

STUDENT ENGAGEMENT:  
USING THE NSSE BENCHMARKS TO INVESTIGATE LONGTERM  
PERSISTENCE

By

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April, 2009

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## GLOSSARY

Attrition - The loss of a student prior to degree attainment from their original college of enrollment.

First-time, Full-time Freshmen - A traditional aged student enrolled in an equivalent credit load of 12 credits or higher and who has not previously attended an institution of higher education in the pursuit of a degree.

Index Score - The student's average response to items within one of the five benchmarks of the NSSE after all items comprising the benchmark have been placed on a 100-point scale.

Outcome Measures - Estimates of what students have gained from their collegiate experience.

Institutional Culture - The set of shared attitudes, values, goals and practices that characterize an institution. These are primarily experienced through the thousands of interactions with members of the campus community which lead to common values being communicated.

Longterm Persistence - This type of persistence is used in reference to those students who continue with their full-time enrollment at a single institution of higher education into their junior year of study.

National Survey of Student Engagement (NSSE) - This tool documents dimensions of quality in undergraduate education and provides information and assistance to colleges and other organizations to improve student learning. Its primary activity is annually surveying college students to assess the extent to which they engage in educational practices associated with high levels of learning and personal development.

Persistence - Persevering with study towards degree completion by re-enrolling full-time (twelve credits) from one academic semester to the next. In this study only those who persevere at the institution at which the investigation takes place are included in this category and persistence is only monitored to the student's junior year.

Persister - An individual who is progressing towards degree completion by remaining enrolled in a fulltime status from one academic semester to the next.

Process Indicators - Measures of behaviors associated with desired outcomes of college that estimate the extent to which students are engaged in these activities.

Retention - refers to an institution of higher education successfully keeping a student enrolled in a full-time status, until degree attainment is reached.

Sophomore Student - A student who has successfully completed the course requirements of their first year of undergraduate study and is now enrolled in his or her second year of study.

Student Engagement - The frequency with which students are involved in activities that represent good educational practice and are related to positive learning outcomes, and the policies and practices that institutions use to induce students to take part in these activities. For the purpose of this study this construct is measured using the five benchmarks of the NSSE: (a) LAC, (b) ACL, (c) SFI, (d) EEE, and (e) SCE

Temporary Persistence - This type of persistence is used in reference to those students who continue with their full-time enrollment at an institution of higher education into their sophomore year but who subsequently fail to re-enroll at the same institute for their junior year of study.

## ABSTRACT

This study examined the relationship between student engagement and persistence for 362 first-time, full-time freshmen at a single institution of higher education. The enrollment status of the students was tracked through to the junior year of college. This allowed for three distinct groups of students to be identified for comparative purposes: non-persisters (students who failed to re-enroll at the institution after their freshman year); temporary persisters (students who re-enrolled in a fulltime status at the institution for their sophomore year but not for their junior year); and, longterm persisters (students who stayed enrolled at the institution in a fulltime status through to their junior year). A multinomial linear regression analysis compared the three groups across three models. The predictor variables used consist of: two measures of student engagement constructed from students' index scores on the National Survey of Student Engagement; students' ACT scores; parents' level of education; gender; and, residential status. Findings indicated that higher levels of engagement in the freshman year improve the likelihood of students persisting to the junior year regardless of the measured background characteristics. Higher index scores on the Supportive Campus Environment benchmark were found to be of central importance. These results support the notion that a focus on improving campus culture and on educational quality can help institutions improve retention rates. Also of importance, for temporary persisters the regression analysis highlighted the need for institutions to be more attentive to students' experiences of living on campus. Further research into the effects of living on campus on this group of students is recommended.

## CHAPTER ONE

### INTRODUCTION

In higher education the importance of students persevering with study towards graduation has received considerable attention around the world. In the United States alone, questions relating to the topic have guided research efforts for over fifty years (Pascarella & Terenzini, 1991, 2005; Yorke and Longden, 2004). This is understandable as this form of persistence has many stakeholders. Chief among these are students, institutions of education, employers, and governments (Longden, 2002; Yorke & Longden, 2004). Higher degrees of educational attainment for students equate to increases in the quality of life available to them. For an institution, increased graduation rates positively affect the societal perceptions of the institution's value. Also, the ability to retain students from one semester to the next impacts upon the financial stability of the institution and return on resources already spent. Employers desire educated employees who will not represent a cost to an organization before they are able to complete the duties for which they were employed. Finally, governments which adopt a human capital approach to higher education see course completion rates as measures of the nation's economic success (Longden, 2002; Yorke & Longden, 2004).

In a study that sought to examine student and institutional conditions that foster student success, Kuh, Cruce, Shoup, Kinzie and Gonyea (2007a) stated that:

A college degree has replaced the high school diploma as a mainstay for economic self-sufficiency and responsible citizenship. In addition, earning a bachelor's degree is linked to long-term cognitive, social, and economic benefits to individuals, benefits that are passed on to future generations, enhancing the quality of life of the families of college-educated persons, the communities in which they live, and the larger society. (p. 3)

### The Importance of Higher Education in the U.S.

As the vocational market place becomes ever more competitive, college education becomes increasingly important. National data sets show that persistence in higher education is important in securing a better quality of life in the U.S. (Day & Newburger, 2002; U.S. Census, 2007). According to the U.S. Census data, as educational level increases so too does the average financial earnings of an individual. The average earnings of U.S. citizens in 2000 ranged from \$18,900 for high school dropouts to \$25,900 for high school graduates, \$45,400 for college graduates and \$99,300 for workers with a professional degree (Day & Newburger, 2002). The U.S. Census Bureau reports that in 2007 the disparities in median earnings for holding only a high school diploma compared to a bachelors degree have continued. Males with a bachelors degree earn approximately \$24,000 more than males with only their high school diploma (U.S. Census Bureau, 2007).

