlation values between place dependence and place identity, but reported overall scale reliability (Cronbach's  $\alpha = 0.93$ ). In another study that appears to be an attempt to duplicate or validate Williams et al's (1992) study, Moore and Graefe (1994) identified two factors, based on principal components analysis, that showed high cross loadings and inter-scale correlation of 0.62 suggesting that both subscales overlap considerably at the empirical level. These scales were described as place dependence (how well the place enables goal achievement) and place identify (reflection of symbolic values of the place).

In other studies, Kyle et al (2005) developed a 12-item instrument consisting of three subscales: place identity (4 items,  $\alpha = .87$ ), place dependence (4 items,  $\alpha = .86$ ) and social bonding (4 items,  $\alpha = .62$ ); Williams and Vaske (2003) found two dimensions of place attachment (place identity and place dependence) through confirmatory factor analysis, each with 6 items and Cronbach's alpha values ranging from .81 to .94 for the seven locations studied.

Hammitt, et al (2006), on the other hand, proposed five dimensions of place bonding by performing confirmatory factor analysis on a priori 26-item scale and retained 24 items. Internal consistency reliability analysis of the five subscales were done yielding: familiarity (4 items,  $\alpha = .90$ ); place belonging (5 items,  $\alpha = .87$ ); place identity (6 items,  $\alpha = .92$ ); place dependence (6 items,  $\alpha = .88$ ); place rootedness (5 items,  $\alpha = .78$ ).

Lalli's (1992) 20-item Urban Identity Scale, administered to residents of Heidelberg, consisted of five subscales of urban-related identity: Evaluation, Familiarity, Attachment, Continuity, and Commitment. Evaluation subscale referred to comparison of the uniqueness of the town relative to other towns (e.g., There are many things here which are envied by other towns). Familiarity deals with knowledge of the place that is grounded in everyday experience (e.g., When I amble through Heidelberg, I feel strongly that I belong here). Attachment referred to the general feeling of belonging measured with items such as: 'I feel really at home at Heidelberg'. Continuity subscale referred to the extent that respondents perceived their experiences as synonymous with the history of the town (e.g., Lots of things in the town remind me of my own past). The commitment subscale referred to respondents' perceived significance of the town in their future and measured with items that reflected their commitment a future relationship with it (e.g., I would like to stay in Heidelberg indefinitely').

The five scales were strongly correlated with one another with values ranging from 0.38 (evaluation and continuity) to 0.82 (attachment and commitment), with the highest average inter-scale correlation associated with the General Attachment dimension (average  $r = 0.71$ ). "These summary statistics suggest that the five dimensions of the Urban Identity Scale are indicative of a more simple factorial structure best represented by Lalli's concept of Attachment (Jorgensen & Stedman, 2001, p. 236). Confirmatory factor analysis yielded scale loadings ranging from 0.32 ( $t = 7.69, p < 0.001$ ) for Evaluation to 0.87 ( $t = 15.40, p < 0.001$ ) for General Attachment. This result supports the suggestion that the overall scale could be represented by the Attachment construct. Internal consistency reliability, Cronbach's alpha ( $n = 198$ ) were 0.68, 0.74, 0.92, 0.72, 0.86 for Evaluation, Familiarity, Attachment, Continuity, and Commitment respectively.



In a study that employed attitude theory as the basis for characterizing sense of place (SOP) as cognitive, affective, and conative relationships with human environments, Jorgensen and Stedman (2001) proposed a multidimensional construct consisting of three factors: (1) place identity which refers to beliefs about relationship between place and self; (2) place attachment or feelings toward a place; and (3) place dependence or the behaviors that were enabled or hindered by a place as opposed to other places where such behaviors could have taken place. The researchers administered a 12-item survey to a sample of lakeshore property owners in northern Wisconsin ( $n = 282$ ). The reliability coefficients for the three subscales and the total SOP scale were 0.76, 0.84, 0.74, 0.89 for Identity, Attachment, Dependence, and SOP respectively. Based on results from the analysis of five different models (1-factor, 3-factor, higher-order, G+Group, and Correlated Uniqueness (CU) ), they found that while there was support for three univariate dimensions consistent with place attachment, place identity and place dependence, the general evaluative dimension better explained observed responses than the domain specific constructs did. Another observation was that correlations among scale items did not reveal a pattern that would suggest three attitude domains. For instance, the highest correlation among identity items was 0.53 whereas the highest correlation between identity items and dependence items was 0.51 ; so the identity items did not show significantly higher within component correlations than correlations with items from the other place domains.

This review of literature identified no sense of place studies related to students on college campus. There was lack of agreement in the literature on the dimensionality of sense of place and related concepts, as well as what the dimensions were if theorized as multidimensional. However, the significant gap in the literature that makes the study necessary was that no

empirical studies were found that related sense of place and student engagement. Furthermore, student engagement literature showed its various components that this study re-examine.

### **Chapter 3: Methodology**

This chapter presents the research design, variables in the study, target population and sample, the instrument, as well as data collection and analyses used in this study to examine the relationship between sense of place and student engagement. The measuring instrument, as well as its adaptation and development, is described. The steps for data gathering and analyses are described for this quantitative methods design. Tests for reliability and validity are also described. The last three sections of the chapter deal with the advantages and limitations of survey design method, and ethical considerations.

This is be a quantitative study employing a non-experimental cross-sectional survey method (Creswell, 2009). The primary dependent and independent variables are student engagement and sense of place respectively. The other variables in the study are the five engagement indictors (high impact practices, campus environments, experience with faculty, learning with peers, academic challenge) and the three components of sense of place (place-based affect, place identity, and place dependence). Depending on the specific research question, each one of these variables could be treated as a dependent or independent variable. But in all instances where student engagement was used in the analysis in this study, it was treated as an independent variable. Demographic data such as age, gender, classification will be treated as moderator variables. The target population was undergraduate students at Colorado State University. The instrument for this study has been developed by combining items from the NSSE grouped under the five engagement indicators (Appendix C), eleven new items to measure sense of place (Appendix D), miscellaneous campus design items and demographic information (see Appendix E). The final instrument consists of 85 items (see Appendix F), with its structure displayed in Appendix B). A stratified random sample of 6000 thousand students representing

all classifications (Freshmen, Sophomores, Juniors, and Seniors) were invited to participate in the Qualtrics web survey. They were recruited through e-mail using a list that was provided by the university's office of student affairs. Data analysis included data screening using univariate and multivariate statistics, factor analysis, various correlational analyses as well as test of reliability and validity.

### **Research Design**

This study utilized quantitative methods design (Creswell, 2009; Tashakkori & Teddlie, 2010). Quantitative research is a "means for testing objective theories by examining the relationship among variables" (Creswell, 2009, p. 4). In quantitative research, the researcher makes knowledge claims based on post-positivist worldview. He or she employs surveys and experiments as strategies for inquiry. The researcher's methods include closed-ended questions, predetermined approaches, and numeric data. A researcher identifies variables, explores the causal relationships between them, and determines the strength of such relationships. The researcher also identifies which variables to investigate further, and selects or develops instruments that will produce valid and reliable scores. In general, the researcher begins with several hypotheses, designs an experiment or survey instruments, gathers data, and analyzes the data to retain or reject the hypotheses.

This quantitative study used a non-experimental cross-sectional survey method design (Creswell, 2009). Numeric data were collected using a web-based survey and explored using exploratory factor analysis. The goal was to identify the potential predictive power of selected variables on the relationship between sense of place and student engagement among undergraduate college students. Relationship between sense of place, campus design, student engagement and student achievement (operationalized as Grade Point Average) were also

explored. The rationale for employing the quantitative approach is that the quantitative data and results paint a general picture of the research problem, by uncovering factors that contribute to or hinder student engagement.

### **Variables in the Analysis**

The primary research question in this study is: Is there a statistically significant association between sense of place and student engagement? Secondary research questions explore the relationships between sense of place, campus design, various engagement indicators, and student success and achievement. For the primary research question, *sense of place* was the independent variable; and *student engagement* was treated as the primary dependent variable, the presumed outcome or criterion (Gliner, Morgan, & Leech, 2009; Morgan et al., 2011; Thompson, 2006). Benchmarks for effective educational practices, as presented in the national survey of student engagement (Indiana University, 2009; Pascarella et al., 2010; Pike, 2006) and reframed as engagement indicators in 2013, were treated as dependent or independent variables depending on the specific research sub-question.

In addition to these five engagement indicators (*high impact practices, campus environments, experience with faculty, learning with peers, academic challenge*), the other variables in the analyses are *campus design* and the three components of sense of place (*place-based affect, place identity, and place dependence*). Depending on the specific research question, each one of these variables was treated as a dependent or an independent variable.

Demographic data such as age, gender, major, classification were treated as moderator variables to the extent that they affect "the direction and/or strength of the relation between an independent variable and a dependent or criterion variable" (Baron & Kenny, 1986, p. 1174). They may also function as mediator variables in that "they account for the relation between the

predictor and the criterion by explaining how external physical events take on internal psychological significance” (Baron & Kenny, 1986, p. 1176).

Selected factors or aspects of campus design that could contribute to or hinder student engagement were treated as independent or predictor variables because they influence, affect or cause outcomes. These factors were identified through the review of related literature, theories of student engagement, student development, campus design and campus ecology (Astin, 1984; Astin, 1993b; Kuh, 2009a; Kuh & Documenting Effective Educational Practice (Project), 2005). The sense of place (place-based affect, place identity and place dependence), and supportive campus environment (architecture, landscape, space planning) address campus design factors that were explored through specific items in the survey.

These variables were measured on a 4-point Likert-type scale in the survey instrument. For the test to have statistical power each variable was represented by at least three items on the scale in the survey instrument.

### **Target Population and Sample**

The target population in this quantitative study was a group of undergraduate students who were enrolled at Colorado State University campus in Fort Collins, Colorado during the Spring 2013 semester. A stratified random sample (Dillman et al., 2009) of 6000 students, consisting of equal numbers of freshmen, sophomores, juniors and seniors, were selected as the sampling frame and invited to participate in the Qualtrics web survey. This sampling frame was chosen based on a priori power analysis, and assumption of a typical response rate of 5% to 20% for a web survey (Dillman et al., 2009). Participants were recruited through their university e-mail addresses which the university’s Office of Student Affairs made available after the Institutional Review Board (IRB) office approved the research protocol.

## Instrumentation

### Instrument Selection

The primary outcome variable and construct of this study is student engagement. The strategy that was adopted in the study was to find an existing instrument for assessing student engagement and modify it. There are many studies that have assessed student engagement at the macro level in higher education (Handelsman, Briggs, Sullivan, & Trowler, 2005); and many instruments for measuring student engagement exist (CCI Research Inc., 2009; Trowler, 2010).

The National Survey of Student Engagement (NSSE) instrument was selected for this study because it is the most widely used student engagement survey instrument in North America (Harper & Quaye, 2009). It has also been used for more than twelve years; it has undergone improvements, and allows for modification to include additional items (Belcheir, 2003) such as built environment scales. The psychometric properties of the instrument will be discussed later in this chapter.

The National Survey of Student Engagement (NSSE, 2013) developed five engagement indicators to assess student engagement in higher education. These indicators are: (a) Academic Challenge, (b) Learning with Peers, (c) Experiences with Faculty, (d) Campus Environment, and (e) High-Impact Practices. These kinds of activities, cumulatively, describe institutional environments that foster student engagement.

*Academic challenge* assesses how hard students work to meet professors' expectations, analyze and synthesize ideas, study and prepare for academic activities, and compose papers of various lengths. This indicator includes items to measure Higher-Order Learning, Reflective and Integrative Learning, Quantitative Reasoning, and Learning Strategies.

*Learning with Peers* includes Collaborative Learning and Discussions with Diverse

Others. It assesses engagement activities such as giving help to or receiving help from other students regarding academic work, working with peers on projects during class, collaborating with classmates outside of class to prepare assignments, and interactions with those who have different demographic characteristics.

***Experiences with faculty*** assess the Quality of Student-Faculty Interactions and Good Teaching Practices by faculty members.

***Campus environment*** deals with: students' perception of the support they need to succeed academically, thrive socially, and cope with non-academic issues; it also addresses their perception of the quality of their relationship with other students, faculty, and staff at their institution.

***High impact practices*** includes: interacting across difference, taking foreign language courses, completing a culminating senior year experience (e.g., a senior thesis), and participating in a range of value-added activities, including student organizations and campus events, community service or volunteer work, study abroad programs, internships, faculty-supervised independent experiences, and learning communities. These practices are judged to have substantial positive effects on students learning and retention.

The 53 items that make up the five engagement indicators capture essential aspects of students' experience. When students engage in these activities associated with NSSE engagement indicators, considered to be academically purposeful, they achieve deep levels of learning as well as enduring and measurable gains and outcomes (Kuh et al., 2005). These indicators help to paint a broad picture based on student and institutional characteristics, but may not be adequate to make distinctions between strong and weak items. The indicators, for example, may not be the best predictors of retention, or GPA, or multi-year change. Subscales within these indicators are



smaller and more reliable (Pike, 2006).

### **Psychometric Properties of the Selected Instrument**

Over the years studies have been conducted about the quality of NSSE instrument by assessing its reliability and validity. There is a high degree of reliability for the overall Deep Learning scale and the three Deep Learning subscales ("NSSE Reliability," 2012). These Cronbach's alphas for internal consistency ranged from .699 for the first year Integrative Learning subscale to .856 for the senior overall Deep Learning scale (NSSE, 2012a). But Cronbach's alpha below .70 should be used with caution (McMillan & Schumacker, 2001). The Cronbach's alpha for the Gains scale ranged from .823 to .877. Another way to examine internal consistency is to explore the item-to-scale correlations and intercorrelations of items within a scale ( DeVellis, 2012).

A group of items that measure the same latent construct should each correlate with the overall scale, and items within the scale should correlate positively. The average inter-item correlation should lie between .15 and .50 (Clark & Watson, 1995). The average inter-item correlations for the Gains scales ranged from .482 to .565 (NSSE Psychometric Reliability Framework, 2012). Higher correlation values may indicate that respondents were more heterogeneous, so generalization of results should only apply to students with similar characteristics.

Temporal stability, which explores whether the NSSE survey produces similar results when administered to different cohorts of students at the same institutions across consecutive years, was found to be relatively high (NSSE, 2012a). The Pearson's  $r$  correlation ranged between .749 for first-year Student-Faculty Interaction to .924 for senior Enriching Educational Experience (NSSE, 2012a). Litwin (2003) suggested that Pearson's  $r$  correlations that equals .70

or higher are reasonable indicators that survey responses are consistent from one point in time to another. A high degree of equivalence reliability was also found since different versions of the same questions produced similar results. For example, when students were asked to indicate how often they asked question in class per week, it was found that they generally assigned distinct and increasing values to "never", "sometimes", "often", and "very often".

Whereas reliability deals with consistency, validity deals with accuracy in that it tests whether an instrument measures what it purports to measure (Gliner et al., 2009). Response process, content validity, construct validity, concurrent validity, predictive validity, known groups validity, and consequential validity supported the accuracy of the measurement (NSSE Psychometric Validity Framework, 2012). "The design team that developed the NSSE instrument devoted considerable time during 1998 and 1999 making certain the items were clearly worded, well-defined, and had high face and content validity" (Kuh, 2012). The relationships between the items on the survey were logical and consistent with the results of objective measures and with other research (Kuh, 2012). The responses to the survey items were approximately normally distributed and "patterns of responses to different clusters of items (College Activities, Educational and Personal Growth, Opinions About Your School) discriminate among students both within and across major fields and institutions" (Kuh, 2012). Factor analysis was also used to identify the underlying properties of student engagement items on the NSSE report. Pike(2006) also confirmed the validity of the NSSE instruments.

### **Instrument Adaptation**

The NSSE instrument consists of 107 items. Some of these items provide demographic information, and other are designed to measure specific engagement indicators. None of the items in the NSSE instrument were designed to measure the quality of, or attitude to, the physical

environment of the campus. Since the purpose of this study was to explore the relationship between *sense of place*, as an attitude to the physical campus environment, and *student engagement* the instrument was modified to reflect sense of place items.

The instrument for this study, therefore, was developed by combining items from the NSSE grouped under the five engagement indicators, eleven new items to measure sense of place, miscellaneous campus design items and demographic information (see appendices B, C,D, and E). The final instrument consists of 85 items. The items were designed according to four different formats: dichotomous answers such as "yes" and "no"; multiple-choice; 4-point Likert-type; and open-ended questions (see Appendix F). A panel of experts evaluated the instrument for content validity. The final instrument structure is displayed in Appendix B.

### **Data Collection**

This quantitative study focused on how sense of place and its components contribute to or hinder student engagement among undergraduate students at CSU. The study employed cross-sectional survey design where data are collected at one point in time (Gall, Gall, & Borg, 2007; McMillan, 2012). The survey instrument was adapted from the National Survey of Student Engagement survey instrument (NSSE, 2012b).

The survey instrument was web-based using Qualtrics web survey and accessed through the URL, which was sent to a stratified random sample of 6000 current undergraduate students at CSU consisting of four groups of 1500 students each of freshmen, sophomores, juniors and seniors. One advantage of using web-based survey was that participants' responses were automatically stored in a database that was easily transformed into numeric data in Statistical Package for Social Sciences (SPSS). All students have university issued e-mail addresses which were used to send out the surveys. Informed consent was sought through the recruitment cover e-

mail (see Appendix M). Participants who agreed to take the survey clicked on the link to the web survey, as an indication of their consent to participate in the study.

A two-phase follow-up sequence was employed to decrease the response rate error and solicit a high response rate (Dillman et al., 2009). Two e-mail reminders were sent out 7 days, and twenty days respectively after the initial distribution of the survey URL. Each e-mail stressed the importance of participants' input in the study. The web survey software, Qualtrics, was programmed to send reminders to non-respondents only.

### **Data Analysis**

The data were screened using univariate and multivariate statistics (Field & Miles, 2010). This process helps to identify potential multicollinearity in the data because multivariate analyses are sensitive to very high correlations among independent variables. Outliers in the data must be excluded from analysis because a case in one category of outcomes may appear probabilistically to be in another category. A situation like this could result in misleading conclusions (Field & Miles, 2010; Gliner et al., 2009; Morgan et al., 2011).

Descriptive statistics involving all variables were done to check for missing data, normality, linearity, multivariate outliers, multi-collinearity and singularity. Descriptive statistics of survey items was described and reported in chapter 4. Frequencies showed valid percentages for responses to all the survey questions.

The primary research question, "Is there a statistically significant association between sense of place and student engagement among undergraduate college students?" determined the statistical tests and analyses that were employed in the study. Factor analysis was employed to identify the key factors that load more highly on the various scale items of the survey instrument

so as to isolate the most important predictors of student engagement or its subsets (DeVellis, 2012; Field & Miles, 2010; Leech, Barrett, & Morgan, 2011).

The method for extracting factors or components that was used in this study, factor analysis, does not make "strong distributional assumptions; normality is important only to the extent that skewness or outliers affect the observed correlations" (Leech et al., 2011, p. 65). In instances where multivariate normality, homogeneity, and linearity may be required, screening at a very early stage becomes crucial before conducting further analysis. Should data not satisfy any underlying assumptions, the statistical result would not accurately paint a picture of reality. In case basic assumptions were not met, data would be transformed (Field & Miles, 2010; Leech et al., 2011).

The results of the analyses were reported in the form of the discussion. The eigenvalues showed information regarding the percentage of the variance predicted by each factor or component in the factor analysis. The Bartlett's test yielded the Chi-Square value to show the statistical significance for the factor analysis. The factor loadings indicate the relative importance of the variables in predicting the outcomes.

All statistical analyses of the quantitative results were done using IBM Statistical Package for Social Sciences software (IBM SPSS), version 21.0 and G\*Power version 3 for statistical power.

### **Data Limitation**

The sampling frame was 6000 but only 524 total responses were recorded including partial completions. This represented less than 10% response rate. There were 358 completed surveys. Question by question analysis showed that each of the Likert-type questions were completed by 381 respondents at the low end and 417 respondents at the high end. Whereas the

response rate was low, the sample size was adequate for the analyses based on a priori power analyses conducted prior to launching the survey. With assumption of moderate effect size, alpha error = 0.05, power = 0.8, and two tails tests, various F-tests, t-tests, and chi-square were done a priori for required sample sizes. The largest required sample size found was 343 for t-test - linear bivariate regression: one group, size of slope. These analyses were done using G\*Power software.

### **Reliability and Validity**

Reliability and validity of the instrument are very important in reducing measurement errors in quantitative research. Reliability refers to the consistency of an instrument in measuring the data it is designed to measure. Test-retest reliability of the survey instrument was conducted to demonstrate stability over time. Repeated administration of the survey instrument to similar samples of study participants would yield different sets of scores that the researcher would correlate to find out how much consistency is in the data (Huck, 2012). In this study, results of the survey would be compared and correlated with the results of past NSSE test for certain scales. The test-retest reliability coefficient, also known as stability coefficient, will be reported as Pearson  $r$  coefficient (Field & Miles, 2010) only after the test is re-administered in a future study.

Internal consistency reliability analysis of the items measured on the Likert-type scale were conducted to determine whether the various parts of the instruments (i.e., questions or subsets of questions) hang together and measure the same thing (Huck, 2012); in this study, they should all be measuring student engagement or any of its indicators, as well as sense of place and campus design. This was done by computing Cronbach's Alpha for this study and presented in chapter four.

Validity refers to the degree to which a measuring instrument measures what it purports to measure (Huck, 2012). Content, criterion-related, and construct validity of the survey instrument were established. Content validity refers to the extent "to which the various items collectively cover the material that the instrument is supposed to cover"(Huck, 2004, p. 89). In order to show that the items cover the content they should, the survey instrument was examined by a group of university professors who served as experts.

Content validity is established by experts' subjective opinion after carefully comparing the content of the test against an outline that specifies the instrument's claimed domain (Huck, 2012). The review by experts determines whether the survey items or questions seem: (1) relevant to the content they are designed to measure; (2) to be a reasonable way to gather the information needed; and (3) well-designed.

Criterion-related validity refers to the "degree to which new instruments provide accurate measurements by comparing scores from the new instrument with scores on a relevant criterion variable" (Huck, 2004, p. 90). The results of this study were compared with results from existing instruments measuring the same construct: undergraduate students' engagement at CSU. In other words, validity of the new instrument was determined by finding out how participants scored on the new instruments and the criterion variable, and then correlating these two sets of scores (Gliner et al., 2009; Huck, 2012). Items measuring sense of place were compared to similar instruments for sense of place assessment in other settings. At this time, no instrument has been found that measures exactly what this study is intended to address. The correlation value  $r$  is reported as the validity coefficient.

Construct validity is "directly concerned with the theoretical relationship of a variable (e.g., a score on some scale) to other variables" (DeVellis, 2012, p. 64). It concerns the degree to

which a measure behaves the way the construct it is supposed to measure should behave with respect to "established measures of other constructs" (DeVellis, 2012, p. 64). To establish construct validity, one or more of these three things need to happen: (1) show that the construct has a strong relationship with certain measured variables and a weak relationship with others, with these relationships linked conceptually to the new instrument's construct in a logical manner; (2) show that certain groups obtain higher means scores than others, with these groups being determined prior to the administration of the new instrument; or (3) perform a factor analysis on the scores from the new instrument (Huck, 2012).

In this study, factor analysis of the Likert-type survey items was done. Factor loading for survey items were examined for correlation between the items and the overall factor. In an ideal situation, the result of the factor analysis would display the following characteristics: (1) each factor should show strong loading on several items or variables (2) each item or variable should have a strong loading for only one factor, and (3) each item or variable should have a large communality (or degree of shared variance).

Construct validity is also concerned with idea that the results generated from a researcher's instrument should correlate with other related constructs in the expected manner. Results from this study were also compared with results from other studies measuring related constructs such as factors that predict student engagement and student outcomes.

### **Advantages and Limitations of the Survey Design Method**

The strengths and weaknesses of survey methods designs have been widely discussed in literature (Creswell, 2009; Dillman et al., 2009). Advantages of this design include: relative low cost especially for self-administered surveys, quick turnaround in data collections, flexibility during survey development on how questions will be administered, ease of gathering data from



large samples and asking many questions about a given topic, ease of remote administration, and standardization of questions to ensure that participants' use common definitions and interpretations of data are consistent. The limitations of this design include: inflexibility of the design since it requires the instrument to remain unchanged throughout the data gathering phase, the difficulty of creating questions and response options that would be minimally appropriate for all participants, and the need for a certain minimum sample size in order to conduct meaningful analysis. Another limitation is that survey participants may not always remember information being asked or may choose to misrepresent information. Low response is also a limitation.

### **Research Permission and Ethical Considerations**

Ethical issues were addressed in the study. In compliance with regulations of the Institutional Review Board (IRB), the permission for conducting the research was obtained. The Request for Review Form was filed, providing information about the principal investigator, co-principal investigator, the project title and type, source of funding, type of review requested, number and type of subjects. Application for research permission contained the description of the project and its significance, methods and procedures, participants, and research status. This project was accorded an exempt status, since the survey did not collect identifying information and all participants were over 18 years old.