Further, studies at the high school level demonstrate that the old adage that time in the workforce could act as a substitute for higher levels of education can no longer be applied to the current vocational environment. In fact, earnings for early high school leavers have declined by 34.7% since 1971 (Appleton, Christenson & Furlong, 2008). Appleton and colleagues (2008) reported that in 2002 the average annual income levels for males aged 25 to 34 who had left high school early placed a family of five at the poverty threshold. For females in similar circumstances the statistics were worse

(Appleton et al., 2008). Barton (2004) supports this finding, stating that work positions with adequate compensation are becoming less accessible to lower-skilled workers.

Not only does persistence to degree completion in higher education increase the opportunity of achieving better financial security, studies show that it also carries psychological benefits (Kuh et. al, 2007a; Kuh, Kinzie, Cruce, Shoup & Gonyea, 2007b; Pascarella & Terenzini, 1991, 2005). In clear recognition of the new U.S. society that young Americans face in the twenty first century Kuh, Kinzie, Buckley, Bridges and Hayek (2006) note that:

Creating the conditions that foster student success in college has never been more important. As many as four-fifths of high school graduates need some form of postsecondary education to prepare them to live an economically self-sufficient life and to deal with the increasingly complex social, political, and cultural issues they will face. (p. 1)

The above trends show the importance of improving access to higher education. Accordingly, since the 1958 National Defense Education Act, a primary objective of federal higher education policy in the U.S. has been to increase access to higher education for those who would not otherwise attend (Tinto, 2004). Whether by its own merit or because of increasing social pressures this objective is meeting success. This is evidenced by the very high level of growth over the last four decades in the proportion of students pursuing a college education, and the increased diversification of these students' backgrounds (Hussar & Bailey, 2008; Toutkoushian, 2001). Based on enrollment trends from 1992 to 2006 the National Center of Education Statistics (NCES) projects this growth will continue for the perceivable future, with the greatest degree of growth occurring in the number of racial or ethnic minority students seeking a college education (Hussar & Bailey, 2008).

However, finding ways to help matriculating students persist to graduation must also be a concern of administrative bodies. Those students who, once initiated into college, fail to persist with their education potentially endure immediate and longterm financial losses and are also at risk of suffering decreases in their sense of self-worth (Davies & Elias, 2003; Morgan, Flanagan & Kellagan, 2001). Simply increasing access to higher education therefore is not enough to ensure that the greatest number of students are benefitting from attendance and are in a position to pass such benefits on to society. In order for stakeholders to reap the benefits of higher education students must persist with their education until graduation and the quality of that education must be high.

Stakeholder reliance on student persistence combined with the accountability and assessment movements of the 1980's (Ewell, 2002) have led to a proliferation of theories and initiatives that have sought to understand and increase student persistence. However, despite the deeper understanding and the increased use of retention strategies that this work has generated, data collected by the American College Testing program (ACT) over the past twenty years indicates little improvement in national student persistence rates (Habley & McClanahan, 2004). NCES 2008 findings report that six years after beginning a degree roughly (40%) of students had not successfully graduated. ACT (2007) also reported that approximately (50%) of U.S. undergraduates fail to obtain a degree within five years of entering college. Although the ACT data does not account for students who transfer and continue their education at another institution, studies have been conducted that track transfer students and these also report significant levels of non-persistence. For example, Choy (2002) conducted a ten year longitudinal study of student movements in higher education. The findings of this study showed that (20%) of

students previously categorized as failing to complete a degree had re-enrolled at another institution of higher education. Sixty five percent of these had gone on to graduate (Choy, 2002). Even though Choy's (2002) findings indicated that fewer than forty percent of students failed to persist to degree completion, this number still represents huge losses to stakeholders.

Citing the National Center for Public Policy and Higher Education (NCPPE), Kuh and fellow researchers (2006) track non-persistence back to ninth grade. They write, "out of every 100 ninth graders, 68 graduate high school, 40 immediately enter college, 27 are still enrolled their sophomore year, and only 18 complete any type of postsecondary education within 6 years of graduating high school" (p. 1). They also cite Adelman (2006) in noting that these statistics probably underestimate high school graduation as they do not track students who transfer from one school district to another before graduating. However, even if these rates were off by as much as fifteen percent, "far too many students are falling short of their potential" (p. 1).

#### Persistence Beyond the Freshman Year

In the U.S., approximately two thirds of the students who do not persist in higher education leave within the first year of college (Consortium for Student Retention Data Exchange, 1999 cited in Habley & McClanahan, 2004; Tinto, 1993). Given these figures it is understandable that the majority of institutional initiatives aimed at increasing persistence have focused on the freshman cohort of students. From a resource perspective it can certainly be argued that such an approach is reasonable. Tinto (1994) as well as Levitz and Noel (1989) believe that, given the limit to both the human and monetary resources available to

institutions, the most viable solutions to increasing persistence are to be found in institutional efforts focused on the freshmen year. However, in order to fully realize the return on such an investment of resources these freshman initiatives need to provide continued support for students beyond this initial year. Evidence for this need can be found in the continuing high percentage of students who cease their studies in their sophomore year (Habley & McClanahan, 2004; Olcott & Kotovich, 2007) or leave higher education even when close to completion in their senior year (Mohr, Eiche, & Sedlacek, 1998). In fact, Pattengale and Schreiner (2000) suggest that part of the reason for continuing problems may be related to the cessation of the level of support experienced by students in their freshman year.