An informed consent statement was developed and was included in the recruitment e-mail. The recruitment e-mail stated that participants were guaranteed certain rights and acknowledged that their rights would be protected. A statement relating to informed consent was included in the web survey. The anonymity of participants was protected by numerically coding each returned questionnaire and keeping the responses confidential. The coding was done automatically by the Qualtrics web survey software. All study data, including the survey

electronic files, will be kept in the locked metal file cabinets in the researcher's home office and destroyed after a reasonable period of time. Participants were informed that summary data will be disseminated to the professional community, but in no way it will be possible to trace responses to individuals.

## **Chapter 4: Results**

The results of the data analysis described in chapter three are reported in this chapter. The first section presents the survey response rate and descriptive statistics. Results of the factor analysis, as well as tests of reliability of the instrument, are presented in the second section. The third section presents the results of the hypotheses testing and the relationships among variables.

### **Descriptive Statistics**

#### **Survey Response Rates**

The web survey was sent to 6,000 undergraduate students at CSU and 524 students responded, representing an 8.73 percent response rate. The number of respondents for each of the Likert-type questions ranged from 381 to 417, representing 6.35 percent to 6.95 percent response rate.

#### **Data Screening**

The data were checked and screened visually and by conducting exploratory data analysis. Missing values for each of the seventy Likert-type items ranged from 109 to 188 for the 524 respondents. No question was answered by 100 percent of the respondents. Missing values were excluded list-wise in the analysis (valid N = 336 to 417; missing = 109 to 188). No errors were found in the data.

An analysis of the item distributions revealed that of the seventy Likert-type items, 42 were negatively skewed (skewness statistic ranged from -1.025 to -.003), and 28 were positively skewed (skewness statistic ranged from .01 to .776). Skewness statistics for all items fell between -1 to 1, except “quality of interactions with students,” for which, the skewness statistic was -1.025. Skewness statistics for 25 of the seventy items were approximately twice the standard error of skewness, making them approximately normally distributed. The remaining

individual items that were more skewed were not transformed individually. Minimum and maximum scores were 1 and 4, respectively. The mean scores of the seventy items ranged from 1.89 for “Worked with a faculty member on activities other than coursework,” to 3.37 for “Quality of interactions with students.” Descriptive statistics of the seventy Likert-type items are presented in Appendix G.

### **Demographic Statistics**

The respondents were 31 percent (N = 115) males and 69 percent (N = 257) females. There were 97.6 percent U.S. students and 2.4 percent were international students. Age demographics showed that 28.2 percent (N = 105) were 18 or 19 years old, 36.3 percent (N = 135) were 20 or 21 years old, 21.5 percent (N = 80) were 22 or 23 years old, and 14 percent (N = 52) were 24 years or older.

Ethnically, 82.7 percent of respondents (N = 307) were white (non-hispanic), 1.3 percent (N = 5) were black or African-American, 0.8 percent (N = 3) were Asian or Asian American, 0.8 percent (N = 3) were Native American, 3 percent (N = 11) were Mexican or Mexican American, 0.5 percent (N = 2) were Puerto Rican, other Hispanic groups were 2.7 percent (N = 10), multi-racial were 1.1 percent (N = 4), the category “Other” were 2.4 percent (N = 9), and “Prefer not to respond” were 4.6 percent (N = 17).

With respect to the classifications of respondents, 22.6 percent (N = 84) were freshmen, 20.2 percent (N = 75) were sophomores, 25.3 percent (N = 94) were juniors, 30.7 percent (N = 114) were seniors, and 1.1 percent (N = 4) were unclassified. In terms of their registration status, 94.3 percent (N = 349) were full-time students and 5.7 percent (N = 21) attended school part-time. Regarding where the respondents lived while attending CSU, 24.6 percent (N = 91) lived in campus housing or dormitory, 3 percent (N = 11) lived in fraternity houses, 30.8 percent (N =

114) lived in apartments within walking distance to the campus, 40 percent (N = 148) lived in apartments farther away from campus, and 1.6 percent (N = 6) indicated that none of these categories applied to them. Frequencies of demographic variables for study respondents are presented in Appendix H.

### **Descriptive Statistics of Derived Variables**

The key variables in this study were derived by computing the mean scores of the items that make up the scales for the constructs they measure. These variables, derived from the seventy Likert-type items in the Student Engagement and Sense of Place Survey (SESOPS) instrument, are Sense of Place and its components (Place Attachment or Place-based Affect, Place Identity, and Place Dependence), Campus Design, Student Engagement, Student Engagement Indicators (Academic Challenge, Learning with Peers, Experience with Faculty, Campus Environment, and High Impact Practices) and ten engagement scales (Higher Order Learning, Reflective and Integrative Learning, Learning Strategies, Quantitative Reasoning, Diverse Interactions, Collaborative Learning, Student Faculty Interaction, Good Teaching Practice, Quality of Interactions, and Supportive Environment). These engagement scales are components of four of the engagement indicators as shown in Appendix C. All the scales and subscales for Sense of Place, Campus Design and Student Engagement are displayed in Appendixes B, C, D and E.

The descriptive statistics of the derived variables are displayed in Appendix G. Of these 21 derived variables, ten were negatively skewed (skewness statistic ranged from -.447 for “campus design” to -.032 for “high impact practices”), and eleven were positively skewed (skewness statistic ranged from .028 for “good teaching practice” to .772 for “student faculty interactions”). Skewness statistics for all items fell between -1 and 1. Skewness statistics for

fourteen of these items were less than twice the standard error of skewness, and so, were considered normally distributed. The remaining items were not transformed to reduce skewness because assumptions of normality were not markedly violated. These variables were considered approximate normal distributions.

## **Scale Development and Reliability**

### **Exploratory Factor Analysis**

This section presents the results of the exploratory factor analysis, which was used to check the alignment of the factors of “sense of place” and “student engagement,” that were identified in the previous three chapters. Two different factor analyses were conducted: (1) sense of place items, and (2) the combination of sense of place, campus design, and student engagement items.

A principal axis factor analysis with oblique rotation (promax) was conducted to assess the underlying structure for the eleven items in the Sense of Place scale. The Kaiser-Meyer-Olkin measure verified the sampling adequacy for the analysis, which was .94. This score is considered “superb”, according to Field (2009); and all KMO values for individual items were greater than .92, which is well above the acceptable limit of .5 (Field, 2009). Bartlett’s test of sphericity ( $\chi^2 = 2421.52$ ,  $df = 55$ ,  $N = 397$ ,  $p < .001$ ) indicated that correlations between items were sufficiently large for principal axis factor analysis. Three factors were requested, based on the fact that items were designed to index three constructs: place attachment or place-based affect, place identity and place dependence. After rotation, the first factor accounted for 56.1 percent of the variance, the second factor accounted for 7.3 percent, and the third factor accounted for 7.1 percent. Table 4.1 displays the items and factor loadings for the rotated factors, with loadings less than .40 suppressed to improve clarity.

Table 4.1

*Pattern Matrix for Sense of Place Scale*

<b>Pattern Matrix<sup>a</sup></b>				
	Factor			Communality
	1	2	3	
The CSU campus is a reflection of me	.816			.682
This campus says very little about who I am	-.760			.519
This campus reflects the type of person I am	.727			.647
This campus provides many of the opportunities to engage in my favorite activities	.461			.469
I can really be myself on the CSU campus		.753		.378
I am happy when I am on the CSU campus		.670		.570
I feel relaxed when I'm on the CSU campus		.575		.463
This campus is not a good place to do the things I most like to do				
As far as I am concerned, there is no better place to be than on the CSU campus			.774	.521
I really miss the CSU campus when I'm away from it for a long time			.772	.472
The CSU campus is one my favorite places to be			.541	.614

Extraction Method: Principal Axis Factoring.

Rotation Method: Promax with Kaiser Normalization.

a. Rotation converged in 7 iterations.

A principal axis factor analysis was conducted on the seventy items that measured various constructs with oblique rotation (promax). The Kaiser-Meyer-Olkin measure verified the

sampling adequacy for the analysis with a score of .86, which is very good according to Field (2009), and all KMO values for individual items were greater than .78, which is well above the acceptable limit of .5 (Field, 2009).

Bartlett's test of sphericity ( $\chi^2 (2415) = 9254.97, p < .001$ ) indicated that correlations between items were sufficiently large for factor analysis. Thirteen factors were requested, based on preliminary analysis and the number of constructs that were identified in the literature. After rotation, the first factor accounted for fourteen percent of the variance, the second factor accounted for 5.7 percent, the third factor accounted for 3.4 percent, and the fourth factor accounted for 2.9 percent. Taken together, the thirteen factors accounted for 61.9 percent of the variance. Appendix H displays the items and factor loadings for the rotated factors with loadings less than .30 suppressed to improve clarity.

## **Scales**

*Original Scales (Pre-EFA)* were developed based on the literature review and adaptation of existing instruments. These scales assess sense of place, campus design, and student engagement. Scale items are organized under subscales and scales presented in Appendixes B, C and D.

*Final Scales (Post-EFA)* were found to vary from the original scales in terms of the grouping of items following the exploratory factor analysis. The sense of place scale changed most significantly. The original sense of place scale consisted of eleven items that were grouped into the following three subscales: place attachment (PA), place identity (PI), and place dependence (PD). After Exploratory Factor Analysis, with factor loadings of less than .3 suppressed, ten items were loaded into three factors, where each factor combined items from two or more of the original subscales (place attachment, place identity and place dependence). For



instance, factor 1 consists of three *place identity* items and one *place dependence* item as shown in Table 4.2. Factor 2 combines one items listed under *place identity* in the original scale (“I can be myself on the CSU campus”), with two other items identified as measures of *place attachment*. Factor 3 combines one *place dependence* item with two *place attachment* items.

Table 4.2

*Sense of Place Factors from Exploratory Factor Analysis*

Sense of Place Items (Post EFA)	Original Subscale of items (Pre-EFA)
<i>Factor 1</i>	
The CSU campus is a reflection of me.	Place Identity
This campus says very little about who I am.	Place Identity
This campus reflects the type of person I am.	Place Identity
This campus provides many of the opportunities to engage in my favorite activities.	Place Dependence
<i>Factor 2</i>	
I can really be myself on the CSU campus.	Place Identity
I am happy when I am on the CSU campus.	Place Attachment
I feel relaxed when I’m on the CSU campus.	Place Attachment
<i>Factor 3</i>	
As far as I am concerned, there is no better place to be than on the CSU campus.	Place Dependence
I really miss the CSU campus when I am away from it for a long time.	Place Attachment
The CSU campus is one of my favorite places to be.	Place Attachment

The student engagement scales remained the same, except for one change. The item labeled as ‘Quality of Interaction with Students’ under the subscale ‘Quality of Interactions’

(which is part of the ‘Campus Environment’ indicator) loaded under ‘Collaborative Learning’, which is a component of the ‘Learning with Peers’ indicator (see Appendix B). The items listed in the campus design scale remained unchanged after the Exploratory Factor Analysis (see Appendix D).

### **Reliability Analysis**

***Original sense of place scale.*** Cronbach’s alpha was computed to assess whether the data from the four variables that were summed to create the place attachment score formed a reliable scale. The alpha for the four items combined was .82, which indicates high internal consistency reliability. Similarly, the alpha for the place identity scale, consisting of three items, was .83, which also indicated good internal consistency. The three items that were summed to create the place dependence scale yielded an alpha value of .74, which indicated acceptable internal consistency reliability. The overall sense of place scale, consisting of eleven items that were grouped under three subscales (place attachment, place identity and place dependence), had a Cronbach’s alpha of .92, which indicated high internal consistency reliability.

***Final sense of place scale.*** Based on the exploratory factor analysis of the eleven *sense of place* (SoP) items, three factors were extracted (see Table 4.3). The items grouped under these three factors only partially aligned with the items grouped under the subscales: *place attachment*, *place identity*, and *place dependence*. These factors are labeled as SoP\_factor1, SoP\_factor2, and SoP\_factor3, with Cronbach’s alpha values of .86, .77, and .82, respectively. These values represent reasonable to very good internal consistency reliability.

Table 4.3

*Sense of Place Factors Post-EFA for Reliability Check*

<b>Pattern Matrix<sup>a</sup></b>			
	Factor		
	1	2	3
The CSU campus is a reflection of me	.816		
Reversed-This campus says very little about who I am	.760		
This campus reflects the type of person I am	.727		
This campus provides many of the opportunities to engage in my favorite activities	.461		
I can really be myself on the CSU campus		.753	
I am happy when I am on the CSU campus		.670	
I feel relaxed when I'm on the CSU campus		.575	
Reversed-This campus not a good place to do the things I most like to do			
As far as I am concerned, there is no better place to be than on the CSU campus			.774
I really miss the CSU campus when I'm away from it for a long time			.772
The CSU campus is one my favorite places to be			.541

Extraction Method: Principal Axis Factoring.

Rotation Method: Promax with Kaiser Normalization.

a. Rotation converged in 7 iterations

Cronbach's alpha was also computed to assess the internal consistency reliability of the entire instrument consisting of all seventy items; this yielded an alpha value of .93. This represents high internal consistency reliability.

Exploratory factor analysis of the seventy items on the entire instrument yielded thirteen factors (see Appendix H). Cronbach's alpha was computed to assess whether the data from the

variables that were summed to create the scores for each of the factors formed a reliable scale.

Table 4.4 shows the alpha values for each of the factors.

Table 4.4

*Cronbach's Alpha for Instrument's Scales and Subscales*

Factor	Label	No. of Items	Alpha	Comments
1	Sense of Place	11	.92	Alpha unchanged and high
2	Supportive Environment	8	.872	Same alpha and very good
3	Diverse Interactions	5	.820	Same alpha and very good
4	Campus Design	4	.849	Same alpha and very good
5	Good Teaching Practice	4	.845	Same alpha and very good
6	Reflective & Integrative Learning	6	.849	Alpha=.851(7 items) and very good
7	Student Faculty Interaction	4	.833	Same alpha and very good
8	Higher Order Learning	4	.773	Same alpha and reasonable
9	Collaborative Learning	5	.781	Alpha=.802 ( 4 items) and good. Higher reliability than scale derived from EFA
10	Quality of Interactions	4	.766	Alpha=.74 in the original with 5 items and reasonable
11	Quantitative Reasoning	3	.827	Same alpha and very good
12	Learning Strategies	3	.588	Same alpha and low
13	High Impact Practices	4	.570	Alpha = .598 with 6 items in the original scale, and low

‘Quality of Interactions with Students’ was dropped from the ‘Quality of Interactions’ subscale in the original scale and loaded onto Collaborative Learning. After EFA, only four out of the original six ‘High Impact Practices’ items were retained.

## Relationships among Variables and Tests of Hypotheses

The primary purpose of this study was to examine the relationship between ‘Sense of Place’ and ‘Student Engagement’, as well as the relationships between the three components of sense of place and eleven NSSE engagement indicators among undergraduate students at CSU. In order to explore these relationships, seven research questions and corresponding null hypotheses were proposed. The remainder of this chapter explores each question in depth.

### Research Question One

Is there a statistically significant association between sense of place and student engagement among undergraduate students at CSU?

**H<sub>0</sub>1:** There is no statistically significant association between sense of place and student engagement among undergraduate students at CSU.

To investigate if there was a statistically significant association between sense of place and student engagement, a correlation was computed. Descriptive statistics of the two variables (sense of place and student engagement) in Table 4.5 show the skewness values of the two variables under consideration to be less than twice the standard error of skewness.

Table 4.5.

#### *Descriptive Statistics for Sense of Place and Student Engagement*

Variable	1	2	N	M	SD	Skewness	S.E. of Skewness
Sense of place	1	.43**	417	2.625	.371	-.208	.120
Student engagement	-	1	415	2.662	.375	.181	.120

\*\* . Correlation is significant at the 0.01 level (2-tailed).

b. Listwise N=415

Figure 4.1 and Figure 4.2 show the histograms with superimposed normal curves. These indicate that the assumption of normality was not violated. Thus, the Pearson’s correlation

statistic was calculated ( $r(413) = .43, p < .001$ ) (see Table 4.5). The direction of the correlation was positive, which means that students who had high sense of place scores also had high student engagement scores and vice versa. Hence, null hypothesis one was rejected. Using Cohen's (1988) guidelines, the effect size is somewhat larger than typical (with  $r = .3$  and  $r = .5$  considered to be typical, and larger than typical, respectively) in this area of study.  $R^2$  was .1849, indicating that approximately 18.5 percent of variance in student engagement can be predicted from the sense of place scale.



Figure 4.1. Sense of Place Histogram with Superimposed Normal Curve

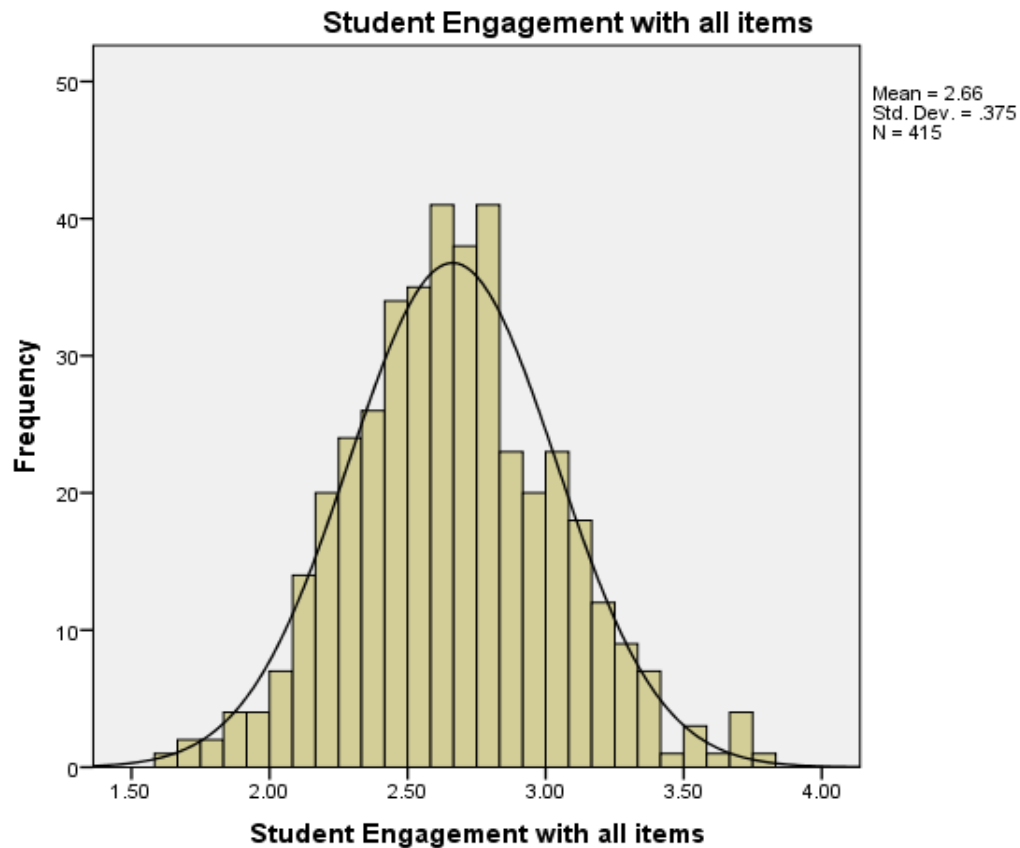


Figure 4.2. Student Engagement Histogram with Superimposed Normal Curve

## Research Question Two

Is there a statistically significant association between campus design and student engagement among undergraduate students at CSU?

**H<sub>02</sub>:** There is no statistically significant association between campus design, and Student Engagement among undergraduate students at CSU.

To investigate if there was a statistically significant association between campus design and student engagement, a correlation was computed. Assumptions of normality were not markedly violated. Thus, Pearson's correlations were computed between campus design and Student Engagement ( $r = .36, p < .001$ ) (see Table 4.6). This result represents a medium effect size. From this result, null hypothesis two was also rejected.

Table 4.6

*Intercorrelations, Means, and SDs for Key Variables*

(N = 367)		Correlations <sup>b</sup>				
		1	2	3	M	SD
1. Sense of Place	Pearson Correlation	--	.459**	.508**	2.625	.375
	Sig. (2-tailed)		.000	.000		.
2. Student Engagement	Pearson Correlation	--	--	.360**	2.669	.368
	Sig. (2-tailed)			.000		
3. Campus design	Pearson Correlation	--	--	--	3.058	.531
	Sig. (2-tailed)					

\*\* . Correlation is significant at the 0.01 level (2-tailed).

b. Listwise N=367

### Research Question Three

Is there a statistically significant association between campus design and sense of place among undergraduate students at CSU?

**H<sub>03</sub>:** There is no statistically significant association between campus design and sense of place among undergraduate students at CSU.

To investigate if there was a statistically significant association between campus design, and sense of place, a correlation was computed. Assumptions of normality were not markedly violated. Therefore, Pearson's correlations were computed between campus design and sense of place ( $r = .508$ ,  $p < .001$ ) (see Table 4.7). This result represents a large effect size, and so null hypothesis three was rejected.



#### Research Question Four

Are there statistically significant associations between components of sense of place (place attachment or place-based affect, place dependence, and place identity), campus design, and the following engagement indicators from the NSSE: academic challenge, learning with peers, experiences with faculty, campus environment, and high impact practices?

**H<sub>04</sub>:** There are no statistically significant associations between components of sense of place (place attachment or place-based affect, place dependence, and place identity), campus design, and the following engagement indicators from the NSSE: academic challenge, learning with peers, experience with faculty, campus environment, and high impact practices.

This null hypothesis has 36 parts based on unique pairings of these variables.

The variables in this research question did not markedly violate assumptions of normality (see Table 4.7), so Pearson's correlations were computed to determine the associations between the variables.

Table 4.7

#### *Descriptive Statistics of Sense of Place and Campus Design Variables*

		Statistics				
		Sense of place	Place attachment	Place identity	Place dependence	Campus design
N	Valid	397	410	407	410	383
	Missing	131	118	121	118	145
Mean		2.6233	2.8232	2.6167	2.3740	3.0611
Std. Deviation		.37440	.60318	.35165	.33451	.52864
Skewness		-.193	-.102	-.361	-.042	-.447
Std. Error of Skewness		.122	.121	.121	.121	.125
Minimum		1.55	1.00	1.25	1.33	1.00
Maximum		3.45	4.00	4.00	3.67	4.00

The Pearson's correlations shown in Appendix K indicate that Place Attachment (place-based affect) is significantly associated with Academic Challenge ( $r = .276, p < .001$ ), Learning with Peers ( $r = .234, p < .001$ ), Experience with Faculty ( $r = .310, p < .001$ ), Campus Environment ( $r = .467, p < .001$ ), and High Impact Practices ( $r = .262, p < .001$ ).

Place Identity is also significantly associated with all of the same factors: Academic Challenge ( $r = .241, p < .001$ ), Learning with Peers ( $r = .193, p < .001$ ), Experience with Faculty ( $r = .285, p < .001$ ), Campus Environment ( $r = .433, p < .001$ ), and High Impact Practices ( $r = .235, p < .001$ ).

Place Dependence did not show significant association with Learning with Peers, but was significantly associated with Academic Challenge ( $r = .122, p = .024$ ), Experience with Faculty ( $r = .167, p = .002$ ), Campus Environment ( $r = .315, p < .001$ ), and High Impact Practices ( $r = .158, p = .003$ ).

Campus Design is significantly associated with Academic Challenge ( $r = .237, p < .001$ ), Learning with Peers ( $r = .166, p = .002$ ), Experience with Faculty ( $r = .222, p < .001$ ), and Campus Environment ( $r = .472, p < .001$ ).

Sense of place was found to be significantly associated with Academic Challenge ( $r = .251, p < .001$ ); Learning with Peers ( $r = .195, p < .001$ ); Experience with Faculty ( $r = .291, p < .001$ ); High Impact Practices ( $r = .259, p < .001$ ).

The effect sizes for all these associations ranged from small ( $r = .122$ , between Place Dependence and Academic Challenge) to large ( $r = .472$ , between Campus Design and Campus Environment), according to Cohen's (1988) guidelines. The largest effect sizes were recorded between Campus Environment and Campus Design ( $r = .472$ ), Place Attachment ( $r = .467$ ), Place Identity ( $r = .433$ ) and Place Dependence ( $r = .315$ ). Hence, Campus Design, Place

Attachment, Place Identity and Place Dependence predicted 22 percent, 21.8 percent, 18.7 percent and ten percent, respectively, of the variation in Campus Environment scores.

Two relationships were found to be not significant: Learning with Peers and Place Dependence ( $r = .095, p = .077$ ) as well as Campus Design and High Impact Practices ( $r = .049, p = .364$ ). The sub-null hypotheses of ‘campus design is not related to High Impact Practices’, and ‘Learning with Peers is not significantly related to Place Dependence cannot be rejected. All other parts of null hypothesis four were rejected. Correlations tables are presented in Appendix I.

### **Research Question Five**

Are there statistically significant associations between sense of place campus design, the engagement indicators from the NSSE (academic challenge, learning with peers, experiences with faculty, campus environment, and high-impact practices), and Grade Point Average?

**H<sub>05</sub>:** There are no statistically significant associations between sense of place, campus design, and the following engagement indicators from the NSSE: academic challenge, learning with peers, experience with faculty, campus environment, and high impact practices), and Grade Point Average.