Yorke and Longden (2004) argue that institutions interested in better serving their student populace and lowering departure rates should focus on restructuring the institution's culture. Rather than seeking to create programs that address why a particular group of students failed to persist, resources would be better spent on factors such as educating faculty in better instructional and advising practices, providing individual students with meaningful ways to connect to the community and faculty, and encouraging students to be committed to their own education (Yorke & Longden, 2004). To be successful these approaches would need to be actively supported at all levels of the institution, from the administration to the classroom. The notion is well supported by others in the field (Astin, 1993a; Tinto, 1990, 1993, 1997 & 2002; Kuh, 2001-2002). In the words of Kuh (2001-2002), "just as no single experience has a profound impact on student development, the introduction of individual programs or policies will not by themselves change a campus culture" (p.30) nor promote longterm student persistence.

The lack of improvement in longterm persistence rates and emerging research that suggests that first year initiatives do not cater to the unique needs of later college cohorts (Graunke and Woosley, 2005; Mohr, Eiche, & Sedlacek, 1998; Olcott & Kotovich, 2007; Pattengale and Schreiner, 2000) are concerning issues that need to be addressed. If considered on the basis of the findings of Yorke and others, efforts to address this issue need to consist of more than the instigation of another program (Astin, 1993a; Kuh, 2001-2002; Tinto, 1990, 1993, 1997 & 2002; Yorke & Longden, 2004). Also, in order to be viable, potential solutions must be sensitive to the current economic reality that institutions of higher education have to operate under increasing budgetary restraints (Tinto, 1994).

#### Engagement as a Way Forward

According to Tinto (1997 & 2002), initiatives need to account more directly for the role of classroom experiences in the process of both student learning and persistence. These findings are supported by the work of Yorke (1999) which identified six categories that students ranked as having moderate to considerable influence on their decision not to persist with higher education. Given in order of influence from highest to lowest these categories were: teaching did not suit me; program organization; inadequate staff support outside timetable; lack of personal support from staff; quality of teaching; and, class sizes too large (Yorke, 1999). Tinto (1990) posits that:

The secret of successful retention programs is no secret at all, but a reaffirmation of some of the important foundations of higher education. There is no great secret to successful retention programs, no mystery that requires unraveling. Though successful retention programming does require some skill and a minimal amount of effort, it does not require sophisticated machinery. It is within the reach of all institutions if they only give serious attention to the character of their educational

mission and the obligation it entails. In short, successful retention is no more than, but certainly no less than, successful education. (p. 47)

The establishment of educational processes that encourage, or indeed require, the active involvement of students in both their own learning and the learning of others (Tinto, 1994) is one classroom focused area gaining attention in the higher education setting. This is driven in part by the body of research that links such practices with desired educational outcomes, including students' persistence with their education (Astin, 1975, 1984, 1993a; Carni, Kuh & Klien, 2006; Kuh et. al., 2007a; Pascarella & Terenzini, 1991, 2005; Pike, Schroeder & Berry, 1997; Tinto, 1993, 1998). Much of this research has at its foundation the early work of Astin (1975, 1984).

Astin (1975) conducted a longitudinal study that endeavored to identify factors in the college environment that had a significant impact on student persistence. The findings indicated that the factors contributing to students remaining in college suggested some form of involvement, whereas those contributing to students not persisting implied a lack of involvement. Astin (1984) used these findings to support his articulation of the idea of involvement in terms of a theory of student development, the focus of which was on the behavioral mechanisms or processes that facilitate student growth and learning. Under this theory involvement referred to: "the amount of physical and psychological energy that the student devotes to the academic experience" (Astin, 1984, p.297).

Although Astin (1984) acknowledged that motivation is an intrinsic component of involvement, he emphasized the critical importance of the behavioral aspects stating: "It is not so much what the individual thinks or feels, but what the individual does, how he or she behaves, that defines and identifies involvement" (p.298). Astin (1984) believed

that the theory of student involvement could be used in an applied manner by college administrators and instructors, helping them design more effective learning environments and improve the quality of higher education.

Kuh (1999) and a design team from the National Center of Higher Education Management Systems (NCHEMS) furthered the discussion of undergraduate institutional reform with their work on student engagement. Student engagement, as a construct, has grown out of sustained research into higher education student learning and development. Pace's (1979, 1982 & 1995) 'quality of effort', Chickering and Gamson's (1987) work to document good practices in undergraduate education, and Astin's (1984, 1993a) theory of involvement form three key antecedents. Also, the work of Pascarella and Terenzini (1991), Tinto (1993), Ewell and Jones (1993, 1996), and Kuh, Schuh and Whitt (1991) contributed to the construct by highlighting the importance of students' integration into the social and academic realms of an institution, outlining the nature and merit of process indicators, and increasing insight into those educationally relevant experiences that fall outside the classroom.