Pearson correlations were used because the variables did not markedly violate assumptions of normality, and computed to determine the association between the variables. As shown in the correlations table in Appendix J, Grade Point Average is significantly associated with Academic Challenge ( $r = .145, p = .006$ ); Learning with Peers ( $r = .11, p = .037$ ); Experience with Faculty ( $r = .139, p = .008$ ); Campus Environment ( $r = .145, p = .005$ ); and with High Impact Practices ( $r = .13, p = .013$ ). These are all small effect sizes according to Cohen’s (1988) guidelines. No statistically significant association was found between sense of place and

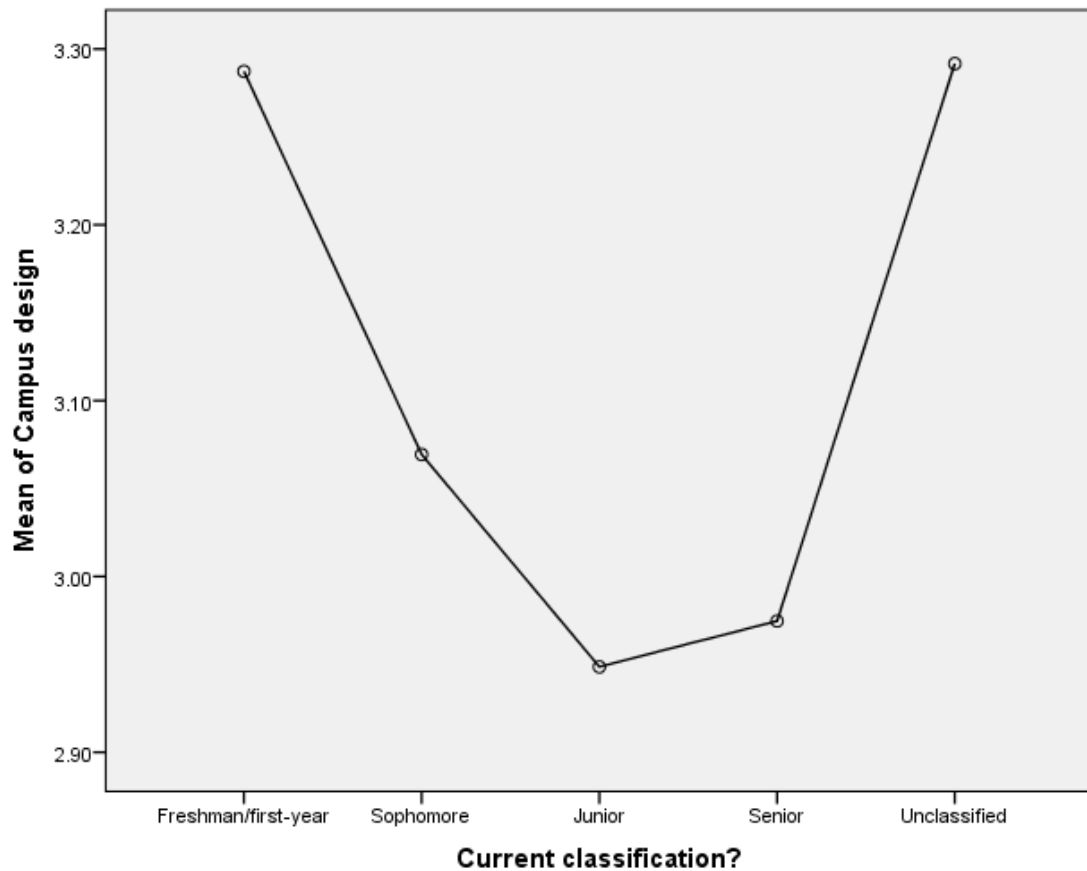
grade point average ( $r = .023, p < .672$ ). Also, no significant association was found between campus design and Grade Point Average ( $r = .012, p < .812$ ).

### **Research Question Six**

Are there statistically significant differences among the four classifications of undergraduate students on their campus design, sense of place and student engagement scores?

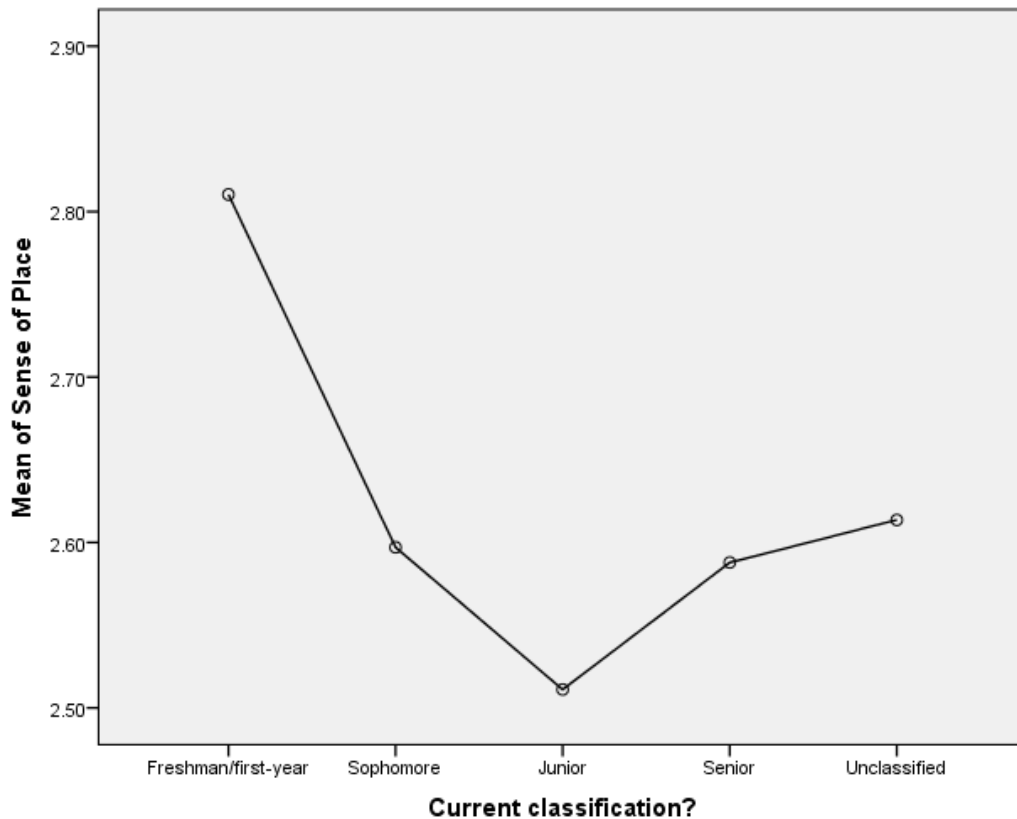
**H<sub>06</sub>:** There are no statistically significant differences among the four classifications of undergraduate students on their campus design, sense of place, and student engagement scores.

To determine the effect of the four levels of undergraduate students' classification on campus design, sense of place and student engagement, a one-way ANOVA was done. Assumptions of independent observations, equality of variance, and normality of the dependent variables were met. Figure 4.3 shows that the mean campus design score was highest among freshmen and steadily declines through the sophomore year until it reaches a low point in the junior year before making a slight recovery in the senior year. The unclassified group represents the 4 out of 354 respondents who did not indicate classification in college. This group has no significant effect on the overall pattern because of its relatively small size.



*Figure 4.3.* Mean Campus Design Scores against Classification

Figure 4.4 also shows a steady decline in sense of place score from 2.81 in the freshman year to a minimum of 2.51 in the junior year before rising slightly to 2.58 in the senior year. The unclassified group is excluded in describing the overall pattern because of the very small number of respondents in the group.



*Figure 4.4.* Mean Sense of Place Scores against Classification

Figure 4.5 shows similar engagement levels among freshmen and sophomores, and a decrease in the junior year before attaining the highest level in the senior years. The value of these graphs is to show the trend visually not for precise assessment. The unclassified group consists of only four individuals who responded to the questions but did not indicate their classification. Since the plots merely represent the mean scores without weighting the sample size, the unclassified group appears graphically more significant than it is.

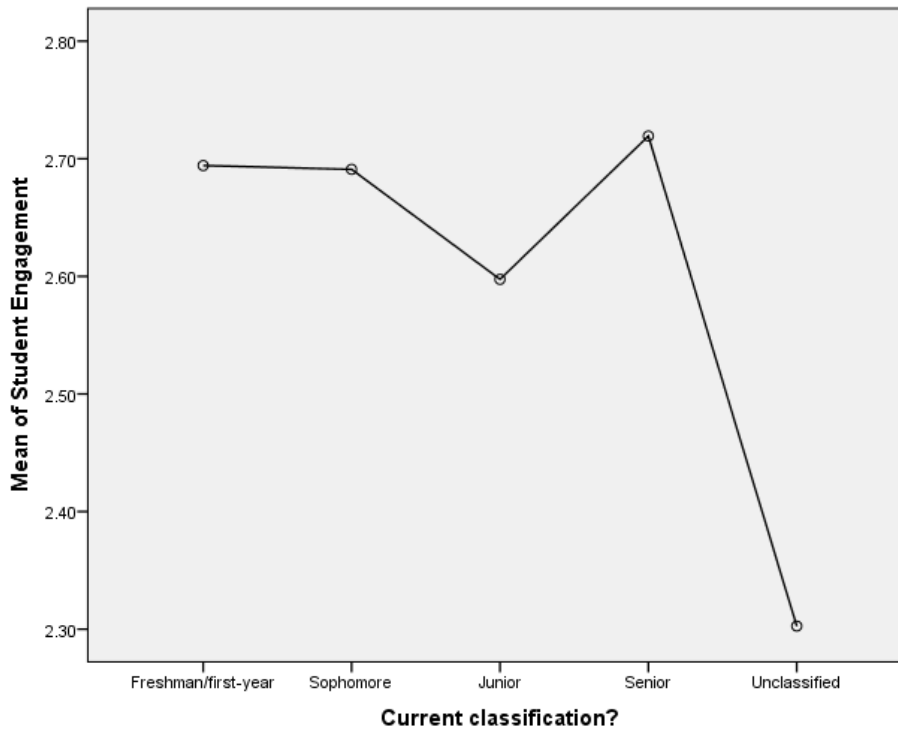


Figure 4.5. Mean Student Engagement Scores against Classification

A statistically significant difference was found among the four levels of classification of undergraduate students on campus design,  $F(4, 364) = 6.14, p < .001$ ; on sense of place,  $F(4, 349) = 7.98, p < .001$ ; and on student engagement,  $F(4, 366) = 2.57, p < .038$  as shown on Table 4.9. Table 4.8 shows that the mean campus design scores are 3.29, 3.07, 2.95 and 2.97 for freshmen (first-year students), sophomores, juniors and seniors respectively. Post hoc Tuckey HSD tests indicate that first year students and juniors differed significantly in their assessment of campus design with somewhat large effect size ( $p < .05, d = .72$ ); also freshmen and seniors differed significantly in their assessment of campus design with typical effect size ( $p < .05, d = .65$ ). Similarly on sense of place scores, freshmen differed significantly from sophomores ( $p < .05, d = .6$ ), from juniors ( $p < .05, d = .81$ ) and from seniors ( $p < .05, d = .61$ ). No significant differences were found on the mean engagement scores among the four classification levels of students.

Table 4.8

*Means and Standard Deviations Comparing Students' Classifications*

Classification	Campus Design			Sense of Place			Student Engagement		
	n	M	SD	n	M	SD	n	M	SD
Freshman (First year)	84	3.29	0.397	81	2.81	0.365	84	2.69	0.385
Sophomore	74	3.07	0.519	74	2.60	0.348	75	2.69	0.369
Junior	94	2.95	0.541	90	2.51	0.372	94	2.60	0.371
Senior	113	2.97	0.572	105	2.59	0.359	114	2.72	0.354
Unclassified	4	3.29	0.370	4	2.61	0.261	4	2.30	0.277
Total	369	3.06	0.531	354	2.62	0.374	371	2.67	0.371

Note: This table presents means, and standard deviations comparing classifications of undergraduate students.

Table 4.9

*One-Way ANOVA Summary: Students' Classifications on Key Variables*

		Sum of Squares	df	Mean Square	F	Sig.
Campus design	Between Groups	6.551	4	1.638	6.141	<.001
	Within Groups	97.064	364	.267		
	Total	103.615	368			
Sense of Place	Between Groups	4.148	4	1.037	7.984	<.001
	Within Groups	45.327	349	.130		
	Total	49.475	353			
Student Engagement	Between Groups	1.391	4	.348	2.568	.038
	Within Groups	49.551	366	.135		
	Total	50.942	370			

Note: This table presents one-way analysis of variance summary comparing classification of undergraduate students on campus design, sense of place, and student engagement scales.



## Research Question Seven

How well does the combination of sense of place, campus design, gender, racial/ethnic identity, and enrollment status (full-time/part-time) predict student engagement?

**H<sub>0</sub>7:** There is no combination of sense of place, campus design, gender, racial/ethnic identity, and enrollment status (full-time/part-time) that predicts student engagement.

Simultaneous multiple regression was conducted to determine the best linear combination of sense of place, campus design, gender, racial/ethnic identity, and enrollment status for predicting student engagement. (Assumptions of linearity, normally distributed errors, and uncorrelated errors were checked and met). The means, standard deviations, and intercorrelations can be found in Table 4.10.

Table 4.10

### *Descriptive Statistics for Multiple Regression Analysis*

Variable	M	SD	1	2	3	4	5
Student Engagement	2.67	.37	.46**	.36**	.23**	.04	.18**
Predictor Variable							
Sense of Place	2.63	.37	-	.51**	.23**	-.11*	.17*
Campus Design	3.06	.53		-	.11*	-.12*	.10*
Gender	.69	.46			-	.09	.10*
Racial/Ethnic Identity	4.52	1.63				-	-.07
Enrollment Status	.94	.23					-

\*p<.05; \*\*p<.01; Note: This table presents the means, standard deviations, and intercorrelations for student engagement and predictor variables (N = 352)

This combination of variables significantly predicted student engagement, ( $F(5,346) = 24.88, p < .001$ ), with all five variables significantly contributing to the prediction. The adjusted R squared value was .256. This indicates that 25.6% of the variance in student engagement was explained by the model. According to Cohen (1988), this is a typical effect size. The beta weights, presented in Table 4.11, suggest that sense of place contributes most to predicting student engagement in this model, and that good campus design, gender, ethnicity and enrollment status also contribute to this prediction.

Table 4.11

*Simultaneous Multiple Regression for Student Engagement*

Variable	B	SEB	Beta
Student Engagement			
Predictor Variable			
Sense of Place	.327	.055	.329**
Campus Design	.129	.038	.185*
Gender	.092	.038	.114*
Racial/Ethnic Identity	.022	.011	.095*
Enrollment Status	.158	.075	.099*

Note: Adjusted  $R^2 = .256$ ;  $F(5,346) = 24.88, p < .001$ ; \* $p < .05$ ; \*\* $p < .01$ ; This table presents the Simultaneous multiple regression summary for student engagement and its predictor variables ( $N = 352$ ).

### Issue of Non-response Bias

Additional analyses were done to investigate whether nonresponse bias exists between respondents and non-respondents. Non-response bias exists when respondents and non-

respondents are systematically different in terms their demographic characteristics or variables important to a survey topic (Dillman et al., 2009).

The low survey response rate raised the issue of a nonresponse bias. In order to investigate if the survey respondents were representative of the entire sampling frame of 6,000, nonresponse bias testing was done by comparing early and late responders' socio-demographics variables as well as their responses on the sense of place, campus design and student engagement scales. There were three groups of respondents: the first group (N = 226) consisted of the respondents to the initial invitation sent on March 6, 2013; the second group (N = 166) responded to the first reminder sent on March 12, 2013; and the third group (N = 132) responded to the second reminder sent March 26, 2013. The results compared the respondents to the initial invitation and those that responded after the second reminder. These later respondents were treated as proxies for non-respondents. The following are the results:

**Gender.** To investigate whether males and females differed based on their classification as respondents or non-respondents, a chi-square test was conducted. Assumptions were checked and met. Pearson chi-square results indicated that males and females were not significantly different in terms of their response group ( $\chi^2 = .102$ ,  $df = 1$ ,  $N = 312$ ,  $p = .75$ ). Both groups had similar proportions of male and female cases, with 71 males (31.8%) and 152 females (68.2%) in the first group, and 30 males (33.7%) and 59 females (66.3%) in the 'non-respondent' group. Therefore, there is no significance difference in gender.

**Race.** A chi-square analysis revealed no statistically significant difference between the number of white students and the number of non-white students (African-Americans, Hispanics, Asians, and others) ( $\chi^2 = 14.135$ ,  $df = 9$ ,  $N = 311$ ,  $p = .118$ ).

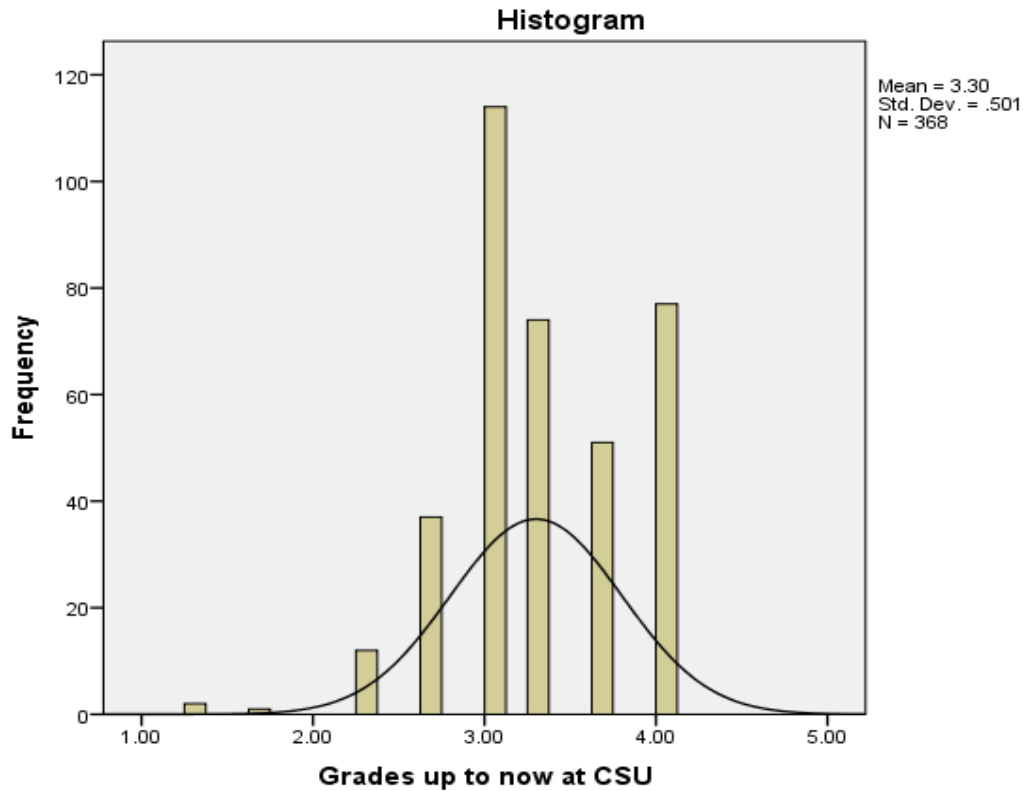
**Age.** A chi-square test revealed no statistically significant difference between respondents and non-respondents in terms of the distribution of respondents in the four different age groups. Among respondents the counts were: 62 (27.8%) for age 18-19; 76 (34.1%) for age 20-21; 52 (23.3%) for age 22-23; and 33 (14.8%) for age 24 or older. Among non-respondents, the counts were: 27 for age 18-19 (30.3%); 32 (36%) for age 20-21; 19 (21.3%) for age 22-23; and 11 (12.4%) for 24 or older. ( $\chi^2 = .585$ ,  $df = 3$ ,  $N = 312$ ,  $p = .90$ ). Phi, which indicates strength of the association between the two variables, is .043. This is very weak effect size.

**Place of residence.** A chi-square test did reveal a statistically significant difference in the count for place of residence among respondents and non-respondents ( $\chi^2 = 9.581$ ,  $df = 4$ ,  $N = 310$ ,  $p = .048$ ). Phi is .176. Comparing respondents and non-respondents in terms of their current place of residence, 25.8% ( $n = 57$ ) of the respondents group lived in on-campus housing versus 23.6% ( $n = 21$ ) of non-respondents. Also, 0.9% ( $n = 2$ ) of all respondents lived in fraternity houses as against 6.7% ( $n = 6$ ) for non-respondents. The results also showed that 30.8% ( $n = 68$ ) of respondents versus 33.7% ( $n = 30$ ) of non-respondents lived in private apartments or residences within walking distance to the CSU campus; 40.3% ( $n = 89$ ) of respondents versus 34.8% ( $n = 31$ ) non-respondents lived in private residences farther than walking distance from the CSU campus. And 5 out of 221 respondents (2.3%) did not indicate where they lived as opposed to 1 out of 89 non-respondents (1.7%). In general, respondents and non-respondents were similar in terms of the percentage of each group that lived in campus housing or private housing close to campus. These same proportions were different for those living in fraternity housing but the total count was low ( $n = 8$ ), and not sufficient to make a judgment. However, more respondents lived at private housing farther than walking distance from the CSU campus than non-respondents. This was quite interesting.

***US or International Student.*** A chi-square analysis revealed no statistically significant difference between respondents and non-respondents in terms of their status as international students or U.S. students ( $\chi^2 = .711$ ,  $df = 1$ ,  $N = 311$ ,  $p = .399$ ). Four (1.8%) of the respondents were international students and 218 (98.2%) were U.S. students. Among non-respondents, three (3.4%) students were international and 86 (96.6%) were U.S. Students.

***Enrollment Status.*** A chi-square test revealed that respondents and non-respondents were not significantly different on whether or not they were enrolled full-time or part-time ( $\chi^2 = 2.523$ ,  $df = 1$ ,  $N = 310$ ,  $P = .112$ ). Phi was .09. Among respondents, there were 206 (93.2%) full-time students and 15 (6.8%) part-time students. Among non-respondents, there were 87 (97.8%) full-time students and two (2.2%) part-time students.

***Grade Point Average.*** Assumptions of normality were not markedly violated, so independent samples t-test was conducted to compare grade point average between respondents and non-respondents. The test revealed that respondents were not significantly different from non-respondents in terms of their grade point average ( $p = .476$ ). Inspection of the two group means indicated that the mean GPA of respondents ( $M = 3.291$ ) was not significantly higher than the mean GPA ( $M = 3.2472$ ) of non-respondents. The difference between the mean GPA was .0436 on a four-point scale.



*Figure 4.6.* Grades Histogram with Superimposed Normal Curve

To compare respondents' and non-respondents' scores on key variables in the study, independent samples t-test was done on sense of place, campus design, student engagement, and engagement indicators for the two groups. Table 4.12 shows that a statistically significant difference exists in the mean scores of sense of place for the two groups, but no significant difference in the campus design and student engagement scores.

Table 4.12

*Comparison of Respondents and Non-respondents*

Variable	N	M	SD	t	df	p	d
Sense of place				-2.452	309	.015	.30
Respondents	213	2.572	.389				
Non-respondents	98	2.684	.343				
Campus design				.393	313	.694	.05
Respondents	223	3.065	.571				
Non-respondents	92	3.038	.481				
Student engagement				-1.057	324	.292	.13
Respondents	224	2.648	.365				
Non-respondents	102	2.695	.393				

Note: This table shows summary of the comparison of respondents and non-respondents on key variables: sense of place (n=213 respondents and n=98 non-respondents), campus design (n=223 respondents and n=92 non-respondents) and student engagement (n=224 respondents and n=102 non-respondents).

Some researchers contend that nonresponse bias can exist even when there is a high response rate, suggesting that nonresponse bias should always be tested regardless of the response rate (Miller & Smith, 1983). The low response rate for this study elevated the issue of nonresponse bias, which is one of the possible types of survey error (Dillman et al., 2009). Nonresponse bias was a threat to external validity of the study (Lindner, Murphy, & Briers, 2001). According to Lindner et al. (2001), “Three statistically sound and professionally acceptable procedures and protocols for handling nonresponse are: Method 1 – Comparison of Early to Late Respondents; Method 2 - Using “Days to Respond” as a regression variable; and Method 3 - Compare Respondents to Nonrespondents” (Lindner et al., 2001, p. 43).

The third method requires additional survey or polling of non-respondents, obtaining their responses, and then comparing their responses to those of respondents. This is considered the most acceptable way of addressing nonresponse bias. However, it requires the investment of more time and energy to obtain a sufficient sample of non-respondents for a follow-up study. The second method of using “days to respond” is deployed as a continuous independent variable in a regression equation in which primary variables of interest are regressed based on “days to respond.” In this case, non-respondents are linearly extrapolated from the regression model. The first method mentioned, comparing early respondents to late respondents, was used in this study. Like the “days to respond” approach, it is an extrapolation method in which non-respondents are considered a linear extension of those who responded the latest (Lindner et al., 2001).