In light of the preceding research, student engagement in the higher education setting has come to refer to the frequency with which students are involved in activities that represent good educational practice and are related to positive learning outcomes. It also incorporates the policies and practices that institutions use to induce students to take part in these activities (Kuh, 2001). Since 2001 the National Survey of Student Engagement (NSSE) has been used as a process indicator designed to measure the construct. The NSSE seeks to gather data from students with regard to "how their college is engaging them and also questions how much they have learned" (Bennett, 2001, p. 44). The results provide

insight into how effectively colleges are contributing to learning in five areas: (a) Level of Academic Challenge (LAC), (b) Active and Collaborative Learning (ACL), (c) Student-Faculty Interaction (SFI), (d) Enriching Educational Experience (EEE), and (e) Supportive Campus Environment (SCE) (NSSE codebook, 2007). By 2006 the self-report survey was being administered annually to over 900,000 first-year and senior students from roughly 1000 institutions.

Research suggests that student engagement is a construct that may represent a practical and critical target for efforts aimed at increasing student persistence. Engagement is, by nature, responsive to areas of the student experience of higher education that are within the realms of institutional influence, such as the classroom (Ahlfeldt, Mehta & Sellnow, 2005; Pascarella & Terenzini, 2005, Tinto, 1997). Also, as the backgrounds of students seeking to attend college become increasingly diverse, engagement has been shown to be a vital element on which to focus. Kuh and colleagues (2007b) reported that, “while engagement in educationally effective practices benefits all students from all racial and ethnic backgrounds, benefitting most in terms of grades and persistence are those who have been historically underserved by postsecondary educational institutions” (p.36). This cluster consists of many of the student demographic groupings that are overrepresented in institutional attrition rates – racial or ethnic minorities, those from low socio-economic backgrounds and first generation students. This effect is supported by other studies as well (Kuh et. al., 2006; Kuh et. al., 2007a). Cruce, Wolniak, Seifert and Pascarella (2006) also showed that the principles of good practice that promote engagement had a compensatory effect on “students who enter college below the average on a particular measure of cognitive ability or orientation to

learning” (p.10). These findings point toward the value of institutions directing efforts towards helping all students increase their levels of engagement.

### Problem Statement

In order to demonstrate the usefulness of the NSSE’s measure of student engagement in capturing the kind of change that promotes longterm student persistence, the effects of engaging students in their first year of study needs to be tracked over a sustained period. If successfully engaging students in their freshman year of study can be shown to have a positive effect on the persistence of these students to their junior year of study, this would indicate that the increased use of those engaging educational practices measured by the NSSE during the first year of college is a viable means of increasing longterm persistence. Research suggests that looking to engagement as a way forward is sensitive to both student differences and the current economic climate faced by institutions of higher education. As Astin (1993a) notes, institutional practices that promote student engagement are achievable within the confines of existing institutional resources.

Using a range of items from the NSSE tool and student high school background characteristics, Kuh and fellow researchers (2007b, 2008) have demonstrated the existence of a correlation between student engagement and the increased likelihood of freshman to sophomore persistence (Hughes & Pace, 2003; Kuh et. al., 2007a; Kuh, et. al., 2007b; Kuh, Cruce, Shoup, Kinzie & Gonyea, 2008). However, little longitudinal research has been done to explore whether higher levels of freshman engagement remain influential in improving the continued persistence of students into the later college years.

Of particular interest, due to the continuing high levels of students who fail to persist at this stage of higher education, is the transition period of the sophomore year to the junior year of study (Habley & McClanahan, 2004; Olcott & Kotovich, 2007).

Research by Kuh et. al., (2006) indicates that a correlation exists between freshman and senior students' scores on the NSSE benchmarks and institutional graduation rates. However, the data in this study was collected at different points in time and represents different groups of students. Also, the authors use institutional averages for the comparison preventing comment on what is occurring at the individual level. Further research is needed that matches an individual student's scores on the NSSE with that student's level of persistence beyond the freshman year. Also, looking at persistence to the junior year provides the opportunity to advance current literature by conceptualizing persistence as constituting a continuum of different levels: non-persistence (leaving in the freshman year); temporary persistence (persisting to the sophomore year but not the junior year), and longterm persistence (persisting to the junior year). This way of looking at persistence allows new contrasts to be made that were not possible in past dichotomous non-persistence/persistence comparisons.

### Purpose

At the institution where this study is situated, data has been gathered over the past three academic years regarding both first-time, full-time student persistence rates and levels of student engagement as measured by the NSSE. No research exists that explores these data sets in relation to one another. Pike and Kuh (2005a) suggest that such internal institutional studies will provide informative data, with a level of relevance that will

encourage faculty members to take greater interest in engagement. Also, as student engagement varies more within institutions than it does between institutions (Pascarella & Terenzini, 2005; Kuh et. al., 2006), a single institutional focus may reveal nuances lost in larger, multiple institution comparisons.

The purpose of this study is to examine the potential role that student engagement, as measured by the NSSE, has on student persistence at a single institution of higher education. A regression analysis is used to make three comparisons: non-persisters versus temporary persisters; temporary persisters versus longterm persisters; and, non-persisters versus longterm persisters. The study uses the NSSE's five benchmarks to consider if differences in student engagement reported at the end of the freshmen year are useful in predicting the likelihood of students persisting to their junior year at an institution. This examination will help the institution to discern if engagement factors are contributing to the longterm retention of their students. It also provides a narrative exploration of the different levels of persistence that exist when looking at longterm persistence. Such knowledge is valuable when considering how best to allocate faculty and monetary resources to improve student persistence, and may also be informative at the instructional level.

#### Research Question

The main question addressed in this study is: Do higher levels of freshman engagement, as measured by the NSSE, increase the likelihood of longterm persistence at a single institution of higher education?

It is necessary to compare a number of different student groups to properly illustrate what is occurring along the continuum of persistence. These groups are: non-persisters, temporary persisters, and longterm persisters. Six research hypotheses are proposed in order to examine each of the possible group comparisons:

H1: Students with higher index scores on the NSSE benchmarks will be more likely to be longterm persisters than non-persisters.

H2: Students with higher index scores on the NSSE benchmarks are more likely to be temporary persisters than non-persisters.

H3: Students with higher index scores on the NSSE benchmarks are more likely to be longterm persisters than temporary persisters.

H4: The significant effects observed in H1 will remain after students' ACT scores, mother's education, father's education, gender and living arrangements are controlled for.

H5: The significant effects observed in H2 will remain after students' ACT scores, mother's education, father's education, gender and living arrangements are controlled for.

H6: The significant effects observed in H3 will remain after students' ACT scores, mother's education, father's education, gender and living arrangements are controlled for.

### Limitations and Delimitations

This study seeks to investigate the NSSE benchmarks, as a measure of student engagement at the end of the freshmen year, in relation to the likelihood of students persisting through to their junior year of study at a Mountain West Research University. The study is deliberately focused on what is occurring at a single institution in order to uncover informative data that can be used to instigate change. The Carnegie

classification system states that the university at which the study takes place is a four-year research university with high research activity. It is primarily residential with very high undergraduate enrollment. Yorke and Longden (2004) make a crucial observation in regards to the level of variance that exists in the U.S. higher education system. They state:

There are in excess of 3700 institutions which accommodate around 60 per cent of 18-year-olds. Institutional provision ranges from small private denominational colleges of fewer than 1000 students to large scale universities with over 50,000 on-campus students. The types of institutions include major research institutions with teaching, large state-sponsored comprehensive universities, highly selective private liberal arts universities, community colleges and the recently developed 'for profit' institutions such as the University of Phoenix. (p. 15)

It is important to note, therefore, that the results of this study may not be able to be generalized to other settings. This is compounded by the predominantly Caucasian character of the population at the institution. However, student retention is a concern in all higher education settings and, as Kuh et. al., (2007a, 2007b) note, engaging educational practices are beneficial to all students at all types of institutions. Thus, with due awareness given to the above caveat, the results of this study may provide useful insights in other settings as well.

In measuring the pre-college academic preparation of participants, this study has only limited access to material. This means that proxy measures form the main source of data for this variable. The necessity, for reasons of validity, of administering the NSSE at the end of the year also means that students leaving before this time are arbitrarily excluded from the study.

Finally, student persistence is narrowly defined within study. The term is usually used to refer to a student's perseverance with study until educational goals have been

attained or degree completion is achieved, regardless of their enrollment status at their original institution. However, due to an inability to track participants across institutions and the interest in focusing on engagement within a single institution, this study uses the term in reference only to those students who persevere at the institution at which the study takes place. This means that, as Choy (2002) demonstrated, some students may be improperly categorized as failing to persist when in fact they had re-enrolled at another institution.

It should be noted, that for the purpose of this study, persistence and retention are still considered to be distinct from one another. Retention focuses on the efforts by an institution to keep its students enrolled, whilst persistence includes the effort the individual makes towards their educational goal. As this study is interested in measuring, at an individual student level, the role of the construct of engagement in continued enrollment (which itself represents the interplay of efforts by both the institution and the individual student) it is felt that term student persistence remains appropriate and distinct.

### Significance of the Study

Finding methods of increasing student persistence rates that have a lasting effect, but that do not constitute a vast expense to institutions, is vital if various stakeholders are to reap the benefits of higher education. Student engagement is an emerging construct that has the potential to offer workable, efficient solutions that may help with this issue. Studies indicate that successfully engaging students in educationally purposeful activities can have a positive impact on freshmen to sophomore persistence (Hughes & Pace, 2003, Kuh et. al., 2007a; Kuh et. al., 2007b; Kuh et. al., 2008). However, knowledge is limited

with regard to whether the positive impact of freshman engagement on persistence continues into the later years of college. Also, little work has been done at the institution at which this study is situated that examines student responses on the NSSE in relation to their persistence with their educational pursuits.

This study contributes to existing literature on persistence and engagement. It provides new information on whether increasing student engagement in the freshman year has lasting effects on persistence in later years of college. Specifically, by exploring both the temporary and longterm persistence of students the study adds to the current, insufficient body of literature that exists regarding persistence in the sophomore year and into the junior year. Further, by studying the role of this important aspect of the student experience this study will provide the institution at which the investigation occurs with valuable data regarding its actual student populace.

### Assumptions

This research rests primarily on the tool developed and employed by the NSSE. This tool makes use of student self-reported data to measure levels of engagement. Kuh (2004) reflects that this is a common research practice when assessing the quality of undergraduate education. He goes on to argue that “[f]or many indicators of educational practice, such as how students use their time, student reports are often the only meaningful source of data” (p.3). The credibility of self-reports as a means of valid data collection has undergone substantial investigation (Baird, 1976; Lowman & Williams, 1987; Pace, 1985; Pike 1995; Pohlman & Beggs, 1974; Turner & Martin, 1984). Hu and

Kuh (2002) and Kuh (2004) state that these investigations indicate that in higher education self-reported data is likely to be valid under five general conditions:

1. The information requested is known to the respondents,
2. The questions are phrased clearly and unambiguously (Laing, Sawyer, & Noble, 1988),
3. The questions refer to recent activities (Converse & Presser, 1989),
4. The respondents think the questions merit a serious and thoughtful response (Pace, 1985), and
5. Answering the questions does not threaten, embarrass, or violate the privacy of the respondent or encourage the respondent to respond in socially desirable ways (Bradburn & Sudman, 1988, cited in Hu & Kuh, 2002, p. 557).