Both of these extrapolation methods have the advantage that all of the data could be gathered at once. In this study, it was important to operationally define late respondents as those who responded only to the second reminder. The second reminder was sent two weeks after the first, by which time, the responses from the initial wave of respondents from the first reminder had died down. Respondents were operationally defined as those who responded to the initial invitation.

Findings were mixed as to whether the study respondents ( $n = 223$ ) were representative of the non-respondents within the sampling frame ( $n = 6,000$ ), where the late respondents ( $n = 89$ ) were used as proxies for the non-respondents. Lindner et al. (2001) recommended a minimum sample size of thirty for non-respondents in doing nonresponse bias testing. The study respondents were representative of the sampling frame non-respondents in terms of race, gender, age, status as an international or United States student, and GPA, but not for the socio-demographic variable of “place of residence.”



Proportionately, there was little difference between respondents and non-respondents for students who lived in campus housing (not a fraternity or sorority house), and non-campus residences within walking distance of campus. There were proportionately more non-respondents than respondents among those who lived in fraternity or sorority house. And, proportionately more respondents indicated that they lived at off-campus residences farther than walking distance from the CSU campus than non-respondents. Similarly, more respondents chose the option “none of the above” than did non-respondents. This seems counterintuitive since those living farther away from the campus would have less time and so would be less likely to respond to surveys. So there must be some other explanation that a mixed methods study would typically uncover since the follow-up interviews would provide opportunity for further exploration. When these mixed results are grouped, in terms of on-campus versus off-campus residence, they are proportionately similar with 74.3 percent of respondents living off campus and 76.3 percent of non-respondents living off-campus.

This data suggests that there is no significant difference between respondents and non-respondents on these socio-demographic variables. Therefore, no evidence of nonresponse bias was found and it can be concluded that the respondents were reasonably representative of the surveyed population in terms of these demographic variables.

No evidence of non-response error was found in the study in general. In order to be sure, it was necessary to go beyond socio-demographic variables and examine key variables that were central to purpose of the study. This is key because nonresponse error “results when people selected for a survey who do not respond are different in a way that is important to the study from those who do respond” (Dillman et al., 2009, p. 19). Sense of place and student

engagement indicators were certainly central to the study, so these variables were compared for respondents and non-respondents.

No statistically significant differences were found between the mean scores for student engagement and campus design among the respondents and non-respondents. Concerning the five engagement indicators (academic challenge, learning with peers, experience with faculty, campus environment and high impact practices), there were no significant differences in the mean scores of respondents and non-respondents. But, a significant difference was found between respondents' and non-respondents' mean scores for sense of place. Therefore, there is evidence of non-response bias for sense of place. Given the higher scores by the non-respondents than the respondents, it can be inferred that non-respondents reported having a greater sense of place or bonding with the CSU campus. This finding goes against the suggestion that people who are interested in a topic are more likely to respond than those who are not (Groves, Presser, & Dipko, 2004).

## **Chapter 5: Discussion and Conclusions**

This chapter presents a summary of the study and important conclusions drawn from the data presented in chapter four. It also provides a discussion of the implications from these conclusions and possible future actions and recommendations for further research.

The purpose of this quantitative study was to examine the relationship between student engagement and sense of place, as an attitude to the physical environment. Results were obtained through surveying a stratified random sample of undergraduate students at Colorado State University. The study used The National Survey of Student Engagement (NSSE), a higher education assessment instrument developed to measure engagement through a student self-reporting process. This instrument consists of five engagement indicators (academic challenge, learning with peers, experience with faculty, campus environment, and high impact practices), which was modified to include additional items to assess sense of place and campus design. These indicators draw on more than seventy years of scholarships, including Pace's (1979) *Quality of Effort*, Astin's (1999) *Theory of Involvement*, Chickering and Gamson's (1987) *Principles of Good Practice*, Tinto's (1993) *Theory of Student Departure*, and Ewell and Jones's (1996) *Indicators of Good Practice*.

### **Summary of Findings**

Student engagement had statistically significant relationships with both sense of place and campus design. The study found that sense of place, treated as a uni-dimensional construct, was a more stable measure than the presumed three dimensions of sense of place. In other words, only one factor is extracted from the factor analysis when eigenvalue is set at one which is typical. This suggests that sense of place has only one dimension. Three factors were extracted from the factor analysis only when they were specifically requested, and two of the three factors

had eigenvalues less than one. Despite these results, the three dimensions of sense of place under investigation (place attachment or place-based affect, place identity, and place dependence) could not be ruled out. A reliable scale for assessing campus design was also developed, with the NSSE instrument found to be a reliable instrument for assessing student engagement in this study. In turn, sense of place was found to have a statistically significant relationship with campus design. Sense of place, and campus design were found to be significantly associated with all the engagement indicators, except that no statistically significant relationship was found between campus design and “High Impact Practices.” Student engagement and all the engagement indicators were significantly related to grades, but sense of place and campus design had no statistically significant relationships with grades. Finally, the study found no evidence of nonresponse bias.

A model combining sense of place, campus design, gender, racial/ethnic identity, and enrollment status was found to predict student engagement. The model predicts more than twenty-five percent of the variance in student engagement, with all variables contributing significantly. The study also found that students’ assessment of sense of place and campus design declined steadily from their first year through their junior year before making a recovery in the senior year. This finding suggests the existence of two kinds of sense of place, namely, *fleeting sense of place* and *enduring sense of place*. The fleeting kind develops quickly, but wanes over time. The enduring kind may not exist at first but develops and gets stronger over time as an individual interacts closely with a physical setting.

## **Discussion and Conclusions**

### **Survey Response Rates**

The sample consisted of 524 student respondents out of a sampling frame of 6,000; this was an 8.73 percent response rate. Specific item response rates varied from 6.35 percent to 6.95 percent. This is a very low response rate, even accounting for the steady decline in student survey response rates over the years. Dey (1997), for example, reported declining response rates from a high of 65 percent in the early 1960s to 21 percent in the 1990s. Response rates from the recent NSSE survey ranged from a low of 14 percent to a high of seventy percent (NSSE, 2012). Response to web surveys typically range from five to twenty percent (Dillman et al., 2009), and the response rate for this study fell within this range, but it was still a surprise that the response rate was so low. Contributing factors to the low response rate may have included the fact that the IRB office at Colorado State University limited the number of contacts the researcher was permitted to make with potential respondents to three, and a lack of incentive to participate. Moreover, the survey was long and may have caused some respondents to drop out. Pre-survey notification, which was not done for this study, would probably have boosted the response rate because it would have alerted students of the survey in advance and what to expect. Also, dividing the sample frame into two or three in order to prolong the survey period with multiple reminders, without contacting each student more than three times, would probably have also improved the overall response rate.

More respondents typically yield better quality data, but other measures of data quality were examined in light of the low response rate. In addition to response rates and total completions, the measures of data quality include aspects of sampling error and representativeness (Cook, Heath, & Thompson, 2000; Dillman, 2009). Representativeness of the

sample was addressed under “Issue of Nonresponse Bias” in chapter four, but the sample size was found to be adequate based on a priori power analysis. Different statistical tests required different minimum sample sizes ranging from a low of 24 cases for ANOVA (with repeated measures, within factors, and two groups) to a high of 343 cases for a linear bivariate regression. In all these instances, power was .8 or 80%, alpha error probability was .05 or 5%, with medium a effect size. For factor analysis, a sample size of 300 is considered good (DeVellis, 2012). So, although the response rate was low, the sample size was adequate for the analyses conducted. Therefore, generalizability depends on representativeness of the sample.

### **Scale Development and Reliability**

Developing an instrument was necessary to assess sense of place and student engagement because no such instrument was found in the literature. This study employed the National Survey of Student Engagement (NSSE) instrument as a starting point, and then modified it by adding sense of place and campus design items. The sense of place items were developed based on reviewing the literature. Some of the key issues in sense of place research identified from the literature were a lack of agreement on: (a) its dimensionality; (b) how these dimensions are defined; and (c) the relationship between them (Stedman, 2003b). To further investigate these issues, exploratory factor analyses were conducted on the sense of place items alone, and then on all of the new instrument items together.

**Exploratory factor analysis.** Exploratory factor analysis of the sense of place items yielded three factors only when specified, otherwise, one factor was extracted based on eigenvalue of one. Two of the items displayed eigenvalues of less than one. These two factors together explained 14.4 percent of the variance in sense of place, whereas one of the three factors, alone, predicted 56.1 percent of the variance. Although three factors were extracted

when requested, the item loadings on the three factors did not align with the “place attachment,” “place identity,” and “place dependence” constructs drawn from the literature.

Three of the four items loaded on sense of place Factor One, which was labeled as “place identity” items under the original sense of place scale. The items were: “The CSU campus is a reflection of me”; “This campus says very little about who I am”; and “This campus reflects the type of person I am.” Fittingly, these items aligned on the “place identity” subscale and sense of place Factor One. The last item that loaded on Factor One was, “This campus provides many of the opportunities to engage in my favorite activities,” and belonged to the “place dependence” dimension in the original scale. It is logical to consider a place that “provides many of the opportunities to engage in my favorite activities,” as one that is “a reflection of me,” as well as a place that “reflects the type of person I am.” So, one can conclude that these three items do indeed measure the same underlying construct – place identity. Place Identity and Factor One have good internal consistency reliability and similar alpha values. The alpha values for place identity (in the original scale) and Factor One (post-EFA) are 0.83 and 0.86, respectively.

In contrast, Factor Two combined one place identity item with two place attachment items; and Factor Three combined one place dependence item with two place attachment items. These combinations are more difficult to interpret. Perhaps the items are subject to multiple interpretations and will have to be refined further. However, it can be concluded that the excellent internal consistency reliability of the sense of place scale, as a uni-dimensional construct, makes sense of place more uni-dimensional than multi-dimensional in this study. This does not mean that sense of place as a multi-dimensional construct can be ruled out. What remains unclear is exactly what these dimensions are.

Thus, when factor analysis was run with the eigenvalue set at one, only one factor, with all eleven sense of place items loaded, was extracted and it accounted for 56.2 percent of the variance. Hence, sense of place appeared to be uni-dimensional when the eigenvalue was 1 or higher. Factor analysis of the entire instrument yielded thirteen factors, with sense of place loading as one factor, campus design items loading as one factor, and the remaining items loading on the other eleven factors of student engagement as expected. Thus, factors two, three, and five through thirteen (see Table 4.4) represent student engagement items.

There were two minor misalignments of items on the student engagement scale. First, the “Quality of Interactions with Students” item dropped from the *Quality of Interactions* subscale in the original scale and loaded on *Collaborative Learning* in the modified scale. Given that *Collaborative Learning* deals with how students learn together, it is logical that the *Quality of Interactions with Students* item could double load on these two subscales because both address aspects of students’ interactions. Two out of the original items under *High Impact Practices* were suppressed because of low factor loading. The conclusion from the factor analysis was that the structure and dimensions of the student engagement portion of the instrument aligns almost perfectly with the NSSE instrument, as was expected.

## **Relationships Among Variables and Test of Hypotheses**

### **Research Null Hypothesis One**

Research Null Hypothesis One stated that there was no statistically significant association between sense of place and student engagement among undergraduate students at CSU.

The data suggested a significant association between sense of place and student engagement. Hints of an indirect relationship between sense of place and student engagement were found in the literature, but without empirical evidence to support them. First, the literature



suggested that the physical environment (built and natural) influences behavior and attitudes (Kinzie & Kuh, 2007; Strange & Banning, 2001a). In the course of an individual's interaction with the physical space, sense of place may manifest as attachment that develops with the physical space itself (Kyle et al., 2005), or any feature of the environment such as landscapes, art objects and buildings (Cresswell, 2004). Also, the physical attributes of a space can encourage use and eventually lead to attachment (Norberg-Schulz, 1985), and a degree of attachment can be developed through visual appreciation of the characteristics of a setting (Tuan, 2001). Sense of place is, in turn, presumed to influence persistence and loyalty to the institution (Kinzie & Kuh, 2007).

Second, the physical environment of a college campus is the theater in which student engagement takes place. Pace (1982) described this as a behavior setting, which is a place or physical setting in which certain types of activities typically occur in the college environment. These include facilities such as libraries, classrooms, cultural centers, student unions, and other campus buildings and grounds. Engagement activities that make up the engagement indicators such as "learning with peers," "experience with faculty," "academic challenge," or "high impact practices" are made possible by these behavior settings. When students arrive at college they are expected, and even required, to take part in certain activities while others are optional. All of these activities, such as doing group project with peers take place in any one of these campus behavior settings. In the course of frequenting these facilities students may develop sense of place because of their attachment to the physical spaces, objects or artifacts within them or their experiences within them.

Tuan (2001) suggested that to sense a place is to experience it through the five senses of sight, sound, touch, taste and smell. The visual attachment may happen quickly, but attachment

based on the other four senses may take time to develop. Hence, frequency of use may strengthen sense of place. Whereas at first students may start going to a space or behavior setting because they have to, once they develop a stronger sense of place, such a place becomes one where they want to be. An increased sense of place leads to a feeling of well-being. The more a person enjoys a place, the more they are likely to be involved in the activities that take place therein. Greater involvement in these engaging activities leads to greater engagement. Student engagement, in turn, has been linked to persistence and retention (Krause, 2005; Kuh et al., 2008a), and affinity with the institution (Bensimon, 2009).

In summary, the physical environment does influence student engagement and sense of place. As a behavior setting, the physical space is where engagement activities take place. This physical space becomes a place when it is imbued with meaning through the experiences of the students using it. Whether the meaning ascribed to this space is due to the social interaction and intellectual exchange it fosters, or the symbolic meaning it represents, once sense of place is enhanced, greater use is likely. Hence, as sense of place gets stronger students are more likely to become more engaged.

Both sense of place and student engagement are also presumed predictors of persistence and retention. Given these indirect connections, it is logical to infer that a direct relationship between sense of place and student engagement is highly probable. Such a direct relationship was not found in existing literature. Therefore, this study provides preliminary empirical evidence for the myriad suggestions that sense of place is strongly related to student engagement.

## **Research Null Hypothesis Two**

Research Null Hypothesis Two stated that there was no statistically significant relationship between campus design and student engagement among undergraduate students at CSU.

The data suggested a statistically significant association between campus design and student engagement, so the null hypothesis was rejected. This finding is in agreement with Dober's (2003) conclusion that the campus can be intentionally designed to enhance involvement in the activities that promote learning. Kuh (2009a) defined student engagement as "the time and effort students devote to activities that are empirically linked to desired outcomes of college and what institutions do to induce students to participate in these activities" (p. 683). These engagement activities take place within behavior settings that are physical campus facilities such as union buildings or campus student centers, libraries, classrooms, recreational facilities and others (Pace, 1982). Not only must these facilities be available to afford students the opportunity to use them, but they also must be designed in such a way as to induce students to use them. For example, a library that is not located within easy reach of major centers of student activities on campus or along major pedestrian paths are not likely to attract as many patrons as those located along vibrant campus paths or nodes of activities. In discussing the model of the university as a market place, Alexander, Ishikawa, and Silverstein (1977) pointed out the importance of strategically locating campus facilities and specifically designing them to encourage access and use:

Physically, the university market place has a central crossroads where its main buildings and offices are, and the meeting rooms and labs ripple out from this crossroads – at first

concentrated in small buildings along pedestrian streets and then gradually becoming more dispersed and mixed with the town (p. 234).

Even when a facility is well located on campus to encourage use, the specific design of buildings and landscapes must function well for the variety of engagement activities that they are expected to host. Staying with the library example, if it is designed with only quiet reading rooms where noise of any kind is not tolerated, then it will discourage use by a group of students who want to work together on a class project. If a space is too hot or too cold or permits excessive glare or is too dark, less students would want to be there. Studies have also shown that the color chosen for spaces behavior, attitudes and even level of productivity (Jalil, Yunus, & Said, 2012).

On the other hand, a campus library on a well-travelled campus path, with entries that are easy to find and transparent walls at the pedestrian level is more likely to be entered into. If this library has a coffee shop like a “Starbucks,” information commons where students can gather to find and exchange information or share their desktops so others could see what is on their screen, with internet access and power readily available everywhere, glass-walled study rooms and conference spaces to permit group work on projects, quiet study areas and a few active learning classrooms, then the likelihood of use would be high. Not only does a space like this allow different groups of students to engage in different kinds of learning activities at the same time, but it also allows individuals to engage in a variety of engaging activities at different times in the same facility. Such a place combines the “third place” as described by Oldenburg (1999), quiet study spaces, formal classroom spaces, meeting rooms, and places for serious research, together with all the tools and amenities to get work done. In addition, the spaces could be designed to afford good natural lighting, spatial appropriateness in terms of their relationship to human scale,

comfortable seating, and appropriate colors for various spaces. This is one way the institution could induce students to take full advantage of the facilities it provides to foster student engagement.

Great campus places can be designed so that students frequent them, spend long periods of time there, and also become more involved in the activities that such behavior settings make possible. A tiered classroom designed for lecture delivery does not allow students to comfortably gather around to work on common projects. Hence, the preliminary finding that campus design is significantly associated with student engagement aligns with current research on student engagement.

### **Research Null Hypothesis Three**

Research Null Hypothesis Three stated that there was no statistically significant relationship between campus design and sense of place among undergraduate students at CSU.

The data showed a significant association between campus design and sense of place, so this null hypothesis can be rejected. This finding was expected, and it is in agreement with Dober's (2003) and Kinzie's (2007) conclusions that sense of place can be enhanced through the intentional design of campus architecture. Therefore, buildings and landscapes can be designed in a manner that engenders attachment (Alexander, 1979; Alexander et al., 1977; Salingaros, 2006).

One of the objectives of design is to create or enhance beauty. The roman architect Vitruvius considered the ideal building to be one that is structurally sound, useful in as much as it functions well for its purpose, and beautiful (Vitruvius, Sangallo, Rowland, & Accademia nazionale dei Lincei, 2003). Humans are attracted to beautiful people and things including

buildings and landscapes. A beautiful place immediately engages the eye as does an ugly place. The difference is that a beautiful place causes the human emotion to initiate that process of attachment. As stated, Tuan (2001) pointed out that humans sense a place through the five senses; that process may begin with aesthetic appreciation of the place. This visual aspect of sense of place can happen quickly, and over time attachment through the other senses may develop. Studies have shown that the majority of prospective college students make their decision about what college they want to attend based on the visual environment of the campus (Boyer & Carnegie Foundation for the Advancement of Teaching., 1988; Kenney et al., 2005; Strange & Banning, 2001a). Designing a campus to be beautiful enhances its sense of place by making the visual impact stronger.

Another aspect of good design is that it must function well for its intended use. People will likely gravitate towards a place that is designed to afford them the opportunity to do the kinds of things they love to do. This represents a dimension of sense of place referred to as place dependence; it is the extent to which individuals perceive themselves to be strongly associated with, and dependent on a particular place (Moore & Graefe, 1994). Meanwhile, there are campus spaces that are intended for use as civic spaces but are not actively used. Why do some spaces attract heavy use by people and others do not? In studying the social life of small urban spaces, Whyte (1980) concluded that spaces can be intentionally designed to be active and well used. He found that providing seating, configured and located in particular ways, sized appropriately, with a variety of options made available, would encourage people to sit; he also found that relationship of plazas to the street, sun and light, food, water and trees were important ingredients in activating public spaces. And, objects and artifacts, such as sculptures or public acts, which bring people together and become the subject of conversation between strangers, are

also important in activating public spaces. Whyte (1980) referred to this as *triangulation*, where two or more people who would ordinarily have nothing to talk about can start discussing some object, event, or act that is of common interest to them.

The social life of public spaces in a city is an indicator of the liveliness of the city. Likewise, the social life of a college campus can be assessed by the social life of its civic spaces. A campus visit quickly reveals to prospective students whether or not a campus is a good fit. One of the considerations students give to their choice of college is whether it affords them opportunity for social interaction and to do the kinds of things that are important to them.

Another aspect of sense of place that is linked with campus design in the literature is the identity of a place. This refers to the distinctiveness of individual places, as well as the sameness of different places (Relph, 1976). In other words, what makes a place distinctive may also be what makes it recognizable as part of a group. Earlier, Lynch (1960) described identity of a place as the quality that distinguishes it from other places and makes it recognizable as a separable entity. For example, the union terrace at the University of Wisconsin in Madison, on the shore of Lake Mendota, is a place like no other; it is a place where the natural setting is married to the built form to give it a spirit of its own. The lake helps to make this place unique by serving as a differentiator, but it also gives this place commonality with other lakeshore civic spaces. Whether such great places that enhance sense of place were arrived at by accident or by intentional design, what is clear is that designers are learning what works and can replicate the essence of such places.

#### **Research Null Hypothesis Four**

Research Null Hypothesis Four stated that there were no statistically significant associations between components of sense of place (place attachment or place-based

affect, place dependence, and place identity), campus design, and the following engagement indicators: academic challenge, learning with peers, experiences with faculty, campus environment, and high-impact practices.

The results found significant associations between 34 of the 36 pairs of variables derived from combinations of these nine variables. There was no significant association between learning with peers and place dependence; and there was also no statistically significant association between campus design and high impact practices.

Learning with peers has two components: diverse interactions and collaborative learning. Diverse interactions explores how often students have had serious conversations with people who differ from them in terms of political views, economic and social background, religious beliefs or philosophy of life, race, ethnic background, or country of origin and sexual orientation. Place dependence refers to the extent to which people perceive themselves to be strongly associated with, and dependent on a particular place (Moore & Graefe, 1994). Given the definitions of place dependence and diverse interactions, it is logical to understand how these two variables may not be associated. For instance, with respect to diverse interactions, an individual's level of comfort addressing certain topics would likely influence whether or not one decides to have such conversations, and would have little or nothing to do with whether or not a space is designed well.

However, the other component of Learning with peers, collaborative learning, deals with how often students collaborated with fellow students by asking for, or giving help regarding course material, preparing for exams together, or working with other students on projects or assignments. It seems logical that students who gather to collaborate would likely develop place dependence for their gathering place. But no correlational analysis was done to investigate how



the components of the various engagement indicators relate to components of sense of place. Moreover, no research linking learning with peers and place dependence was found.

Similarly, the variable, high impact practices, was not expected to correlate with campus design. The items that make up high impact practices were not designed to hang together as a scale. Instead they were to be employed individually to assess the impact of each item on other measures. But these items still fell under one theme.

Regarding the statistically significant associations between thirty-four pairs of variables, no previous research linking these variables was found. Since sense of place was found to have a statistically significant association with student engagement, these findings appear logical.

### **Research Null Hypothesis Five**

Research Null Hypothesis Five stated that there were no statistically significant associations between components of sense of place, campus design, the five NSSE engagement indicators (academic challenge, learning with peers, experiences with faculty, campus environment, and high-impact practices), and Grade Point Average (GPA).

The data showed significant associations between GPA and the five engagement indicators: academic challenge, learning with peers, experience with faculty, campus environment, and high impact practices. The strengths of these associations were weak. Nonetheless, student engagement was significantly associated with grades. This conclusion aligns with the study by Kuh, Cruce, Shoup, Kinzie, & Gonyea (2008b) which found student engagement in educationally purposeful activities to be positively related to first-year student grades. The weak strength of association in this study may be, in part, due to the aggregation of

all the students in the study without differentiating them by classification. Since GPA is cumulative, grades in the senior year would have to be isolated to make the analyses more meaningful. The relationship between sense of place, campus design, student engagement and GPA would be clearer if the analyses are broken down by classification and the grade point averages restricted by classification. It would be interesting to examine the same relationship with first-year students, if only to see how it compares with the Kuh et al. (2008) study.

However, no statistically significant relationships were found between sense of place (and its dimensions – place attachment or place-based affect, place identity, and place dependence) and GPA. But, since sense of place was found to be significantly associated with student engagement, which is associated with grades, any relationship between sense of place and grades can only be indirect. Similarly, campus design had no statistically significant relationship with grades, but was significantly related to these key engagement indicators: academic challenge, learning with peers, and experience with faculty and campus environment. The lack of association between sense of place and GPA, as well as between campus design and GPA, is understandable. Nothing in the tests that students take or their professors' expectations is likely to be influenced by the emotional bond students have with their campus (sense of place) or how well the campus is designed.

The pattern that has emerged is that campus design impacts sense of place, which, in turn, is associated with student engagement. Student engagement has significant association with GPA, albeit weak. A more important correlation, that was not within the scope of this study, is the positive association between student engagement and persistence from first to second year of college (Kuh et al., 2008b). It is clear that more studies should be done at a more micro level

within these variables to better understand the interactions of their parts since each is composed of a number of items, which in themselves could be treated as variables.

### **Research Null Hypothesis Six**

Research Null Hypothesis Six stated that there were no statistically significant differences among the four classifications of undergraduate students on their campus design, sense of place and student engagement scores.

The data suggested a statistically significant difference among the four levels of classification of undergraduate students on campus design, sense of place, and on student engagement. A cursory examination of the data reveals an identical response pattern for campus design and sense of place. Scores for assessing campus design and sense of place were highest among freshmen, decreasing through the sophomore year until reaching a minimum score in the junior year, before trending upward in the senior year. In both these instances, scores for freshmen and sophomores were higher than scores for juniors and seniors. Similarly, student engagement scores were the same for freshmen and sophomores, lowest for juniors, but were highest among seniors. What stood out from examining all three constructs by student classifications was that the scores among juniors were consistently lowest for campus design, sense of place, and student engagement.