Kuh (2004), states that the NSSE tool was “intentionally designed to satisfy all these conditions” (p.4). Most items on the report were adapted from established and validated instruments including the College Student Experience Questionnaire (CSEQ), the Cooperative Institutional Research Program (CIRP) freshman survey, and surveys used by the University of North Carolina (Ouimet, Carini, Kuh & Bunnage, 2001). The tool was extensively field tested in 1999 using a sample of approximately 36000 students from 68 four-year colleges (Ouimet et. al., 2001). To further establish the validity and reliability of the NSSE, psychometric analyses have been conducted with steadily growing sample sizes of both students and institutions each year since its initial administration (Kuh, 2004). To strengthen the results of psychometric testing a large scale focus group study was also undertaken that demonstrated that participants interpreted the questions and time references such as “occasionally” in a satisfactorily

similar manner (Ouimet et. al., 2001). Finally, validity and reliability have also been established for different types of students and institutions. Kuh and associates (2007b) confirm that “the NSSE survey works equally well for students from different racial and ethnic backgrounds attending different types of institutions” (p.2).

This study operates under the assumption that the above research, conducted to establish the reliability and validity of the NSSE, was undertaken with integrity and is of professional quality. Also assumed is that the spring 2007 administration of the survey at the participating institution did not have any significant impact on respondents’ self-reports and that non-respondents did not significantly differ from respondents. Of equal importance is the supposition that the institution’s tracking of student enrollment status is accurate. Finally, the findings of this work are reported under the belief that human error in the analysis of the data did not occur.

## CHAPTER TWO

### REVIEW OF THE LITERATURE

The constructs of persistence and engagement, which form the focus of this study, have emerged in higher education alongside developments in the broader education sector of U.S. society. Originating in cries for reform at the pre-college levels of schooling, many of these developments have since influenced the field of higher education. A major influence in the emergence of persistence and engagement as topics of interest is the culture of accountability that has taken hold within U.S. education. Stemming from funding issues that came to a head in the 1980's and a fear of becoming uncompetitive on the international scene, calls for accountability for student and institutional performance have been at the heart of much of the discussion around higher education, and education more generally, over the last three decades (Association of American Colleges and Universities, 1985, 2002, 2004; Boyer, 1987; Burke, 2004 & 2006; Education Commission of the States, 1995; Ewell & Jones, 1991; The Middle States Commission on Higher Education, 2002).

In 1991 Chickering and Gamson opined that, "dramatic changes in social conditions and economic requirements make effective post-secondary education a critical requirement for effective citizenship, productive work, and global competitiveness" (p.1). Sewell (1996) believes the public reporting of the 1983 "A Nation at Risk" report galvanized thoughtful citizens to question the effectiveness of current educational structures. The article claimed that the "educational foundations of our [U.S.] society are presently being eroded by a rising tide of mediocrity that threatens our very future as a

Nation and a people” (The National Commission on Excellence in Education, 1983, p.113). Although the accuracy of the picture painted by the report has been the center of much debate, questions about the effectiveness of U.S. higher education have persisted. Kuh and Vesper (1997) state that “[g]overnors, legislators, regional accreditation associations, and other external stakeholders (e.g., employers, parents) are [still] demanding better information about student and institutional performance” (p.43-44). In 2004 the board of directors of the Association of American Colleges and Universities (AAC&U) declared that:

In the current climate it is not enough for an institution to assess its students in ways that are grounded in the curriculum; colleges and universities also must provide useful knowledge to the public about goals, standards, accountability practices, and the quality of student learning. (AAC&U, 2004, p.9)

Largely based on the perceptions of various groups of stakeholders, the decades of the 1980’s and 1990’s saw the emergence of a presumption that the quality of undergraduate education was declining (Kuh, 1999). Using results from similarly worded items in survey research from the decades of the sixties through to the nineties, Kuh (1999) set out to investigate whether this presumption was justifiable. The findings of the study were constrained by several limitations, including:

Whether the responses of students across decades have the same meaning... Perhaps the increase in proportions of students reporting substantial gains [in writing, for example], is artificially inflated due to floor effects... “substantial progress” in the minds of today's students may be comparable to what students of a decade or two ago might have considered little progress. (Kuh, 1999, p.111)

Nevertheless Kuh (1999) concluded that the study pointed to the justification of the perceived need for educational reform. Amongst his findings were that proportions of students reporting substantial progress in general education over the decades had

decreased, and that the student cohort of the 1990's "devoted less effort to activities related to learning and personal development" (p.112) than did their counterparts in previous decades.

In response to the increasing pressure to demonstrate the effectiveness of the U.S. education system, leaders both within and outside of institutions of higher education entered into ongoing deliberations centered on the concept of quality, its meaning, and measurement. The Education Commission of the States (1995) notes that responses have tended to cluster around two distinct themes. Driven primarily by those outside of the higher education institutions, one theme concerned the abilities and attributes of college graduates, or the outcomes of higher education. Stakeholders subscribing to this theme wanted to know such outcome measures as: the length of time to successful degree completion; the intellectual gains of graduating students; and, graduates' success after college, including success with future education and employment (ECS, 1995). This focus on college outcomes guided much of early institutional reform efforts.

The second theme centered on an examination of the collegiate experience. Advocates of this theme argued that equally important to the understanding of quality were measures of the educational good practices occurring at institutions of higher education (ECS, 1995). In their landmark publication, Chickering and Gamson (1987) identified seven categories of effective educational practices that directly influence student learning and the quality of their educational experiences. These were student-faculty contact, cooperation among students, active learning, prompt feedback, time on task, high expectations, and respect for diverse talents and ways of learning. Generally speaking, the more students engage in these kinds of activities, the more they learn and

the more likely they are to persist and graduate from college (Kuh et. al. 2006). Ewell (2002) considers that this second theme was spurred on by the assessment movement that arose in the mid 1980's. Tied to the rising demand for accountability, this movement had at its center three main recommendations that were strongly informed by research in the student learning tradition. These recommendations stated that, "higher levels of student achievement could be promoted by establishing high expectations for students, by involving them in active learning environments, and by providing them with prompt and useful feedback" (Ewell, 2002, p.5).

A result of the discussions about educational quality has been a proliferation of outcomes measurements for those served by the higher education system (Kuh & Vesper, 1997). The Higher Education Panel, a survey research department within the American Council on Education, reported that almost all (94 percent) of the 407 institutions that took part in the 1995 Campus Trends survey had implemented assessments of outcome measures of student learning based on techniques developed primarily in the 1980's. This represented a 39 percent increase since 1988 (El-Khawas, 1995).

Another result has been that many states are looking for ways to become involved in the outcomes of higher education within their borders. "Quality is the byword, as states recognize that a strong system of higher education is as vital to a state's well-being and growth as strong primary and secondary schools" (Rising Expectations, 1985, p.13 cited in Garland, 1990, p.3).

At the governmental level, much of the interest in outcome measures has been guided by the economic theory of Human Capital, as linked to education by Becker in 1975 (Becker, 1975; Paulsen, 2001; Yorke & Longden, 2004). Yorke and Longden

(2004) submit that the basic premise behind the theory can be summarized as governments considering their nation's economic success as resting on the degree to which the labor force is educated. Thus, federal higher education policy has sought through various incentive programs to increase access to higher education for a wider range of the U.S. population.

A second, and competing, reason for increased government interest in outcome measures is the reality that as more students enter higher education a greater demand is placed on public funding (Huisman, Kaiser & Vossensteyn, 2000, cited in Longden, 2002). Using the 1998 funds and enrollment data from the Digest of Educational Statistics, Toutkoushian (2001) demonstrated that in the U.S. there has been a very high level of growth over the last four decades in the number of students pursuing a college education. One result of this is that the sustainability of the education system has come to be perceived as resting on a profitable return on investments (ECS, 1995). Such a perception can be witnessed in the growth of concern for effective educational funding and the development of formula concepts (Burke, 2002; Burke & Minassians, 2003; Edirisooriya & Sevier, 2001; Garland, 1990; Hashway & Cain, 1993; Jenny & Arbak, 2004; Kacmarczyk, 1984; Toft, 1975; Wagner, 1996). In this context efficiency becomes a foundation that must be established, inseparable from other concerns of institutional quality. Longden (2002) suggests that “‘Wastage’ in any system becomes a focus of interest when efficiency gains are required” (p.17).

### Student Persistence Rates as a Measure of Quality

In the case of education a major form of inefficiency or wastage is student attrition and non-persistence. Yorke and Longden (2004) note that “the early withdrawal of students in effect ‘wastes’ the resources that were committed to recruiting and enrolling them” (p. 9). Further resources are dissipated by the loss of future tuition and fees, loss of faculty lines, and the resultant increased recruitment costs (Habley & McClabahan, 2004). The State Higher Education Executive Officers’ (SHEEO) 2008 report indicates that tuition and fees can represent over (52%) of the State appropriations for public institutions. Considering this, improving retention rates may be more a matter of institutional survival than simple academic interest.

Solving the issues relating to persistence can be cast in a social justice light as well as a purely economic one. Yorke and Longden (2004) and Bourner, Reynolds, Hamed and Barnett (1991) warn that a possible consequence of the public reporting of institutional retention rates may be that an institution concerned with improving its performance may look only to enroll those students whose backgrounds point more strongly to success. Enrollment trends like this would effectively lead to wastage in large portions of U.S. society as the groups deemed less likely to succeed would be denied the opportunity to actualize their potential. If such were to occur the character of U.S. higher education as a source of upwards mobility would be in jeopardy and the positive expansion of those attending higher education would be undermined.

Reviews by Summerskill (1962) and Pantage and Creedon (1978) show the longevity of interest in the “departure puzzle” (Braxton, 2000, cited in Yorke and

Longden, 2004, p.75). Annual reporting over the last twenty years by organizations such as Noel-Levitz, NCES and ACT on institutional retention and attrition in the U.S. demonstrates that interest in the phenomenon is not waning. Such a degree of interest is understandable as the majority of investments made by the various stakeholders into the process of post-secondary education can only be fully realized by a student persisting at an institution until graduation (Day & Newburger, 2002; Kuh et. al., 2006; Kuh et. al., 2007a; Pascarella & Terenzini, 1991, 2005; U.S. Census, 2004; Yorke & Longden, 2004).