While the difference between engagement scores of first year students and seniors was not significant in this study, the trend is consistent with results of the National Survey of Student Engagement (NSSE, 2012c). The trend showed that seniors consistently recorded higher scores than first-year students on four out of the five engagement benchmarks prior to 2013. These are level of academic challenge, active and collaborative learning, student-faculty interaction, and enriching educational experiences. But when it comes to rating how supportive students think

their campus environments were, first-year students rated their campuses higher than seniors. However, this study did not compare specific indicators. Moreover, the engagement indicators upon which the current study is based are slightly different from the benchmarks on which pre-2013 administrations of the NSSE were based.

Regarding campus design and sense of place, no prior studies were found that examined students' assessment of campus design and sense of place based on their classifications. Differences in assessment of campus design were significant between first-year students and juniors, and between first-year students and seniors. With respect to sense of place, first-year students differed significantly from sophomores, juniors and seniors in their assessment of how attached to the campus they were. It seems reasonable to suggest that the physical features of a campus, as well as the atmosphere that makes students feel like they could belong there, are not only factors that help sway students in their college choice, but also reflect their initial attachment to the place or a measure of their sense of place. As previously stated, research has shown that a majority of prospective college students base their choice on the visual appearance of the campus (Boyer & Carnegie Foundation for the Advancement of Teaching., 1988; Kenney et al., 2005; Strange & Banning, 2001a).

But over time, as students get to know their campus better and understand some of the things that do not work so well for them, the luster may begin to wear off, and the emotional bond to the place weakens. Tuan (1979) suggested that sense of place has two meanings: one deals with the visual or aesthetic impact and the other deals with the other four senses. A beautiful campus is likely to have immediate visual impact that may lead to attachment to the campus and perception of a well-designed campus. Visual or aesthetic attachment to a place can

happen quickly, but to sense a place through the other four senses of hearing, touch, smell, and taste requires an individual to interact closely with that environment over a long time.

It appears that as students interact closely with a campus, what they hear, smell, touch and taste does not measure up to the visual beauty of the place, hence the decrease in the level of attachment to campus and perceptions of how well it is designed. This is possibly like love at first sight based on an assessment of how beautiful the object of one's love is. Over time, as the two lovers begin to interact closely, they begin to discover issues they may struggle with, thereby dampening the initial excitement. If their love survives the initial decline, it is likely to last longer and grow stronger. Therefore, it is important to investigate qualitatively what drives down the level of attachment to campus or perception of a well-designed campus as students' progress from their first-year through their junior year, before rising in their senior year.

Perhaps this relates back to the initial discussion in the chapter of a *fleeting sense of place* and an *enduring sense of place*. The fleeting kind deals with the bond that is based on the visual appreciation for a place. It comes quickly and dissipates quickly, unless there is an intervention to arrest this decline. However, as students begin to interact with their new environment and start sensing the place through sound, taste, touch, and smell, overall sense of place starts recovering from a downward trend. It is possible that the *fleeting sense of place* remains strong, or even constant, if a student does not interact with the campus environment at all after the initial contact. In this scenario, lack of further interaction may keep the image of the place strong in one's mind, because it would remain an ideal setting. Close interaction with a place reveals the good, the bad, and the ugly, and may erode the ideal picture of the place that was created by the initial strong visual impact. Hence, the strong visual impact is initially weakened by knowledge of the place, until one begins to develop stronger attachment through use and the social bonds one develops. It

appears from the sense of place versus classification graph (see Table 4.4) that this turning point occurs in the junior year. This raises an important question as to what interventions are possible to minimize the decline of sense of place. Also, what are the implications of the rise in sense of place in the senior year of college for alumni affinity? It would be interesting to track seniors for years after they graduate to assess whether their sense of place continues to rise as alumni. This may be significant for development staff in terms of fundraising.

Additional insight into the changing pattern of sense of place, and campus design over time, is provided by analysis of variance comparing these constructs based on whether students lived in the residence halls or off-campus (not reported in chapter four). The data suggested a significant difference between on-campus and off-campus residents in terms of their assessment of sense of place and campus design, with on-campus residents giving higher scores for sense of place and campus design. It is possible that living on campus helps students feel more connected to campus life and all the opportunities it affords. In a study that explored attachment to place within three spatial ranges (home, neighborhood, and city) and two dimensions (physical and social), Hidalgo and Hernandez (2001) found that attachment to neighborhood was weakest with stronger attachment at home and city scales. They also found that social attachment was greater than physical attachment but both affect person-place bond, and should be considered when measuring attachment to place. By living in the residence halls, which is their new homes, these students may have developed stronger attachment to campus as a reflection of the growing attachment to their new homes.

Studies have shown that first-year residential college students whose parents lived farthest away reported greater homesickness and made more visits home, had a longing for family and friends, and missed their home and hometown. They also tended to adjust by showing

appreciation for their newly made friends at college, making the residence hall room feel more homelike (Tognoli, 2003). Such proximity-maintaining behavior, where individuals who are away from the home to which they are attached long to go back (McAndrew, 1998), and their attempt to recreate such places in their new location (Gans, 1967; Michelson, 1976), are manifestations of sense of place. So, designing residential facilities to facilitate personalization promotes sense of place and a sense of self (Clemons, Banning, & McKelfresh, 2004).

Therefore, it is reasonable to assume that students' greater appreciation for the campus design and enhanced sense of place as freshmen, in this study, had something to do with where they lived in addition to the initial aesthetic factor that drew them to the campus in the first place. In this study, 95 percent of first-year students lived in campus residential halls, as compared to less than 5 percent for each of the other years. Among those who lived off-campus, 39 percent of sophomores, 32 percent of juniors, and 47 percent of seniors lived in apartments within walking distance of campus. This means that a greater percentage of the juniors in this study lived further away from campus than walking distance. This may be one reason why juniors recorded the least sense of place scores of all classifications.

Those who lived on campus were more likely to participate in the social life of campus and take more advantage of all the amenities the campus had to offer. Students who choose to live in off-campus apartments would likely be less connected to campus thereby driving down their level of attachment. This move from campus residence halls to off-campus apartments starts after the first year for most students in this study.

It would be interesting to explore the interaction between undergraduate students' classification and where they lived in terms of their impact of sense of place, campus design and student engagement. Such additional exploration would likely provide greater insight into the

changing pattern of sense of place, campus design and student engagement among student classifications. The limited number of students who lived in the residence halls after their first year limited such additional analysis. There were only seven sophomores, three juniors, and four seniors among respondents in this study who lived on-campus. In general freshmen living in campus residence halls had a higher sense of place than those living off-campus, but there was no difference in sense of place between freshmen who lived in off-campus apartments within walking distance to campus and those who lived farther away. Sophomores who lived within walking distance of campus had a stronger sense of place than those living farther away. But among juniors, those living farther away from campus than walking distance had a stronger sense of place than those living within walking distance. This is hard to explain given that it appears that those who lived closer to campus would have more opportunity to get involved in the social life of the campus and become more attached. While the difference is not significant, the trend calls for further investigation. Perhaps school burnout may be an issue. People might feel sick of going to school the strongest when they are juniors, and that feeling starts to be alleviated when they see the end in sight as seniors. It was also found that for sense of place or strength of attachment to campus was the same for seniors who lived within walking distance of campus and those who lived farther away. A mixed methods study would help to shed light on these contrasting patterns. For residents of fraternity houses, the sample was small in this survey but the pattern is that sophomores and juniors who lived in fraternity houses had stronger sense of place and were more engaged than those living elsewhere. Seniors living in fraternity houses had weaker sense of place than those living elsewhere.

One conclusion that can be reached from all this information is that living on campus is good for first year students. They show stronger sense of place and are more engaged. But



studies have also shown that students who live on-campus, in general, are more engaged than those who live off-campus (Kuh, Gonyea, & Palmer, 2001; Zhao & Kuh, 2004). Given the relationship between sense of place and student engagement, it is reasonable to infer that living on campus strengthens sense of place for all students. It appears that one strategy for enhancing sense of place and student engagement is to encourage as many students as possible to live on campus regardless of their classification. Moreover, it has other benefits such as improved academic performance. In a study at a large state university, De Araujo and Murray (2010) found that living on campus caused an increase of between one-fifth to one full letter grade in students' performance.

### **Research Null Hypothesis Seven**

Research Null Hypothesis Seven states that there was no combination of sense of place, campus design, gender, racial/ethnic identity, and enrollment status (full-time/part-time) that predicts student engagement.

The data suggests that a combination of sense of place, campus design, gender, racial/ethnic identity, and enrollment status (full-time/part-time) predicts, student engagement, with the model predicting more than twenty-five percent of the variance in student engagement. This outcome was expected given the apparent relationship between sense of place and student engagement, as well as the association between campus design and student engagement. The significance of this finding rests in the percentage of variance in student engagement that the model predicted. This is so because the most widely used indicators of student engagement from the National Survey of Student Engagement were not included in this model. Perhaps, combining sense of place and campus design with these widely used NSSE engagement indicators in a

model may offer greater insight into the nature of student engagement and its assessment, especially if such a model incorporates pre-college characteristics.

All the variables contributed in predicting student engagement but sense of place represented the dominant one in this model.

### **Implications of the Findings**

The results of this study have several implications for theory development, research, education and training, practice, and public policy. They should be considered by campus administrators and student affairs staff. Each will be briefly summarized.

#### **Implications for Theory Development**

This study has implications for the development of the theory of sense of place. The result of exploratory factor analysis suggested that under certain conditions, sense of place might be multi-dimensional, but it appears that the scale for assessing sense of place as a uni-dimensional construct may be more reliable. The current state of theory on the dimensionality of sense of place is unclear, with some researchers claiming that it is uni-dimensional, as in the case of Shamai and Ilatove (2005), and others taking a multi-dimensional view like Kyle et al. (2005). This study did not clear up the ambiguity. It is be important to further explore the construct to understand under what conditions it could be stable as a multi-dimensional construct and what those dimensions are. Perhaps sense of place manifests differently in different settings with certain dimensions being more dominant in some circumstances. If this is the case, then under what circumstances would certain dimensions become more dominant?

The finding that sense of place is significantly associated with campus design provides preliminary evidence for claims that campus design is a predictor of sense of place. It has been suggested that the intentional design of campus places can enhance sense of place (Kinzie &

Kuh, 2007). Also, the relationship that was found to exist between sense of place and student engagement begins to fill a gap that exists in the literature and theory by providing preliminary evidence of this relationship. The relationship that was found to exist between student engagement and grades also aligns with existing studies. For instance, Kuh et al. (2008b) examined the relationships between student engagement, college GPA, and persistence for 6,000 students attending 18 baccalaureate-granting institutions; they found that engagement had positive, statistically significant effects on grades and persistence between the first and second year of study for students from different racial and ethnic backgrounds.

The idea that developed from this study that there may be two kinds of sense of place, namely, the *fleeting sense of place* and *enduring sense of place* may have theoretical implications for the process of developing sense of place.

### **Implications for Research**

The relationship between sense of place and student engagement, sense of place and campus design, and campus design and student engagement, present opportunities for further research to validate these findings in other settings. The survey for this study was administered in the spring semester. Varying the timing for the survey administration from spring to fall may help to reach students who may drop out late in their first year.

This study found that generalizability was possible with a response rate of much less than ten percent, given that the sample size was adequate for the chosen statistical tests and that non-response bias testing supported generalizability. It is important to further validate this finding through future research. Non-response bias testing should be done employing multiple methods, whenever possible, to compare results between the various methods: compare respondents to

nonrespondents, use “days to respond” as a regression variable, and compare early to late respondents (Lindner et al., 2001)

Further research to explore the dimensionality of sense of place and how these dimensions are classified will continue to be important in adding clarity in this murky area. Investigating additional domains of sense of place from qualitative studies should provide additional insight into the nature of sense of place and its dimensions.

The strong relationship between campus environment, sense of place, and campus design is worthy of further exploration as a means to more fully integrate the attitudes towards the physical features of a campus to measures of student engagement. Methods of analyses should include confirmatory factor analysis and path analysis. Moreover, studies exploring the relationship between sense of place and student engagement should be replicated at other universities and colleges of various sizes and in different settings to gain insight into the nature of the intervening variables. In addition, it would be interesting to extend this study to online institutions in order to understand the nature of sense of place within a virtual environment as opposed to a physical geographic setting. This idea may sound contradictory since sense of place is rooted in the idea of a physical setting, but perhaps it is not. It is possible that if people form strong bonds because of their online relationships, they may begin to imagine an ideal place that reminds them of such strong bonds. This place would be an imaginary physical setting that exists only in their minds. Or, perhaps further study will show that no such thing as virtual sense of place exists. Future studies should consider mixed methods so that when relationships are uncovered, the follow-up qualitative study would help to explain them.

### **Implications for Practice**

This study reinforces the importance of sense of place as an important factor in student engagement. Effort to enhance student engagement on college campus should then seek to enhance sense of place, which can, in part, be achieved through intentional intervention by means of campus design. Therefore, campus designers should take a more interdisciplinary approach to their work by involving student services staff and others. New approaches to teaching and learning should also drive campus design, not the other way around (Jamieson, 2003). Thus, it will be useful and necessary to integrate research into design of campus places through focus groups and surveys so that research findings will lead to better design, and continuous improvement.

### **Implications for Education and Training**

The curricula for design schools need to be broadened to include topics in student engagement and learning. Similarly, training for student services staff should include exposure to place theory and the value of sense of place in promoting engagement. Education and training in this manner for those who work directly to influence student development should help them take a more holistic approach to their work, and be more effective in providing student-centered services.

### **Implications for Public and Institutional Policy**

This study is instructive for public officials, university administrators, and boards of regents regarding their allocation of resources to include projects intended to enhance sense of place on college and university campuses, such as making a commitment to regular campus master plan updates, and funding for campus civic spaces. Campus space policies should also reflect the need for community space that helps to build social bonds. This may not always fit

within the existing framework of efficiency ratios that many space management offices on university campuses are guided by. A good understanding of how sense of place impacts student engagement, recruitment, retention and persistence will likely influence policies on improving undergraduate education and experience. For instance, the finding that living on campus has a positive impact on sense of place and student engagement may lead institutions to re-examine their on-campus housing policies.

### **Limitations of the Study**

This study was administered in the spring semester, when the least engaged first-year students were probably no longer enrolled. Their absence could have biased the results of the survey. The plan had been to do the survey in the fall, but it was not possible to complete the instrument design and secure IRB approval in time to launch the survey in time.

The internal consistency reliability of two out of the thirteen subscales of the SESOPS instrument might be suspect given that the Cronbach's Alpha computed for both was less than .6 (Cronbach's alpha values were .588 and .570, for Learning Strategies and High Impact Practices, respectively). A Cronbach's alpha value of less than .7 should be used with caution (McMillan & Schumacker, 2001). These two subscales were part of the 2013 NSSE, but no direct comparison could be made because the 2013 version was new.

A minor error in the survey set-up prevented many early respondents from recording their major area of study. The issue was corrected after a respondent sent an e-mail to the researcher reporting the problem. Since more than one hundred respondents were unable to respond to that question, the variable of area of study was excluded from the analyses altogether. A pilot study would have detected this problem before the survey was launched.

Student self-reporting may also be an issue. While some researchers consider self-reporting to be valid under certain conditions (Baird, 1976; Pace, 1985), others have reported concerns using them as proxies for achievement (Pascarella, 2001; Pike, 1996), especially because of its halo effect (Thorndike, 1920). Of particular concern may be the probability of students reporting higher grades than they actually earned. Students self-reported their GPA in this study.

The analyses relied on aggregate data without making distinctions between sub-groups, which may have been different from each other in important ways. This approach may have obscured important insights that could only be gained when each sub-group is explored separately. For instance, first-year students may be different from seniors in terms of the correlation between their GPA and engagement, especially since GPAs for seniors take grades in their previous years into account.

The population for this study was limited to students at one land-grant research university in the Mountain West region. Generalization can be used to provide insight into students at similar institutions, but from the limitations of self-reporting, the results should be generalizable only to the population in this study.

The surprisingly low response rate and difficulty in obtaining a large enough sample made it more difficult to employ more rigorous analytical procedures involving sub-groups for specific tests. The less robust data analysis technique may be seen as a limitation on the quality of evidence used to answer some of the research questions.

### **Recommendations for Future Research**

The results of this study were mixed. A statistically significant association was found regarding the primary emphasis of this study, the relationship between sense of place and student

engagement. However, analyses in this study did not provide greater clarity regarding the dimensions of sense of place and the nature of these dimensions. Additional studies utilizing more data with various student populations at different colleges and universities will help to provide greater insight. These may include community colleges and online institutions. The key question is whether there is a difference in sense of place between these various institutional types and what would account for such differences. The intent is to gain a better understanding of what influences what, and how, by digging into components of the variables being studied.

Future studies should further explore the predictors of student engagement through path analyses. Variables that the literature suggests as related to student engagement should be incorporated into a hypothesized model for the purposes of such path analyses.

There did not appear to be significant difference between respondents and non-respondents regarding socio-demographic characteristics, as well as their attitudes in terms of student engagement, and campus design. However, micro-testing should be done on individual items to verify the findings on non-response bias. In other words, specific items that make up each factor should be investigated more closely. All future studies of this nature should always include non-response bias testing.

The internal consistency reliability indices of two subscales of Student Engagement (Learning Strategies and High Impact Practices) were not good based on the Cronbach's alpha values computed for both scales. Since the current version of the NSSE is new, it is recommended that further analyses be done on these scales to ensure reliability.

Finally, the use of aggregated data in the analyses without differentiating among specific categories may have obscured certain insights that would only be possible when specific groups or categories are examined specifically in detail, such as looking at first-year students versus



Seniors. Future studies on this topic should investigate specific sub-groups to find out what differences might exist between sub-groups and whether significant associations found in this study would be equally true for all groups in the study.

### **Conclusion**

This study provides preliminary empirical evidence that sense of place is strongly related to student engagement among undergraduate students at a major public research university. No study providing such evidence was found in the literature; therefore it contributes to closing this gap. It also points to relationships between campus design and sense of place, as well as campus design and student engagement. The study also confirms previous findings in the literature that student engagement is associated with grades, but reveals no significant associations between sense of place and grades, nor between campus design and grades. Hence, any impact that sense of place and campus design may have on grades would be indirect to the extent that they are significantly associated with student engagement, which, in turn, has influence on grade point average.

Exploratory factor analysis showed that the eleven scales of the NSSE instrument aligned as expected, with few minor exceptions. The items that assess campus design also loaded perfectly under one factor. The analysis did not, however, provide clarification regarding the dimensionality of sense of place or the nature of these dimensions.

Student engagement is very important to student learning and development, and any new knowledge that enhances understanding of engagement helps colleges and universities do a better job of meeting students' needs. The realization that the intentional design of a college campus has impact on engagement may provide campus leadership, student services staff, and campus designers with empirical evidence to make a stronger case for better designed and

maintained campus facilities. The study may also influence the way those who design or provide services for students are trained and educated. Further research may be sparked by these finding.

The finding that sense of place varies with undergraduate students' classification as well as the suggestion that there may be two kinds of sense of place, namely, fleeting sense of place and enduring sense of place, may have significant implication for theory development.

## Epilogue

Epilogues to dissertations are infrequent, but due to my role as a campus architect, my committee suggested that I provide a short discussion of “what does all this research mean to a practicing architect?” in an epilogue. The finding in this study that sense of place is significantly related to student engagement may have practical implications for practicing campus architects. Among the many duties of a campus architect, which may include managing campus capital building program, ensuring good design on campus is paramount. The Roman architect Vitruvius suggested that a well-designed building should exhibit three major qualities:

- Commodity: buildings should work well for the purpose they are designed.
- Firmness: buildings should be built well and durable.
- Delight: buildings should be aesthetically pleasing or beautiful

These qualities remain important considerations in designing buildings today, but how do they apply to campus design? Unlike an individual building, a campus is a collection of buildings and grounds tied together by an overarching purpose, which is the institutional mission. In general terms, higher educational institutions have primary missions of: teaching and learning, research, and public service or outreach. At the core of this mission are the students. Without students, there would be no faculty; without faculty there would be no research, and certainly no staff. And public service is only possible when the beneficence of the university, based on learning and research, flows to the community and general public. Therefore, successful campus design should always emphasize the creation of campus places that support the mission, rather than focus on the design of individual buildings, spaces, and landscapes for their own sakes. A campus space is only transformed into a campus place when it is imbued with meaning through use and experience by students, faculty, staff, and visitors.

Considering the importance and cost of most campus projects, an investment in early research to learn what all, not just some, users think will go a long way in helping the campus architect to understand the uniqueness of such projects. Such research may also involve literature review and benchmarking studies. Gathering information about places that work on campus and places that do not work, and probing why some places are successful while others are not, will help the campus architect develop guidelines for campus design.

Surveys conducted by The University of Wisconsin – Madison Facilities Division over several years, asked campus community members to identify their favorite and least favorites places on campus, and why. The images that follow show some of the places that people on campus identified in each category. The pictures alone show striking differences.



School of Education  
Memorial Union Terrace  
Library Mall  
Lakeshore Path  
Allen Centennial Gardens

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FAVORITE PLACES



Bascom Hill



Engineering Research Building  
McArdle Building  
Union South

#### LEAST FAVORITE PLACES



Intersection of University Avenue & Salbeck Drive

Favorite places may be indoor or outdoor. Such places, according to students, are easily accessible, allow flexibility of use or are easily re-configurable, provide emotional warmth and thermal comfort. They also have amenities such as comfortable seating and wireless access. They should have 24-hour access whenever possible, and combine social and school life. These places are aesthetically pleasing. The least favorite places lack most of these; they are sometimes out-of-the-way and not welcoming. These places often lacked aesthetically pleasing appearance, and did not always function well for their purpose.

While the studies that yielded these results were not rigorous, the responses are consistent with what students have identified as important to them in subsequent unpublished sense of place studies at UW-Madison. Among the top five favorite places were the two Union buildings and some outdoor campus spaces. In the open-ended section of the current study, the vast majority of respondents cited outdoor spaces, especially the Oval as the most distinctive feature

of the CSU campus. These were all places that allowed students to interact and form meaningful social bonds with their peers, to do “social studying”, to meet with faculty in less formal settings, or simply have quiet spaces for reflection. Students need places that are accessible to them. Lack of such campus places could lead to a sense of alienation.

As a follow-up to the sense of place survey, focus groups were conducted. The results of the focus groups aligned with the observations already made from the surveys. Their favorite places were also the ones to which they were most attached. The reasons for their attachment to these places included: variety of spaces for engaging in different kinds of activities; spaces and environment that foster social interaction; emotional connection based on vibe, ambience, visual appearance, reminder of home or homey atmosphere and other such factors; use or function; proximity, convenience and accessibility; and general considerations such as memories and good food. When asked why they would take their visitors to certain places on campus, most cited the beauty of the place. Other reasons included views, social environment, historic legacy, food, place to relax, and iconic nature of the place.

Another insight from these sense of place studies came from comparing responses from students and campus design professionals. In describing what sense of place meant to them, both groups used words and phrases that describe place identity, and place-based affect. But only students used the additional words and phrases such as function, ease of use, availability, and resources. These additional words and phrases describe the ability of a place to afford individuals the opportunity to do the things they want to do; this is place dependence.

These studies on sense of place, present lessons that may be beneficial to campus architects and designers in general. First, the strong relationship between sense of place and student engagement can help campus architects to make a strong case for good campus design as

a means of enhancing sense of place. The need to involve students in conversations about the design of great campus places is highlighted by the suggestion that what design professionals want are not always aligned with what students need and want. Third, the need for research and continuous feedback as tools for designing great places cannot be overemphasized. Fourth, the pattern of changing sense of place over a student's college career suggests the need for greater effort on the part of campus architects to engage students in order to understand how best to enhance their sense of place with respect to their campuses. From the open-ended questions in this study directed to CSU students and the sense of place study at UW-Madison, one thing that posed a major concern for many students was the increased level of construction activities on campus. They claim that campus construction compromised their enjoyment of campus. This may be a contributing factor to declining sense of place between first year and junior year.

Therefore, campus architects and those charged with campus planning on college and university campuses should consider developing a comprehensive communication plan for major construction projects on campus to inform the campus community of impending projects, and discuss their implications and benefits. If students and campus community members are well-informed about upcoming construction projects, impending disruptions and road or side walk closures before they happen, and what all the work means for the university and campus community, their negative attitudes towards campus construction would likely be mitigated. Images or renderings of these campus places should be used in advertising campaigns, town hall meetings, and social media briefings. The intent would be to help people see beyond the disruptions and give them something to hope for. A successful campaign may help to arrest the decline in sense of place. Of course, it is always important to shorten construction timelines in

order to minimize disruptions. Based on these studies and my personal experiences as a campus architect, I suggest that great campus places can be achieved by a well-thought out process.

First, one approach is to view the campus, if it is large, as a complex composition consisting of neighborhoods. Otherwise, the entire campus may be treated as a neighborhood. Each neighborhood, in turn, is a composition made of other compositions such as buildings, open spaces, and other site features. Therefore, the construct is a complex nested arrangement of compositions within compositions, from the large scale down to the smallest perceivable details. So the campus becomes a layered tapestry of spaces, buildings, road networks, and other site features that need to be resolved. Understanding how students interact and function within these complex layers is a necessary first step to a successful student-centered design.

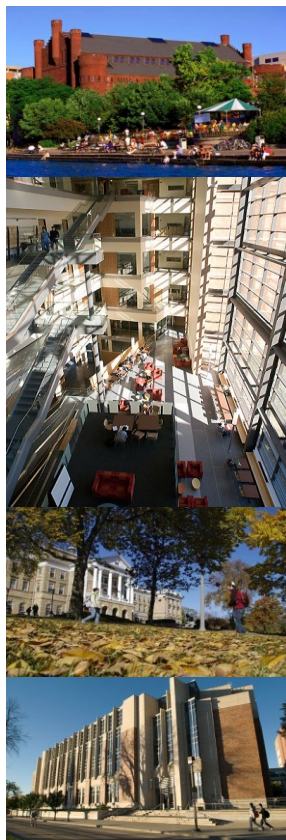
Second, buildings and campus places must be designed to function well and adequately meet the needs of users. They must be sustainable and sublime at the same time. In addition, they should incorporate “draws” to pull people into them and create an environment that is conducive to intellectual and social exchange. Whereas it is not too difficult to come up with standards and checklists that could guide conversations on campus regarding what is considered sustainable and functional, it can be tricky to arrive at a consensus regarding what is beautiful and inviting.

Third, any winning strategy to develop the kinds of campus places that students really want, should start by engaging students. Students and the campus community should provide input to designers in order to determine how the spaces can best meet their needs. Coomes and DeBard (2004) state that there are four distinct generations on college campuses: the silents (born between 1925 and 1942), boomers (born between 1943 and 1960), Gen-Xers (born between 1961 and 1981), and millenials (born between 1982 and 2002) (Coomes & DeBard, 2004). If one or two of these groups are making all the design decisions for everyone else, they



are likely to overlook important considerations that may not be important to their own generation.

The rubric that follows represents a framework around which conversations with all stakeholders could be organized. This recognizes that great campus places should be functional or fit the purpose they are intended to serve, sustainable, and aesthetically pleasing. However, what is visually and emotionally appealing can only be arrived at through well structured dialogue that addresses essential qualities of design aesthetics as they apply to key components of the physical campus environment.



Memorial Union Terrace  
Microbial Sciences  
Bascom Hill  
Biochemistry

#### PLEASING COMPOSITION

Functional and sustainable campus places are easily evaluated due to:

- Standards
- Measurable factors

Aesthetic appropriateness can be assessed by:

- Richness
- Balance
- Unity

As applied to three components of campus places:

- Open Spaces
- Building Exteriors
- Primary Interior Spaces

SUSTAINABLE				
AESTHETICS				
	OPEN SPACE	BUILDING EXTERIOR	PRIMARY INTERIOR SPACE	COMPONENTS
RICHNESS	■	■	■	
BALANCE	■	■	■	
UNITY	■	■	■	
QUALITY				
FUNCTIONAL				

The rubric is designed to emphasize that campus places must be sustainable and function well, physically and emotionally. Established standards alone cannot be the sole basis for judging the functionality of a campus place. Benchmarking, and physical assessment of similar

places through site visits is another way to judge how a place functions emotionally and psychologically.

It is equally important that the campuses are sustainable. This means that there is a general attitude and a sense of stewardship in the management of all kinds of resources on campus. This should lead to savings in resources, reduction in carbon footprint and healthier environments for students, faculty, staff and campus visitors. This sense of stewardship should be infused into all aspects of campus life, including the curriculum, so that all members of the campus learning community can learn from one another.

In reviewing the natural and built forms that attract people, certain qualities emerge: these are richness, balance and unity. Richness is exhibited by places on campuses that employ a diversity of compositional elements such as details, colors, and a variety of patterns, textures and materials to imbue the place with visual vitality. A pleasing composition is also one that exhibits unity because it is perceived as a whole. It also demands scaling coherence such that there is a perception of an inherent natural scaling factor that pervades the composition and relates it to the human scale. Arranging tables and chairs in small groups where students can work closely in more intimate settings enhances interaction. Corridors that are designed with recessed areas and seating areas increase the likelihood of chance encounters among students and between students and faculty. Breaking down a large space into smaller or several varying sizes of space help to make such places more psychologically comfortable for users. But, there needs to be a balance between this diversity that engenders richness and vibrancy on the one hand, and unity that conveys a sense of coherence on the other.

The rubric also shows that conversations about aesthetic appropriateness should focus on addressing these three qualities as they apply to campus open spaces and landscapes, building

exteriors, and the primary interior gathering spaces and how they overlay the patterns of movements across campus or specific neighborhoods in which they are located. For instance, a discussion on the appropriate design of an interior gathering space could revolve around questions such as these: How is it intended to be used? Can it be configured in order to serve multiple needs at the same time? Could it accommodate quiet study, small group discussions, food, wireless, and casual lounging functions all at the same time? Does it have comfortable seating and have homelike qualities? Is it located in such a way that it can serve as a node along vibrant paths across campus? What kinds of other “draws” does it have? Are students and other end-users involved in this design effort? What is important to them?

What follows is a description of a project for the School of Education at the University of Wisconsin-Madison that attempted to create a campus place where students and the campus community at large want to be. The scope of this \$33.5 project was to renovate more than 70,000 square feet of an existing historic structure and a new addition of nearly 40,000 square feet in the historic core of the campus. The project was also a LEED platinum and energy star building.

The project team included faculty, staff, administrators, state representative and consultants but no students. The early design proposal centered on functions that served the faculty whose offices are located in the building as well the preferences of the architect of record. This plan was configured in the form of a donut, with an atrium in the center and faculty offices on the perimeter. Such a plan would have created a poorly proportioned atrium buried in the interior without natural lighting. There are certain proportions that make people feel comfortable; the proportions of the proposed atrium would make it feel like a tall narrow shaft. The plan also called for repaving an existing surface parking lot that is located between the building and a wooded area that extends to the lake. The University Architect’s office became

the strong advocates for using the campus master plan principles and what was beneficial to the campus at large and students in particular. The existing conditions are shown in photographs that follow.



Old School of Education

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#### SCHOOL OF EDUCATION



Through extensive dialogues and negotiations, the team agreed to a scheme that balanced the functional needs of staff and faculty with the need for a student-centered environment. The atrium was then pulled out to give a better view to the lake and plenty of day lighting from the north. It was re-designed as a nice living room, with warmth, comfortable seating, fire place, and touches of the home. It is also located to take advantage of patterns of movement across the site. Parking was buried underground, with its roof deck serving as green roof plaza with seating for students' use.

The relocation of parking also resolved nagging issue of vehicular-pedestrian conflict given that there is heavy foot traffic across the site. There are spaces in front of the large lecture

hall that are furnished with comfortable seating, with nooks added throughout the building to encourage chance encounters and gathering spaces for small groups. By engaging in serious conversations about what students want, the team arrived at a design solution that has been embraced by all. The image below shows what the place looks like today.



The solution paid attention to function, and was designed to be sustainable. But, it also sought to create a design that is inviting and a place that students want to be. It focused its aesthetic attention on the exterior architecture, the open space and landscape around the building as well as the primary interior spaces. This campus place is equipped with wireless internet, and close to Muir woods with a view to Lake Mendota. The open space is furnished with tables and chairs, and planted with shade trees; this is now an outdoor room where faculty, staff and students can congregate informally between classes or at other times. In nice weather people have their lunch outdoors in this plaza deck (over the parking garage) with spectacular views of the lake. The space has also been programmed for outdoor events. Another popular spot in nice weather is the green roof on the third floor overlooking the lake.

Students and the campus community at-large can experience the campus through their interactions with the exterior of buildings, the open spaces and landscapes or outdoor rooms that these buildings help to define, and the primary interior spaces within buildings. However, their experience of place is enhanced through the social interaction that these designs facilitate.

Buildings and campus places must function well and adequately meet the needs of users. Facilities must be designed to be sustainable so that present needs can be met without compromising the ability of future generations to meet theirs. It is equally important that the physical learning environment of college campuses be pleasing. Therefore they must exhibit richness, unity and balance. After all, its embrace of diversity in all its forms enriches the academy, intellectually and socially, but it is unified by a common purpose that is centered on its mission. It thrives when it achieves a harmonious balance between unity and diversity. The physical campus should reflect this ideal, so that it not only supports learning but encourages all within the academic community to learn from it.

In the end, the way that the campus community and visitors experience the campus is important. They must see it as sublime and functional at the same time. It must also be sustainable and make them feel comfortable. The designers' role is to help create appropriate stage sets for the plays that take place every day within the campus community. These plays or patterns of events and activities, infuse the campus with energy; therefore, buildings and campus places should incorporate “draws” that support and enhance these patterns. Ultimately, the campus should be a place where people want to be rather than just a place they have to be.

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## Appendix A: NSSE Sample Instrument

*This is a facsimile of U.S. English version of the online NSSE instrument as it appears to the student.*

*A paper-formatted facsimile of the survey which includes item numbering is available on the*

*NSSE Web site: [nsse.iub.edu/html/survey\\_instruments.cfm](http://nsse.iub.edu/html/survey_instruments.cfm)*



0% complete

During the current school year, about how often have you done the following?

	Very often	Often	Sometimes	Never
Asked questions or contributed to course discussions in other ways	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Prepared two or more drafts of a paper or assignment before turning it in	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Come to class without completing readings or assignments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Attended an art exhibit, play or other arts performance (dance, music, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Asked another student to help you understand course material	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Explained course material to one or more students	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Prepared for exams by discussing or working through course material with other students	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Worked with other students on course projects or assignments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gave a course presentation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

During the current school year, about how often have you done the following?

	Very often	Often	Sometimes	Never
Combined ideas from different courses when completing assignments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Connected your learning to societal problems or issues	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Included diverse perspectives (political, religious, racial/ethnic, gender, etc.) in course discussions or assignments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Examined the strengths and weaknesses of your own views on a topic or issue	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tried to better understand someone else's views by imagining how an issue looks from his or her perspective	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Learned something that changed the way you understand an issue or concept	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Connected ideas from your courses to your prior experiences and knowledge	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

During the current school year, about how often have you done the following?

	Very often	Often	Sometimes	Never
Talked about career plans with a faculty member	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Worked with a faculty member on activities other than coursework (committees, student groups, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discussed course topics, ideas, or concepts with a faculty member outside of class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discussed your academic performance with a faculty member	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

During the current school year, how much has your coursework emphasized the following?

	Very much	Quite a bit	Some	Very little
Memorizing course material	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Applying facts, theories, or methods to practical problems or new situations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Analyzing an idea, experience, or line of reasoning in depth by examining its parts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Evaluating a point of view, decision, or information source	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Forming a new idea or understanding from various pieces of information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

During the current school year, to what extent have your instructors done the following?

	Very much	Quite a bit	Some	Very little
Clearly explained course goals and requirements	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Taught course sessions in an organized way	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Used examples or illustrations to explain difficult points	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Provided feedback on a draft or work in progress	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Provided prompt and detailed feedback on tests or completed assignments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

During the current school year, about how often have you done the following?

	Very often	Often	Sometimes	Never
Reached conclusions based on your own analysis of numerical information (numbers, graphs, statistics, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Used numerical information to examine a real-world problem or issue (unemployment, climate change, public health, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Evaluated what others have concluded from numerical information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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20% complete

During the current school year, about how many papers, reports, or other writing tasks of the following length have you been assigned? (Include those not yet completed.)

	None	1-2	3-5	6-10	11-15	16-20	More than 20 papers, etc.
Up to 5 pages	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Between 6 and 10 pages	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11 pages or more	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

During the current school year, about how often have you had discussions with people from the following groups?

	Very often	Often	Sometimes	Never
People of a race or ethnicity other than your own	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People from an economic background other than your own	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People with religious beliefs other than your own	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People with political views other than your own	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

During the current school year, about how often have you done the following?

	Very often	Often	Sometimes	Never
Identified key information from reading assignments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reviewed your notes after class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Summarized what you learned in class or from course materials	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

During the current school year, to what extent have your courses challenged you to do your best work?

Not at all ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 Very much

Which of the following have you done or do you plan to do before you graduate?

	Done or in progress	Plan to do	Do not plan to do	Have not decided
Participate in an internship, co-op, field experience, student teaching, or clinical placement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hold a formal leadership role in a student organization or group	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Participate in a learning community or some other formal program where groups of students take two or more classes together	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Participate in a study abroad program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Work with a faculty member on a research project	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Complete a culminating senior experience (capstone course, senior project or thesis, comprehensive exam, portfolio, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

About how many of your courses at this institution have included a community-based project (service-learning)?

- ☐ All  
☐ Most  
☐ Some  
☐ None

Indicate the quality of your interactions with the following people at your institution.

	Poor 1	2	3	4	5	6	Excellent 7	Not Applicable
Students	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Academic advisors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Faculty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Student services staff (career services, student activities, housing, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other administrative staff and offices (registrar, financial aid, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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How much does your institution emphasize the following?

	Very much	Quite a bit	Some	Very little
Spending significant amounts of time studying and on academic work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Providing support to help students succeed academically	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Using learning support services (tutoring services, writing center, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Encouraging contact among students from different backgrounds (social, racial/ethnic, religious, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Providing opportunities to be involved socially	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Providing support for your overall well-being (recreation, health care, counseling, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Helping you manage your non-academic responsibilities (work, family, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Attending campus activities and events (performing arts, athletic events, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Attending events that address important social, economic, or political issues	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

About how many hours do you spend in a typical 7-day week doing the following?

	Hours per week							
	0	1-5	6-10	11-15	16-20	21-25	26-30	More than 30
Preparing for class (studying, reading, writing, doing homework or lab work, analyzing data, rehearsing, and other academic activities)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Participating in co-curricular activities (organizations, campus publications, student government, fraternity or sorority, intercollegiate or intramural sports, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Working for pay <b>on campus</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Working for pay <b>off campus</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Doing community service or volunteer work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Relaxing and socializing (time with friends, video games, TV or videos, keeping up with friends online, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Providing care for dependents (children, parents, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Commuting to campus (driving, walking, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Of the time you spend preparing for class in a typical 7-day week, about how many hours are on *assigned reading*?

- ☐ 0 hours
- ☐ 1-5 hours
- ☐ 6-10 hours
- ☐ 11-15 hours
- ☐ 16-20 hours
- ☐ 21-25 hours
- ☐ 26-30 hours
- ☐ More than 30 hours

How much has your experience at this institution contributed to your knowledge, skills, and personal development in the following areas?

	Very much	Quite a bit	Some	Very little
Writing clearly and effectively	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Speaking clearly and effectively	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Thinking critically and analytically	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Analyzing numerical and statistical information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Acquiring job- or work-related knowledge and skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Working effectively with others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Developing or clarifying a personal code of values and ethics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Understanding people of other backgrounds (economic, racial/ethnic, political, religious, nationality, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Solving complex real-world problems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Being an informed and active citizen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How would you evaluate your entire educational experience at this institution?

- ☐ Excellent
- ☐ Good
- ☐ Fair
- ☐ Poor

If you could start over again, would you go to the *same institution* you are now attending?

- ☐ Definitely yes
- ☐ Probably yes
- ☐ Probably no
- ☐ Definitely no

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Screen 3 of 4 (continued)

Why do we ask about your personal background?

70% complete

What is your class level?

- ☐ Freshman/first-year
- ☐ Sophomore
- ☐ Junior
- ☐ Senior
- ☐ Unclassified

Thinking about this current academic term, are you a full-time student?

- ☐ Yes
- ☐ No

How many courses are you taking for credit this current academic term?

- ☐ 0
- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ 7 or more

Of these, how many are *entirely online*?

- ☐ 0
- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ 7 or more

How many majors do you plan to complete? (Do not count minors.)

- ☐ One
- ☐ More than one

What have most of your grades been up to now at this institution?

- ☐ A
- ☐ A-
- ☐ B+
- ☐ B
- ☐ B-
- ☐ C+
- ☐ C
- ☐ C- or lower

Did you begin college at this institution or elsewhere?

- ☐ Started here
- ☐ Started elsewhere

Since graduating from high school, which of the following types of schools have you attended *other than* the one you are now attending? (Select all that apply.)

- ☐ Vocational or technical school
- ☐ Community or junior college
- ☐ 4-year college or university other than this one
- ☐ None
- ☐ Other

What is the highest level of education you ever expect to complete?

- ☐ Some college but less than a bachelor's degree
- ☐ Bachelor's degree (B.A., B.S., etc.)
- ☐ Master's degree (M.A., M.S., etc.)
- ☐ Doctoral or professional degree (Ph.D., J.D., M.D., etc.)

**What is the highest level of education completed by either of your parents (or those who raised you)?**

- ☐ Did not finish high school
- ☐ High school diploma or G.E.D.
- ☐ Attended college but did not complete degree
- ☐ Associate's degree (A.A., A.S., etc.)
- ☐ Bachelor's degree (B.A., B.S., etc.)
- ☐ Master's degree (M.A., M.S., etc.)
- ☐ Doctoral or professional degree (Ph.D., J.D., M.D., etc.)

**What is your gender?**

- ☐ Male
- ☐ Female

**Enter your year of birth (e.g., 1994):**

**Are you an international student or foreign national?**

- ☐ Yes
- ☐ No

**What is your racial or ethnic identification? (Select all that apply.)**

- ☐ American Indian or Alaska Native
- ☐ Asian
- ☐ Black or African American
- ☐ Hispanic or Latino
- ☐ Native Hawaiian or Other Pacific Islander
- ☐ White
- ☐ Other
- ☐ I prefer not to respond

**Are you a member of a social fraternity or sorority?**

- ☐ Yes
- ☐ No

Which of the following best describes where you are living while attending college?

- ☐ Dormitory or other campus housing (not fraternity or sorority house)
- ☒ Fraternity or sorority house
- ☐ Residence (house, apartment, etc.) *within* walking distance to the institution
- ☐ Residence (house, apartment, etc.) *farther than* walking distance to the institution
- ☐ None of the above

Are you a student-athlete on a team sponsored by your institution's athletics department?

- ☐ Yes
- ☐ No

Are you a current or former member of the U.S. Armed Forces, Reserves, or National Guard?

- ☐ Yes
- ☐ No

Have you been diagnosed with any disability or impairment?

- ☐ Yes
- ☐ No
- ☐ I prefer not to respond

Which of the following have been diagnosed? (Select all that apply)

- ☐ A sensory impairment (vision or hearing)
- ☐ A mobility impairment
- ☐ A learning disability (e.g., ADHD, dyslexia)
- ☐ A mental health disorder
- ☐ A disability or impairment not listed above

Which of the following best describes your sexual orientation?

- ☐ Heterosexual
- ☐ Gay
- ☐ Lesbian
- ☐ Bisexual
- ☐ Questioning or unsure
- ☐ I prefer not to respond

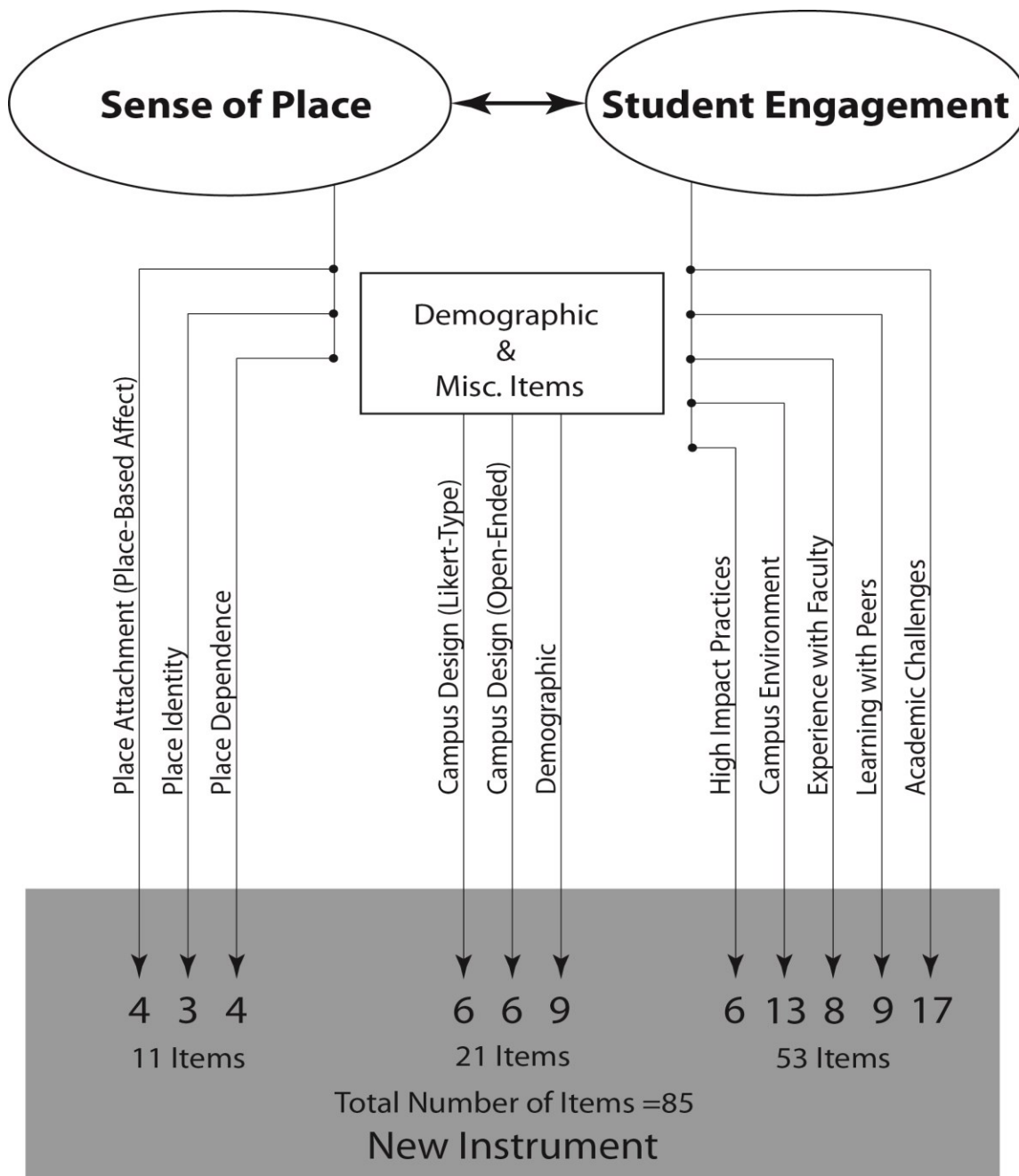
Continue

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Screen 4 of 4 (continued)



## Appendix B: New Instrument Structure



## Appendix C: Items Comprising the NSSE Engagement Indicators

### ACADEMIC CHALLENGE

#### Higher Order Learning

During the current school year, how much has your coursework emphasized the following? Response options: Very little, Some, Quite a bit, Very much

- a. Applying facts, theories, or methods to practical problems or new situations (**acholapply**)
- b. Analyzing an idea, experience, or line of reasoning in depth by examining its basic parts (**acholanalyze**)
- c. Evaluating a point of view, decision, or information source (**acholevaluate**)
- d. Forming a new idea or understanding from various pieces of information (**acholsynthesiz**)

#### Reflective & Integrative Learning

In your experiences at your institution during the current school year, about how often have you done each of the following? Response options: Never, Sometimes, Often, Very Often

- a. Connected your learning to societal problems or issues (**acrila**)
- b. Combined ideas from different courses when completing assignments (**acrilb**)
- c. Included diverse perspectives (political, religious, racial/ethnic, gender, etc.) in course discussions or assignments (**acrile**)
- d. Examined the strengths and weaknesses of your own views on a topic or issue (**acrild**)
- e. Tried to better understand someone else's views by imagining how an issue looks from his or her perspective (**acrile**)
- f. Learned something that changed the way you understand an issue or concept (**acrilf**)
- g. Connected ideas from your courses to your prior experiences and knowledge (**acrilg**)

#### Learning Strategies

In your experiences at your institution during the current school year, about how often have you done each of the following? Response options: Never, Sometimes, Often, Very Often

- a. Identified key information from reading assignments (**aclsa**)
- b. Reviewed your notes after class (**aclsb**)
- c. Summarized what you learned in class or from course materials (**aclsc**)

#### Quantitative Reasoning

In your experiences at your institution during the current school year, about how often have you done each of the following? Response options: Never, Sometimes, Often, Very Often

- a. Reached conclusions based on your own analysis of numerical information (numbers, graphs, statistics, etc.) (**acqra**)
- b. Used numerical information to examine a real-world problem or issue (unemployment, climate change, disease prevention, etc.) (**acqrb**)
- c. Evaluated what others have concluded from numerical information (**acqrc**)

## **LEARNING WITH PEERS**

### **Diverse Interactions**

About how often have you had serious conversations with people who differ from you in the following ways? Response options: Never, Sometimes, Often, Very Often

- a. Political views (**lwpdia**)
- b. Economic and social background (**lwpdib**)
- c. Religious beliefs or philosophy of life (**lwpdic**)
- d. Race, ethnic background, or country of origin (**lwpdid**)
- e. Sexual orientation (**lwpdise**)

### **Collaborative Learning**

In your experiences at your institution during the current school year, about how often have you done each of the following? Response options: Never, Sometimes, Often, Very Often

- a. Asked another student to help you understand course material (**lwpcla**)
- b. Explained course material to one or more students (**lwpclb**)
- c. Prepared for exams by discussing or working through course material with other students (**lwpclc**)
- d. Worked with other students on course projects or assignments (**lwpclld**)

## **EXPERIENCES WITH FACULTY**

### **Student Faculty Interaction**

In your experiences at your institution during the current school year, about how often have you done each of the following? Response options: Never, Sometimes, Often, Very Often

- a. Talked about career plans with a faculty member (**ewfsfia**)
- b. Worked with a faculty member on activities other than coursework (committees, student groups, etc.) (**ewfsfib**)
- c. Discussed course topics, ideas, or concepts with a faculty member outside of class (**ewfsfic**)
- d. Discussed your academic performance with a faculty member (**ewfsfid**)

### **Good Teaching Practices**

During the current school year, in about how many of your courses have your instructors done the following? Response options: None, Some, Most, All

- a. Clearly explained course goals and requirements (**ewfgtpa**)
- b. Taught course sessions in an organized way (**ewfgtpb**)
- c. Used examples or illustrations to explain difficult points (**ewfgtpc**)
- d. Gave prompt feedback on tests or assignments (**ewfgtpd**)

## **CAMPUS ENVIRONMENT**

### **Quality of Interactions**

Indicate the quality of your interactions with the following people at your institution: Response options: Poor (1) to Very good (4), Not Applicable

- a. Students (**ceqoia**)
- b. Academic advisors (**ceqoib**)
- c. Faculty (**ceqoic**)
- d. Student services staff (campus activities, housing, career services, etc.) (**ceqoid**)
- e. Other administrative staff and offices (registrar, financial aid, etc.) (**ceqoie**)

### **Supportive Environment**

How much does your institution emphasize each of the following?

Response options: Very little, Some, Quite a bit, Very much

- a. Providing the support you need to help you succeed academically (**cesea**)
- b. Using learning support services (writing center, tutoring services, etc.) (**ceseb**)
- c. Having contact among students from different backgrounds (social, racial/ethnic, religious, etc.) (**cesec**)
- d. Providing opportunities to be involved socially (**cesed**)
- e. Providing support for your overall well-being (recreation, health care, counseling, etc.) (**cesee**)
- f. Helping you manage your non-academic responsibilities (work, family, etc.) (**cesef**)
- g. Attending campus events and activities (special speakers, cultural performances, athletic events, etc.) (**ceseg**)
- h. Attending events that address important social, economic, or political issues (**ceseh**)

## **HIGH-IMPACT PRACTICES**

Which of the following have you done or do you plan to do before you graduate? Response options: Done or in progress, Plan to do, Do not plan to do, Have not decided

- a. Participate in an internship, co-op, field experience, student teaching, or clinical placement (**hipa**)
- b. Hold a formal leadership role in a student organization or group (**hipb**)
- c. Participate in a learning community or some other formal program where groups of students take two or more classes together (**hipc**)
- d. Participate in a study abroad program (**hipd**)
- e. Work with a faculty member on a research project (**hipe**)
- f. Complete a culminating senior experience (capstone, senior project or thesis, comprehensive exam, portfolio, etc) (**hipf**)

## **Appendix D: Items Comprising the Sense of Place Scale**

### **SENSE OF PLACE**

#### **Place Attachment (Place-based Affect)**

Place attachment refers to the bond that develops between an individual or group and a particular spatial setting such as a neighborhood or geographic region. Response options for these 4-point Likert scale items are: Strongly agree, Agree, Disagree, Strongly disagree

- a. I feel relaxed when I'm on the CSU campus (**attach1**)
- b. I am happy when I am on the CSU campus (**attach2**)
- c. The CSU campus is one of my favorite places to be (**attach3**)
- d. I really miss the CSU campus when I'm away from it for a long time (**attach4**)

#### **Place Identity**

Place identity is described as the "dimensions of self that define the individual's personal identity in relation to the physical environment by means of a complex pattern of conscious and unconscious ideas, beliefs, preferences, feelings, values, goals and behavioral tendencies and skills relevant to this environment" (Jorgensen Stedman, 2001, p. 234; Proshanky, 1978, p. 155). For the following 4-point Likert items, response options are: Strongly agree, Agree, Disagree, Strongly disagree

- a. The CSU campus is reflection of me (**identit1**)
- b. This campus says very little about whom I am (**identit2**)
- c. I can really be myself on the CSU campus (**identit3**)
- d. This campus reflects the type of person I am (**identit4**)

#### **Place Dependence**

Place dependence refers to the suitability of a setting for seeking satisfaction in the pursuit of some personalized interest or goal. Response options for these 4-point Likert items are: Strongly agree, Agree, Disagree, Strongly disagree

- a. This campus provides many of the opportunities to engage in my favorite activities (**depend1**)
- b. This campus is a good place for doing the things I enjoy the most (**depend2**)
- c. This campus is not a good place to do the things I most like to do (**depend3**)
- d. As far as I am concerned, there is no better place to be than on the CSU campus (**depend4**)

## Appendix E: Demographic and Miscellaneous Items

### DEMOGRAPHIC AND MISCELLANEOUS

#### Miscellaneous Campus Design (Likert items)

Indicate your level of agreement/disagreement with the following statements.

Response options for these 4-point Likert scale items are: Strongly agree, Agree, Disagree, Strongly disagree

- a. Overall, the CSU campus is well-designed (in terms of the landscape design as well as the placement, size and relationships of buildings and other physical features within the landscape) (**campdes1**)
- b. The CSU campus is beautiful (**campdes2**)
- c. The CSU campus has mostly great architecture (**campdes3**)
- d. The CSU has great landscape and outdoor spaces (**campdes4**)
- e. Most of the buildings on the CSU campus serve their purpose well (**campdes5**)
- f. There are many great interior public spaces on the CSU campus (**campdes6**)

#### Miscellaneous Campus Design (Open-ended Questions)

- a. What do you like best about the CSU Campus? Why?
- b. What are your favorite physical features of the CSU campus and surrounding area - special places that are meaningful to you? Why?
- c. What issues do you feel will most affect the CSU campus in the next five years - internal and external?
- d. In your opinion, what physical features of the CSU campus and surrounding area should be enhanced or changed?
- e. What is currently missing from your long-term vision of the CSU and surrounding area?
- f. At the end of the next five years, what would you like the CSU and surrounding area.

#### Demographic Items

Indicate your level of agreement/disagreement with the following statements.

Response options for these 4-point Likert scale items are: Strongly agree, Agree, Disagree, Strongly disagree

- a. Major or intended major (**major**)
- b. Grade (**grades**)
- c. Gender (**gender**)
- d. Age (**age**)
- e. International student status (**internat**)
- f. Living arrangement (**livenow**)
- g. Race/ethnicity (**ethnicit**)
- h. Classification (**class**)
- i. Full/Part-time status (**enrlment**) (Kuh, 2009b)

## Appendix F: New Student Engagement and Sense of Place (SESOPS) Instrument

Qualtrics Survey Software

Page 1 of 12

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### STUDENT ENGAGEMENT AND SENSE OF PLACE SURVEY (SESOPS)

We are trying to learn how the emotional bonding that existing between students and their campus (described as sense of place) relates to student engagement. There are no right or wrong answers to these questions. All responses will be anonymous and participation is voluntary. The results of this study may provide campus planners, university administration, and student services professionals better insight in planning student-centered campuses of the future. This survey takes 10-15 minutes to complete. We greatly appreciate your feedback.

#### Block 3

#### Block 2

.

1. Please select your level of agreement with the following statements.

	Strongly Disagree	Disagree	Agree	Strongly Agree
I feel relaxed when I'm on the CSU campus	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The CSU campus is a reflection of me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This campus provides many of the opportunities to engage in my favorite activities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This campus says very little about who I am	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I am happy when I am on the CSU campus	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The CSU campus is one my favorite places to be	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can really be myself on the CSU campus	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This campus is not a good place to do the things I most like to do	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This campus reflects the type of person I am	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
As far as I am concerned, there is no better place to be than on the CSU campus	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I really miss the CSU campus when I'm away from it for a long time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2. During the current school year, how much has your coursework emphasized the following?

	Very Little	Some	Quite a Bit	Very Much
Applying facts, theories, or methods to practical problems or new situations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Analyzing an idea, experience, or line of reasoning in depth by examining its basic parts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Evaluating a point of view, decision, or information source	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Forming a new idea or understanding from various pieces of information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3. During the current school year, about how often have you done the following?

	Never	Sometimes	Often	Very Often
Combined ideas from different courses when completing assignments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Connected your learning to societal problems or issues	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Included diverse perspectives (political, religious, racial/ethnic, gender, etc.) in course discussions or assignments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Examined the strengths and weaknesses of your own views on a topic or issue	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tried to better understand someone else's views by imagining how an issue looks from his or her perspective	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Learned something that changed the way you understand an issue or concept	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Connected ideas from your courses to your prior experiences and knowledge	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. During the current school year, about how often have you done each of the following?

	Never	Sometimes	Often	Very Often
Identified key information from reading assignments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reviewed your notes after class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Summarized what you learned in class or from course material	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. During the current school year, about how often have you done the following?

	Never	Sometimes	Often	Very Often
Reached conclusions based on your own analysis of numerical information (numbers, graphs, statistics, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Used numerical information to examine a real-world problem or issue (unemployment, climate change, public health, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Evaluated what others have concluded from numerical information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

6. About how often have you had serious conversations with people who differ from you in the following ways?

	Never	Sometimes	Often	Very Often
Political views	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Economic and social background	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Religious beliefs or philosophy of life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Race, ethnic background, or country of origin	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sexual orientation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7. During the current school year, about how often have you done each of the following?

	Never	Sometimes	Often	Very Often
Asked another student to help you understand course material	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Explained course material to one or more students	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Prepared for exams by discussing or working through course material with students	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Worked with other students on course projects or assignments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

8. During the current school year, about how often have you done the following?

	Never	Sometimes	Often	Very Often
--	-------	-----------	-------	------------

Talked about career plans with a faculty member	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Worked with a faculty member on activities other than coursework (committees, student groups, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discussed course topics, ideas, or concepts with a faculty member outside of class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discussed your academic performance with a faculty member	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9. During the current school year, to what extent have your instructors done the following?

	Never	Sometimes	Often	Very Often
Clearly explained course goals and requirements	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Taught course sessions in an organized way	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Used examples or illustrations to explain difficult points	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Provided prompt and detailed feedback on tests or completed assignments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

10. Indicate the quality of your interactions with the following at CSU. Response options: Poor (1) to Very Good (4), Not Applicable

	Poor	Fair	Good	Very Good	Not Applicable
Students	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Academic Advisors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Faculty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Student services staff (campus activities, housing, career services, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other administrative staff and offices (register, financial aid, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

11. How much does CSU emphasize each of the following?

	Very Little	Some	Quite a Bit	Very Much
Providing support you need to help you succeed academically	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Using learning support services (writing center, tutoring services, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Having contact among students from different backgrounds (social, racial/ethnic, religious, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Providing opportunities to be involved socially	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Providing support for your overall well-being (recreation, healthcare, counseling, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Helping you manage your non-academic responsibilities (work, family, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Attending campus events and activities (special speakers, cultural performances, athletic events, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Attending events that address important social, economic, or political issues	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

12. Which of the following have you done or do you plan to do before you graduate?

	Have not decided	Do not plan to do	Plan to do	Done or in progress
Participate in an internship, co-op, field experience, student teaching, or clinical placement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hold a formal leadership role in a student organization or group	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Participate in a learning community or some other formal program where groups of students take two or more classes together	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Participate in a study abroad program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Work with a faculty member on a research project	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Complete a culminating senior experience (capstone, senior project or thesis, comprehensive exam, portfolio, etc.)

☐

☐

☐

☐

13. Indicate your level of agreement or disagreement with the following statements:

	Strongly Disagree	Disagree	Agree	Strongly Agree
Overall, the CSU campus is well designed (in terms of the landscape design as well as the placement, size, and relationships of the buildings and other physical features within the landscape)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The CSU campus is beautiful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The CSU campus has mostly great architecture	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The CSU campus has great landscape and outdoor spaces	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Most of the buildings on the CSU campus serve their purpose well	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There are many great interior public spaces on the CSU campus	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

14. What do you like best about the CSU campus? Why?

15. What are your favorite physical features of the CSU campus and surrounding area - special places that are meaningful to you?

16. What issues do you feel will most affect the CSU campus and surrounding area in the next five years - internal and external?

17. In your opinion, what physical features of the CSU campus and surrounding area should be enhanced or changed? Why?

18. What is currently missing from your long-term vision of the CSU campus and surrounding area?

19. At the end of the next five years, what would you like the CSU campus and surrounding area to be?

20. What is your major or intended major?

21. What have most of your grades been up to now at CSU? Response options:

- ☐ A
- ☐ A-
- ☐ B+
- ☐ B
- ☐ B-
- ☐ C+
- ☐ C
- ☐ C-
- ☐ Lower than C-

22. What is your gender?

- ☐ Male
- ☐ Female

23. How old are you?

- ☐ 18-19
- ☐ 20-21
- ☐ 22-23
- ☐ 24 or older

24. Are you an international student or foreign national? Response options: Yes, No

- ☐ Yes
- ☐ No

25. Which of the following describes where you are living while attending college?

- ☐ a. Dormitory or other campus housing (not fraternity or sorority house)
- ☐ b. Fraternity house
- ☐ c. Residence (house, apartment, etc.) within walking distance to the CSU campus
- ☐ d. Residence (house, apartment, etc.) farther than walking distance to CSU campus
- ☐ e. None of the above

26. What is your racial or ethnic identification? (Mark only one)

- ☐ a. American Indian or other Native American
- ☐ b. Asian, Asian American, or Pacific Islander
- ☐ c. Black or African American
- ☐ d. White (non-Hispanic)



- ☐ e. Mexican or Mexican American
- ☐ f. Puerto Rican
- ☐ g. Other Hispanic or Latino
- ☐ h. Multiracial
- ☐ i. Other
- ☐ j. I prefer not to respond

27. What is your current classification?

- ☐ Freshman/first-year
- ☐ Sophomore
- ☐ Junior
- ☐ Senior
- ☐ Unclassified

28. Thinking about your current academic term, are you a full-time student? Response options: Yes, No

- ☐ Yes
- ☐ No

Click to submit survey. Thank you very much for sharing your responses.

End of Survey

## Appendix G: Descriptive Statistics of Likert-type Items

Descriptive Statistics							
	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
I feel relaxed when I'm on the CSU campus	415	1.00	4.00	3.0916	.67122	-.639	.120
The CSU campus is a reflection of me	413	1.00	4.00	2.6150	.75329	-.362	.120
This campus provides many of the opportunities to engage in my favorite activities	412	1.00	4.00	2.9417	.72260	-.379	.120
This campus says very little about who I am	413	1.00	4.00	2.2228	.80277	.396	.120
I am happy when I am on the CSU campus	413	1.00	4.00	3.0799	.65055	-.346	.120
The CSU campus is one my favorite places to be	414	1.00	4.00	2.6570	.81347	-.027	.120
I can really be myself on the CSU campus	414	1.00	4.00	2.9469	.70767	-.501	.120
This campus is not a good place to do the things I most like to do	415	1.00	4.00	2.0723	.77683	.402	.120
This campus reflects the type of person I am	415	1.00	4.00	2.6819	.71224	-.297	.120
As far as I am concerned, there is no better place to be than on the CSU campus	415	1.00	4.00	2.1133	.77347	.306	.120
I really miss the CSU campus when I'm away from it for a long time	417	1.00	4.00	2.4676	.84611	-.006	.120
Applying facts, theories, or methods to practical problems or new situations	414	1.00	4.00	2.8406	.89046	-.240	.120
Analyzing an idea, experience, or line of reasoning in depth by examining its basic parts	412	1.00	4.00	2.8519	.85146	-.330	.120

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
Evaluating a point of view, decision, or information source	414	1.00	4.00	2.8019	.93591	-.308	.120
Forming a new idea or understanding from various pieces of information	414	1.00	4.00	2.9589	.88613	-.507	.120
Combined ideas from different courses when completing assignments	414	1.00	4.00	3.0652	.80441	-.371	.120
Connected your learning to societal problems or issues	413	1.00	4.00	2.8475	.88322	-.164	.120
Included diverse perspectives in course discussions or assignments	414	1.00	4.00	2.5700	.97855	-.003	.120
Examined the strengths and weaknesses of your own views on a topic or issue	412	1.00	4.00	2.7791	.83550	-.220	.120
Tried to better understand someone else's views by imagining issue from their perspective	414	1.00	4.00	2.8865	.85748	-.312	.120
Learned something that changed the way you understand an issue or concept	413	1.00	4.00	3.0169	.77410	-.250	.120
Connected ideas from your courses to your prior experiences and knowledge	415	1.00	4.00	3.1855	.75616	-.491	.120
Identified key information from reading assignments	412	1.00	4.00	2.9053	.84189	-.262	.120
Reviewed your notes after class	413	1.00	4.00	2.6271	.94840	.051	.120
Summarized what you learned in class or from course material	413	1.00	4.00	2.5956	.92363	.033	.120
Reached conclusions based on your own analysis of numerical information	414	1.00	4.00	2.3623	.94862	.314	.120
Used numerical information to examine a real-world problem or issue	413	1.00	4.00	2.2252	.96801	.423	.120

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
Evaluated what others have concluded from numerical information	415	1.00	4.00	2.3446	.93732	.254	.120
Political views	415	1.00	4.00	2.4747	.89211	.169	.120
Economic and social background	414	1.00	4.00	2.6449	.87306	.010	.120
Religious beliefs or philosophy of life	415	1.00	4.00	2.6458	.92592	-.047	.120
Race, ethnic background, or country of origin	412	1.00	4.00	2.4903	.92933	.156	.120
Sexual orientation	413	1.00	4.00	2.2107	.92782	.504	.120
Asked another student to help you understand course material	415	1.00	4.00	2.5133	.87044	.257	.120
Explained course material to one or more students	415	1.00	4.00	2.7422	.80068	.016	.120
Prepared for exams by discussing or working through course material with students	413	1.00	4.00	2.4988	.96196	.045	.120
Worked with other students on course projects or assignments	415	1.00	4.00	2.7566	.88249	-.098	.120
Talked about career plans with a faculty member	384	1.00	4.00	2.2031	.85527	.428	.125
Worked with a faculty member on activities other than coursework	384	1.00	4.00	1.8906	.99792	.776	.125
Discussed course topics, ideas, or concepts with a faculty member outside of class	384	1.00	4.00	2.0495	.85817	.553	.125
Discussed your academic performance with a faculty member	384	1.00	4.00	2.0286	.82817	.612	.125

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
Clearly explained course goals and requirements	384	1.00	4.00	3.0911	.70398	-.220	.125
Taught course sessions in an organized way	382	1.00	4.00	3.0890	.71168	-.350	.125
Used examples or illustrations to explain difficult points	384	1.00	4.00	3.1667	.71780	-.301	.125
Provided prompt and detailed feedback on tests or completed assignments	383	1.00	4.00	2.7885	.78911	.040	.125
Quality of interactions with Students	379	1.00	4.00	3.3694	.75643	-1.025	.125
Quality of interactions with Academic Advisors	376	1.00	4.00	2.9468	.96185	-.454	.126
Quality of interactions with Faculty	377	1.00	4.00	3.1061	.80516	-.564	.126
Quality of interactions with Student services staff	336	1.00	4.00	2.8482	.92601	-.443	.133
Quality of interactions with Other administrative staff and offices	339	1.00	4.00	2.7994	.93004	-.367	.132
CSU emphasize Providing support you need to help you succeed academically	384	1.00	4.00	2.8516	.76226	-.276	.125
CSU emphasize Using learning support services	383	1.00	4.00	2.7807	.85550	-.168	.125
CSU emphasize Having contact among students from different backgrounds	382	1.00	4.00	2.3613	.90804	.175	.125
CSU emphasize Providing opportunities to be involved socially	383	1.00	4.00	2.8773	.82695	-.243	.125
CSU emphasize Providing support for your overall well-being	380	1.00	4.00	2.8947	.86837	-.427	.125

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
CSU emphasize Helping you manage your non-academic responsibilities	384	1.00	4.00	1.9271	.89378	.629	.125
CSU emphasize Attending campus events and activities	384	1.00	4.00	2.7630	.85110	-.139	.125
CSU emphasize Attending events that address important social, economic, or political issues	384	1.00	4.00	2.3750	.87912	.258	.125
Participate in an internship, co-op, field experience, student teaching, or clinical placement	383	1.00	4.00	3.0104	.81536	-.922	.125
Hold a formal leadership role in a student organization or group	381	1.00	4.00	2.6168	1.06876	.070	.125
Participate in a learning community or some other formal program	382	1.00	4.00	2.3482	1.00484	.476	.125
Participate in a study abroad program	380	1.00	4.00	2.2053	.85951	.369	.125
Work with a faculty member on a research project	381	1.00	4.00	2.2703	.99889	.281	.125
Complete a culminating senior experience	383	1.00	4.00	2.8616	.90904	-.774	.125
Overall, the CSU campus is well designed	375	1.00	4.00	2.9893	.68200	-.597	.126
The CSU campus is beautiful	383	1.00	4.00	3.3081	.65850	-.759	.125
The CSU campus has mostly great architecture	381	1.00	4.00	2.8766	.72765	-.466	.125
The CSU campus has great landscape and outdoor spaces	381	1.00	4.00	3.2651	.68099	-.739	.125
Most of the buildings on the CSU campus serve their purpose well	382	1.00	4.00	3.0026	.70431	-.593	.125

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
There are many great interior public spaces on the CSU campus	381	1.00	4.00	2.9344	.72431	-.360	.125
Valid N (listwise)	247						

## Appendix H: Frequencies for Demographic Variables of Study Respondents

Gender					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	115	20.6	30.9	30.9
	Female	257	46.1	69.1	100.0
	Total	372	66.8	100.0	
Missing	-99	2	.4		
	System	183	32.9		
	Total	185	33.2		
Total		557	100.0		



Age					
		Frequency	Percent	Valid Percent	Cumulative Percent
	18-19	105	18.9	28.2	28.2
	20-21	135	24.2	36.3	64.5
	22-23	80	14.4	21.5	86.0
	24 or older	52	9.3	14.0	100.0
Valid	Total	372	66.8	100.0	
	-99.00	2	.4		
	System	183	32.9		
Missing	Total	185	33.2		
Total		557	100.0		

Where you are living while attending college					
		Frequency	Percent	Valid Percent	Cumulative Percent
	a. Dormitory or other campus housing	91	16.3	24.6	24.6
	b. Fraternity house	11	2.0	3.0	27.6
	c. Residence (house, apartment,	114	20.5	30.8	58.4
	d. Residence (house, apartment,	148	26.6	40.0	98.4
	e. None of the above	6	1.1	1.6	100.0
Valid	Total	370	66.4	100.0	
	-99	4	.7		
	System	183	32.9		
Missing	Total	187	33.6		
Total		557	100.0		

Racial or ethnic identification?					
		Frequency	Percent	Valid Percent	Cumulative Percent
	a. American Indian or other Native American	3	.5	.8	.8
	b. Asian, Asian American, or Pacific Islander	3	.5	.8	1.6
	c. Black or African American	5	.9	1.3	3.0
	d. White (non-Hispanic)	307	55.1	82.7	85.7
	e. Mexican or Mexican American	11	2.0	3.0	88.7
	f. Puerto Rican	2	.4	.5	89.2
	g. Other Hispanic or Latino	10	1.8	2.7	91.9
	h. Multiracial	4	.7	1.1	93.0
	i. Other	9	1.6	2.4	95.4
	j. I prefer not to respond	17	3.1	4.6	100.0
Valid	Total	371	66.6	100.0	
	-99	3	.5		
	System	183	32.9		
Missing	Total	186	33.4		
Total		557	100.0		

Current classification?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Freshman/first-year	84	15.1	22.6	22.6
	Sophomore	75	13.5	20.2	42.9
	Junior	94	16.9	25.3	68.2
	Senior	114	20.5	30.7	98.9
	Unclassified	4	.7	1.1	100.0
	Total	371	66.6	100.0	
Missing	-99	3	.5		
	System	183	32.9		
	Total	186	33.4		
Total		557	100.0		

Full-time student?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	21	3.8	5.7	5.7
	Yes	349	62.7	94.3	100.0
	Total	370	66.4	100.0	
Missing	-99	4	.7		
	System	183	32.9		
	Total	187	33.6		
Total		557	100.0		

## Appendix I: Descriptive Statistics of Derived Variables

Descriptive Statistics							
	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
Sense of Place	397	1.55	3.45	2.6233	.37440	-.193	.122
Place attachment	410	1.00	4.00	2.8232	.60318	-.102	.121
Place identity	407	1.25	4.00	2.6167	.35165	-.361	.121
Place dependence	410	1.33	3.67	2.3740	.33451	-.042	.121
Campus design	383	1.00	4.00	3.0611	.52864	-.447	.125
Student Engagement	415	1.60	3.79	2.6626	.37518	.181	.120
Higher order learning	412	1.00	4.00	2.8677	.67932	-.278	.120
Academic Challenge	399	1.35	4.00	2.7647	.48636	.093	.122
Reflect	405	1.14	4.00	2.9090	.61329	-.107	.121
Learning strategies	412	1.00	4.00	2.7104	.71347	.105	.120
Quantitative reasoning	412	1.00	4.00	2.3091	.82076	.372	.120
Learning With Peers	407	1.22	4.00	2.5594	.55543	.096	.121
Diverse interactions	409	1.00	4.00	2.4954	.69466	.121	.121
Collaborative learning	413	1.00	4.00	2.6301	.69707	.110	.120
Experience With Faculty	381	1.50	4.00	2.5338	.50226	.623	.125
Student faculty interactions	384	1.00	4.00	2.0430	.72451	.772	.125
Good teaching practice	381	1.50	4.00	3.0322	.60436	.028	.125
Campus Environment	384	1.31	4.31	2.8069	.52838	-.067	.125
Quality of Interactions	384	1.40	4.80	3.1316	.63923	-.435	.125
Supportive environment	384	1.00	4.00	2.6037	.62010	.210	.125
High Impact Practices	383	1.00	3.83	2.5537	.54409	-.032	.125
Valid N (listwise)	346						

## Appendix J: Exploratory Factor Analysis

Pattern Matrix <sup>a</sup>													
	Factor												
	1	2	3	4	5	6	7	8	9	10	11	12	13
●The CSU campus is a reflection of me	.849												
●This campus reflects the type of person I am	.820												
●Reversed-This campus says very little about who I am	.782												
●As far as I am concerned, there is no better place to be than on the CSU campus	.781												
●The CSU campus is one my favorite places to be	.775												
●Reversed-This campus not a good place to do the things I most like to do	.750												
● I am happy when I am on the CSU campus	.685												
● I really miss the CSU campus when I'm away from it for a long time	.665												
●I feel relaxed when I'm on the CSU campus	.624												
●This campus provides many of the opportunities to engage in my favorite activities	.609												

	Factor												
	1	2	3	4	5	6	7	8	9	10	11	12	13
●I can really be myself on the CSU campus	.566												
●CSU emphasizes attending events that address important social, economic, or political issues		.798											
●CSU emphasize Helping you manage your non-academic responsibilities		.734											
●CSU emphasizes attending campus events and activities		.732											
●CSU emphasizes providing opportunities to be involved socially		.728											
●CSU emphasizes providing support for your overall well-being		.667											
●CSU emphasizes using learning support services		.523											
●CSU emphasizes having contact among students from different backgrounds		.503											
●CSU emphasizes providing support you need to help you succeed academically		.399											
●Participate in a study abroad program													
●Economic and social background			.860										



	Factor												
	1	2	3	4	5	6	7	8	9	10	11	12	13
●Religious beliefs or philosophy of life			.784										
●Political views			.706										
●Race, ethnic background, or country of origin			.695										
●Sexual orientation			.552										
●Overall, the CSU campus is well designed				.803									
●The CSU campus has mostly great architecture				.687									
●The CSU campus is beautiful				.677									
●Most of the buildings on the CSU campus serve their purpose well				.652									
●The CSU campus has great landscape and outdoor spaces				.628									
●There are many great interior public spaces on the CSU campus				.598									
●Taught course sessions in an organized way					.893								
●Used examples or illustrations to explain difficult points					.785								
●Clearly explained course goals and requirements					.743								

	Factor												
	1	2	3	4	5	6	7	8	9	10	11	12	13
●Provided prompt and detailed feedback on tests or completed assignments					.599								
●Tried to better understand someone else's views by imagining issue from their perspective						.920							
●Examined the strengths and weaknesses of your own views on a topic or issue						.765							
●Included diverse perspectives in course discussions or assignments						.717							
●Learned something that changed the way you understand an issue or concept						.485							
●Connected ideas from your courses to your prior experiences and knowledge						.468		.304					
●Connected your learning to societal problems or issues						.444							
●Discussed your academic performance with a faculty member							.764						
●Discussed course topics, ideas, or concepts with a faculty member outside of							.709						

	Factor												
	1	2	3	4	5	6	7	8	9	10	11	12	13
class													
<ul style="list-style-type: none"> <li>•Worked with a faculty member on activities other than coursework</li> </ul>							.673						
<ul style="list-style-type: none"> <li>•Talked about career plans with a faculty member</li> </ul>							.647						
<ul style="list-style-type: none"> <li>•Participate in a learning community or some other formal program</li> </ul>													
<ul style="list-style-type: none"> <li>•Applying facts, theories, or methods to practical problems or new situations</li> </ul>								.826					
<ul style="list-style-type: none"> <li>•Analyzing an idea, experience, or line of reasoning in depth by examining its basic parts</li> </ul>								.813					
<ul style="list-style-type: none"> <li>•Forming a new idea or understanding from various pieces of information</li> </ul>								.591					
<ul style="list-style-type: none"> <li>•Evaluating a point of view, decision, or information source</li> </ul>								.481					
<ul style="list-style-type: none"> <li>•Combined ideas from different courses when completing assignments</li> </ul>								.312					
<ul style="list-style-type: none"> <li>•Asked another student to help you</li> </ul>									.690				

	Factor												
	1	2	3	4	5	6	7	8	9	10	11	12	13
understand course material													
•Worked with other students on course projects or assignments									.659				
•Prepared for exams by discussing or working through course material with students									.633				
•Explained course material to one or more students									.577				
•Quality of interactions with students									.333				
•Quality of interactions with Faculty										.778			
•Quality of interactions with other administrative staff and offices										.749			
•Quality of interactions with Student services staff										.641			
•Quality of interactions with Academic Advisors										.508			
•Used numerical information to examine a real-world problem or issue.											.796		
•Evaluated what others have concluded from numerical information.											.715		
•Reached conclusions based on your own analysis of numerical											.707		

	Factor												
	1	2	3	4	5	6	7	8	9	10	11	12	13
information.													
●Reviewed your notes after class.												.728	
●Summarized what you learned in class or from course material.												.687	
●Identified key information from reading assignments.												.398	
●Complete a culminating senior experience.												.593	
●Work with a faculty member on a research project.												.476	
●Hold a formal leadership role in a student organization or group.												.420	
●Participate in an internship, co-op, field experience, student teaching, or clinical placement.												.354	

Extraction Method: Principal Axis Factoring.

Rotation Method: Promax with Kaiser Normalization.

a. Rotation converged in 8 iterations.

## Appendix K: Correlations Among Variables

Correlations <sup>c</sup>				
		Sense of Place	Place	Place identity
Sense of Place	Pearson Correlation	1	.938**	.828**
	Sig. (2-tailed)		.000	.000
Place attachment	Pearson Correlation	.938**	1	.658**
	Sig. (2-tailed)	.000		.000
Place identity	Pearson Correlation	.828**	.658**	1
	Sig. (2-tailed)	.000	.000	
Place dependence	Pearson Correlation	.679**	.512**	.404**
	Sig. (2-tailed)	.000	.000	.000
Campus design	Pearson Correlation	.518**	.509**	.426**
	Sig. (2-tailed)	.000	.000	.000
Academic Challenge	Pearson Correlation	.275**	.276**	.241**
	Sig. (2-tailed)	.000	.000	.000
Learning With Peers	Pearson Correlation	.227**	.234**	.193**
	Sig. (2-tailed)	.000	.000	.000
Experience With Faculty	Pearson Correlation	.321**	.310**	.285**
	Sig. (2-tailed)	.000	.000	.000
Campus Environment	Pearson Correlation	.499**	.467**	.433**
	Sig. (2-tailed)	.000	.000	.000
High Impact Practices	Pearson Correlation	.273**	.262**	.235**
	Sig. (2-tailed)	.000	.000	.000

Correlations <sup>c</sup>				
		Place dependence	Campus design	Academic Challenge
	Pearson Correlation	.679	.518**	.275**
Sense of Place	Sig. (2-tailed)	.000	.000	.000
	Pearson Correlation	.512**	.509	.276**
Place attachment	Sig. (2-tailed)	.000	.000	.000
	Pearson Correlation	.404**	.426**	.241
Place identity	Sig. (2-tailed)	.000	.000	.000
	Pearson Correlation	1**	.301**	.122**
Place dependence	Sig. (2-tailed)		.000	.024
	Pearson Correlation	.301**	1**	.237**
Campus design	Sig. (2-tailed)	.000		.000
	Pearson Correlation	.122**	.237**	1**
Academic Challenge	Sig. (2-tailed)	.024	.000	
	Pearson Correlation	.095**	.166**	.492**
Learning With Peers	Sig. (2-tailed)	.077	.002	.000
	Pearson Correlation	.167**	.222**	.470**
Experience With Faculty	Sig. (2-tailed)	.002	.000	.000
	Pearson Correlation	.315**	.472**	.330**
Campus Environment	Sig. (2-tailed)	.000	.000	.000
	Pearson Correlation	.158**	.049**	.225**
High Impact Practices	Sig. (2-tailed)	.003	.364	.000

Correlations <sup>c</sup>				
		Learning With Peers	Experience With Faculty	Campus Environment
Sense of Place	Pearson Correlation	.227	.321**	.499**
	Sig. (2-tailed)	.000	.000	.000
Place attachment	Pearson Correlation	.234**	.310	.467**
	Sig. (2-tailed)	.000	.000	.000
Place identity	Pearson Correlation	.193**	.285**	.433
	Sig. (2-tailed)	.000	.000	.000
Place dependence	Pearson Correlation	.095**	.167**	.315**
	Sig. (2-tailed)	.077	.002	.000
Campus design	Pearson Correlation	.166**	.222**	.472**
	Sig. (2-tailed)	.002	.000	.000
Academic Challenge	Pearson Correlation	.492**	.470**	.330**
	Sig. (2-tailed)	.000	.000	.000
Learning With Peers	Pearson Correlation	1**	.362**	.262**
	Sig. (2-tailed)		.000	.000
Experience With Faculty	Pearson Correlation	.362**	1**	.446**
	Sig. (2-tailed)	.000		.000
Campus Environment	Pearson Correlation	.262**	.446**	1**
	Sig. (2-tailed)	.000	.000	
High Impact Practices	Pearson Correlation	.192**	.351**	.143**
	Sig. (2-tailed)	.000	.000	.008
Correlations <sup>c</sup>				



		High Impact Practices
Sense of Place	Pearson Correlation	.273
	Sig. (2-tailed)	.000
Place attachment	Pearson Correlation	.262**
	Sig. (2-tailed)	.000
Place identity	Pearson Correlation	.235**
	Sig. (2-tailed)	.000
Place dependence	Pearson Correlation	.158**
	Sig. (2-tailed)	.003
Campus design	Pearson Correlation	.049**
	Sig. (2-tailed)	.364
Academic Challenge	Pearson Correlation	.225**
	Sig. (2-tailed)	.000
Learning With Peers	Pearson Correlation	.192**
	Sig. (2-tailed)	.000
Experience With Faculty	Pearson Correlation	.351**
	Sig. (2-tailed)	.000
Campus Environment	Pearson Correlation	.143**
	Sig. (2-tailed)	.008
High Impact Practices	Pearson Correlation	1**
	Sig. (2-tailed)	

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

c. Listwise N=346

## Appendix L: Correlations Between Grades and Key Variables

		Correlations							
		Grades up to now at CSU	Sense of Place	Campus design	Academic Challenge	Learning With Peers	Experience With Faculty	Campus Environ- ment	High Impact Practice s
Grades up to now at CSU	Pearson Correlation	1	.023	-.012	.145**	.110*	.139**	.145**	.130*
	Sig. (2- tailed)		.672	.812	.006	.037	.008	.005	.013
	N	368	352	366	354	360	364	367	366
Sense of Place	Pearson Correlation	.023	1	.508**	.257**	.212**	.317**	.488**	.254**
	Sig. (2- tailed)	.672		.000	.000	.000	.000	.000	.000
	N	352	397	367	384	389	364	367	366
Campus design	Pearson Correlation	-.012	.508**	1	.224**	.183**	.238**	.444**	.079
	Sig. (2- tailed)	.812	.000		.000	.000	.000	.000	.123
	N	366	367	383	368	375	380	383	382
Academic Challenge	Pearson Correlation	.145**	.257**	.224**	1	.485**	.454**	.331**	.217**
	Sig. (2- tailed)	.006	.000	.000		.000	.000	.000	.000
	N	354	384	368	399	391	367	369	368
Learning With Peers	Pearson Correlation	.110*	.212**	.183**	.485**	1	.350**	.270**	.179**
	Sig. (2- tailed)	.037	.000	.000	.000		.000	.000	.000
	N	360	389	375	391	407	373	376	375
Experience With Faculty	Pearson Correlation	.139**	.317**	.238**	.454**	.350**	1	.446**	.369**
	Sig. (2- tailed)	.008	.000	.000	.000	.000		.000	.000

		Grades up to now at CSU	Sense of Place	Campus design	Academic Challenge	Learning With Peers	Experience With Faculty	Campus Environ- ment	High Impact Practice s
Campus Environ- ment	N	364	364	380	367	373	381	381	380
	Pearson Correlation	.145**	.488**	.444**	.331**	.270**	.446**	1	.156**
	Sig. (2- tailed)	.005	.000	.000	.000	.000	.000		.002
High Impact Practices	N	367	367	383	369	376	381	384	383
	Pearson Correlation	.130*	.254**	.079	.217**	.179**	.369**	.156**	1
	Sig. (2- tailed)	.013	.000	.123	.000	.000	.000	.002	
N		366	366	382	368	375	380	383	383

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

## Appendix M: Survey Cover Letter (Email Invitation to participate and consent)

Hello!

My name is Dan Okoli, a current doctoral student at CSU in the School of Education. We are conducting a research study to explore how sense of place is related to student engagement among undergraduate students at CSU. The title of our project is *sense of place and student engagement among undergraduate students at large research university*.

The Principal Investigator is James H. Banning, School of Education Faculty, CSU (phone: 970 -491-7153/ email: [banning@cahs.colostate.edu](mailto:banning@cahs.colostate.edu)) and the Co-Principal Investigator is Dan Okoli, PhD student in Education, CSU (phone: 608-338-8787/email: [dtokoli@yahoo.com](mailto:dtokoli@yahoo.com)) .

We would like you to take an anonymous online survey. Participation will take approximately 10-15 minutes. Your participation in this research is voluntary. If you decide to participate in the study, you may withdraw your consent and stop participation at any time without penalty. We will not collect your name or personal identifiers. When we report and share the data to others, we will combine the data from all participants.

While there are no direct benefits to you, we hope to gain more knowledge on the relationship between sense of place as an attitude toward the physical campus environment and student engagement among undergraduate students at CSU. Sense of place refers to the emotional bonding that exists between an individual or group and a geographic location. In this study, the sense of place of students is compared to their level of engagement specifically for CSU. There are no known risks for participating. It is not possible to identify all potential risks in research procedures, but the researcher(s) have taken reasonable safeguards to minimize any known and potential, but unknown, risks.

To indicate your consent to participate in this research and to continue on to the survey, please click here: < \$(Scannell & Gifford) > Or copy and paste the URL below into your internet browser: \${1://SurveyURL}

If you have any questions about the research, please contact Jim Banning at (phone: 970-491-7153/email: [banning@cahs.colostate.edu](mailto:banning@cahs.colostate.edu)) or Dan Okoli (phone: 608-338-8787/email: [dtokoli@yahoo.com](mailto:dtokoli@yahoo.com)). If you have any questions about your rights as a volunteer in this research, contact Janell Barker, Human Research Administrator, at 970-491-1655.

Participation is entirely voluntary. You can expect two follow-up reminders about the survey. The survey will close on March 31, 2013.

Thank you in advance for your consideration of this request.

James H. Banning  
(Professor/PI)

Daniel T. Okoli  
(PhD Student/Co-PI)

## Appendix N: First Email Reminder

Hello again,

This is a reminder message about the survey you have been randomly selected to receive. I hope you will take the time to read my email and consider participating!

My name is Dan Okoli, a current doctoral student at CSU in the School of Education. We are conducting a research study to explore how sense of place is related to student engagement among undergraduate students at CSU. The title of our project is *sense of place and student engagement among undergraduate students at large research university*.

The Principal Investigator is James H. Banning, School of Education Faculty, CSU (phone: 970 -491-7153/ email: [banning@cahs.colostate.edu](mailto:banning@cahs.colostate.edu)) and the Co-Principal Investigator is Dan Okoli, PhD student in Education, CSU (phone: 608-338-8787/email: [dtokoli@yahoo.com](mailto:dtokoli@yahoo.com))

We would like you to take an anonymous online survey. Participation will take approximately 10-15 minutes. Your participation in this research is voluntary. If you decide to participate in the study, you may withdraw your consent and stop participation at any time without penalty. We will not collect your name or personal identifiers. When we report and share the data to others, we will combine the data from all participants.

While there are no direct benefits to you, we hope to gain more knowledge on the relationship between sense of place as an attitude toward the physical campus environment and student engagement among undergraduate students at CSU. Sense of place refers to the emotional bonding that exists between an individual or group and a geographic location. In this study, the sense of place of students is compared to their level of engagement specifically for CSU. There are no known risks for participating. It is not possible to identify all potential risks in research procedures, but the researcher(s) have taken reasonable safeguards to minimize any known and potential, but unknown, risks.

To indicate your consent to participate in this research and to continue on to the survey, please click here: <\${L://SurveyLink?d=Take the Survey}>

Or copy and paste the URL below into your internet browser:

`${L://SurveyURL}`

If you have any questions about the research, please contact Jim Banning at (phone: 970-491-7153/email: [banning@cahs.colostate.edu](mailto:banning@cahs.colostate.edu)) or Dan Okoli (phone: 608-338-8787/email: [dtokoli@yahoo.com](mailto:dtokoli@yahoo.com)). If you have any questions about your rights as a volunteer in this research, contact Janell Barker, Human Research Administrator, at 970-491-1655.

Thank you in advance for your consideration of this request.

James H. Banning  
(Professor/PI)

Daniel T. Okoli  
(PhD Student/Co-PI)

## Appendix O: Second Email Reminder

Hello again,

This is a reminder message about the survey you have been randomly selected to receive. I hope you will take the time to read my email and consider participating!

My name is Dan Okoli, a current doctoral student at CSU in the School of Education. We are conducting a research study to explore how sense of place is related to student engagement among undergraduate students at CSU. The title of our project is *sense of place and student engagement among undergraduate students at large research university*.

The Principal Investigator is James H. Banning, School of Education Faculty, CSU (phone: 970 -491-7153/ email: [banning@cahs.colostate.edu](mailto:banning@cahs.colostate.edu) ) and the Co-Principal Investigator is Dan Okoli, PhD student in Education, CSU (phone: 608-338-8787/email: [dtokoli@yahoo.com](mailto:dtokoli@yahoo.com))

We would like you to take an anonymous online survey. Participation will take approximately 10-15 minutes. Your participation in this research is voluntary. If you decide to participate in the study, you may withdraw your consent and stop participation at any time without penalty.

We will not collect your name or personal identifiers. When we report and share the data to others, we will combine the data from all participants.

While there are no direct benefits to you, we hope to gain more knowledge on the relationship between sense of place as an attitude toward the physical campus environment and student engagement among undergraduate students at CSU. Sense of place refers to the emotional bonding that exists between an individual or group and a geographic location. In this study, the sense of place of students is compared to their level of engagement specifically for CSU. There are no known risks for participating. It is not possible to identify all potential risks in research procedures, but the researcher(s) have taken reasonable safeguards to minimize any known and potential, but unknown, risks.

To indicate your consent to participate in this research and to continue on to the survey, please click here: <\${l://SurveyLink?d=Take the Survey}>

Or copy and paste the URL below into your internet browser:

`${l://SurveyURL}`

If you have any questions about the research, please contact Jim Banning at (phone: 970-491-7153/email: [banning@cahs.colostate.edu](mailto:banning@cahs.colostate.edu) ) or Dan Okoli (phone: 608-338-8787/email: [dtokoli@yahoo.com](mailto:dtokoli@yahoo.com) ). If you have any questions about your rights as a volunteer in this research, contact Janell Barker, Human Research Administrator, at 970-491-1655.

Thank you in advance for your consideration of this request.

James H. Banning  
(Professor/PI)

Daniel T. Okoli  
(PhD Student/Co-PI)

## Appendix P: Institutional Review Board Exempt Letter



Research Integrity & Compliance  
Review Office Office  
of Vice President for  
Research Fort Collins,  
CO 80523-2011  
(970) 491-1553  
FAX (970) 491-2293

Date: March 1, 2013

To: Dr. James Banning, School of Education  
Daniel Okoli, School of Education

A handwritten signature in cursive script that reads "Janell Barker".

From: Janell Barker, IRB Coordinator

Re: Sense of Place and Student Engagement among Undergraduate  
Students at a  
Large Research University

IRB ID: 031-14H

Review Date: March 1, 2013

---

The Institutional Review Board (IRB) Coordinator has reviewed this project and has declared the study exempt from the requirements of the human subject protections regulations as described in 45 CFR 46.101(b)(2): Research involving the use of educational tests,.... survey procedures, interview procedures or observation of public behavior, unless: a) **information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects.**

The IRB determination of exemption means that:

- You do not need to submit an application for annual continuing review.

- **You must carry out the research as proposed in the Exempt application,** including obtaining and documenting (signed) informed consent if stated in your application.
- **Any modification of this research should be submitted to the IRB Coordinator through an email prior to implementing any changes,** to determine if the project still meets the Federal criteria for exemption. If it is determined that exemption is no longer warranted, then an IRB protocol will need to be submitted and approved before proceeding with data collection.
- **Please notify the IRB Coordinator if any problems or complaints of the research occur.**

Please note that you must submit all research involving human participants for review by the IRB. **Only the IRB may make the determination of exemption**, even if you conduct a similar study in the future.



## Appendix Q: The College Student Report Item Usage Agreement



### *The College Student Report* Item Usage Agreement

The National Survey of Student Engagement's (NSSE) survey instrument, *The College Student Report*, is copyrighted and the copyright is owned by The Trustees of Indiana University. Any use of survey items contained within *The College Student Report* is prohibited without prior written permission from Indiana University. When fully executed, this Agreement constitutes written permission from the University, on behalf of NSSE, for the party named below to use an item or items from *The College Student Report* in accordance with the terms of this Agreement.

In consideration of the mutual promises below, the parties hereby agree as follows:

- 1) The University hereby grants **Dan Okoli** ("Licensee") a nonexclusive, worldwide, irrevocable license to use, reproduce, distribute, publicly display and perform, and create derivatives from, in all media now known or hereafter developed, the item(s) listed in the proposal attached as Exhibit A, solely for the purpose of including such item(s) in the survey activity described in Exhibit A, which is incorporated by reference into this Agreement. This license does not include any right to sublicense others. This license only covers the survey instrument, time frame, population, and other terms described in Exhibit A. Any different or repeated use of the item(s) shall require an additional license.
- 2) In exchange for the license granted in section 1, Licensee agrees:
  - a) there will be no licensing fee to use NSSE items for the purposes described in Exhibit A;
  - b) to provide to NSSE frequency distributions and means on the licensed item(s);
  - c) on the survey form itself, and in all publications or presentations of data obtained through the licensed item(s), to include the following citation: "Items xx and xx used with permission from *The College Student Report*, National Survey of Student Engagement, Copyright 2001-13 The Trustees of Indiana University";
  - d) to provide to NSSE a copy of any derivatives of, or alterations to, the item(s) that Licensee makes for the purpose of Licensee's survey ("modified items"), for NSSE's own nonprofit, educational purposes, which shall include the use of the modified items in *The College Student Report* or any other survey instruments, reports, or other educational or professional materials that NSSE may develop or use in the future. Licensee hereby grants the University a nonexclusive, worldwide, irrevocable, royalty-free license to use, reproduce, distribute, create derivatives from, and publicly display and perform the modified items, in any media now known or hereafter developed; and
  - e) to provide to NSSE, for its own nonprofit, educational purposes, a copy of all reports, presentations, analyses, or other materials in which the item(s) licensed under this

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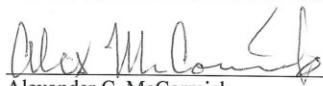


Agreement, or modified items, and any responses to licensed or modified items, are presented, discussed, or analyzed. NSSE shall not make public any data it obtains under this subsection in a manner that identifies specific institutions or individuals, except with the consent of the Licensee.

3) This Agreement expires on July 31, 2013.

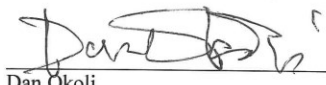
The undersigned hereby consent to the terms of this Agreement and confirm that they have all necessary authority to enter into this Agreement.

For The Trustees of Indiana University:

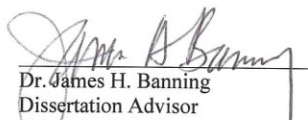
  
Alexander C. McCormick  
Director  
National Survey of Student Engagement

3/25/2013  
Date

For Licensee:

  
Dan Okoli  
PhD Student  
Colorado State University

04/29/2013  
Date

  
Dr. James H. Banning  
Dissertation Advisor  
Colorado State University

07/02/2013  
Date