The identification of student persistence as important to both internal and external stakeholders has led to a shift in focus. Initially theoretical work helped to identify factors that impeded students from succeeding in college and reaching desired outcomes. Through the 1980's and early 1990's further research was conducted and resources were committed in an attempt to lessen the impact of these factors. By the late 1990's, with national attrition rates failing to show improvement and increasing demands for more informative assessments of quality, discussions of educational quality began to focus on the processes that enable students to succeed. This shift from looking at what caused students to leave towards what helped students to persist has led stakeholders to look more critically at institutional culture. It has also been instrumental in the creation of process measures to monitor student and institutional progression towards desired educational outcomes. The theories of student departure that initiated the process have in turn been revisited, and the insights they provide have been adapted.

### Persistence Theories

Theories regarding student persistence have been informed by the disciplines of sociology and psychology; though by no means “can it be convincingly argued that the theoretical formulations that have been produced are monodisciplinary in character” (Yorke & Longden, 2004, p.76). Kuh and fellow researchers (2006) suggest that cultural, economic and organizational perspectives also contribute to understanding the phenomenon. Perhaps the three most recognized contributions to the field come from the works of Bean, Tinto, and Astin. Bean (1980, 1981, 1982) and later Bean and Eaton (2000, 2001) drew attention to the individual’s experiences of psychological change during college, and how these impact on decisions to persist or withdraw. Tinto (1975, 1987, 1993) developed a principally sociological model of student departure that sought to explain the processes of interactions between the individual and the institution that led differing individuals not to persist with higher education. Astin’s work with the concept of involvement focused on the importance of the energy students put into the college experience (Astin, 1984 & 1993a).

Beginning with his work in 1980, Bean argued that non-persistence at an institution of higher education can be understood by an application of a model of turnover in work organizations to the persistence process. He used this model “in conjunction with the Fishbein/Ajzen models of behavior, which incorporate intentions in the causal sequence” (Bean, 1982, p.292). Bean suggested that:

The background characteristics of students must be taken into account in order to understand their interactions within the environment of the university...The student interacts with the institution, perceiving objective measures, such as grade point average or belonging to campus organizations, as well as subjective

measures, such as the practical value of the education and the quality of the institution. These variables are in turn expected to influence the degree to which the student is satisfied with their chosen institution. The level of satisfaction is expected to increase the level of institutional commitment. Institutional commitment is seen as leading to the degree in the likelihood that a student will persist in school. (Bean, 1980, pp.158-160)

Bean did not separate students who were forced, due to dismissal, to leave higher education from those who failed to persist for other reasons. The distinction was not made primarily because, as set out in the Notes section of Bean (1981), the author did not have access to such information from student records. Further, Bean suggests that both groups of non-persisters should be included as those dismissed from higher education represented failures of the socialization process rather than the presence of mental deficiency, and excluding such students would arbitrarily exclude extremely low values of the variable grades (Bean, 1981). This notion is not widely supported by others theorizing in the field around the same time (Pascarella, 1980; Price, 1977; Tinto, 1975).

Bean's (1981, 1982) work pointed to the importance of the internal psychological traits and self-beliefs of individuals when examining persistence. It also highlighted that a student's intent to leave, negatively associated with institutional loyalty and valuing of higher education, was the most powerful predictor of departure. Later work by Bean and Eaton (2000) furthered these notions, proposing that personality traits such as self-efficacy help a student persevere when faced with academic and social challenges. Students with less well developed self-concepts are less confident in their abilities and would therefore be more likely to give up when faced with adversity.

Bean and Eaton (2000) fuse four psychological theories into a heuristic model: attitude-behavior theory, coping behavior theory (approach-avoidance), self-efficacy, and

attribution theory. They suggest that if interactions with differing aspects of the institution promote change which the individual considers positive, then the student will experience increases to his or her sense of self-efficacy, reduced stress, increased confidence and a greater sense of control. These factors, in turn, increase the likelihood that the student will persist with his or her education (Bean & Eaton, 2000). If, however, these interactions promote change which the individual feels is negative or irreconcilable with who they are, the student will be at risk of not persisting.

In their later work examining the psychological components of four popular retention programs, Bean and Eaton (2001) looked into how academic and social integration are impacted through psychological outcomes in different programs. According to the authors the factors affecting the retention and persistence of students are ultimately individual; it is individual psychological processes that form the foundation for decisions about persistence (Bean & Eaton, 2001). However, they believe that, given an understanding of the psychological processes involved in a student achieving academic and social integration, an institution could create programs and environments that increase integration and consequently increase student success (Bean & Eaton, 2001).

Bean and Eaton's (2000) work was in response to what they considered to be a reliance of researchers on sociological theories to explain why students failed to persist, and lack of attention being given to psychological contributions. However, although their work offers a principally psychological framework for student persistence, the concept of social and academic integration in relation to higher education has sociological roots.

Tinto (1975, 1987, 1993) advanced the earlier work of Spady (1970), furthering understandings of student persistence with his theory that was based on Durkheim's

(1951) suicide model and later incorporated van Gennep's (1908) 'rites of passage'. Of all the theoretical models posited, "Tinto's interactionist theory of college student departure has near-paradigmatic stature" (Braxton, Bray & Berger, 2000, p.215). Tinto's work, in part, grew out of the recognition that there existed a lack of distinction between the varying forms of student departure from higher education. Using the earlier construct of "dropout" to refer to students who fail to persist with education, Tinto (1975) comments that "it is not uncommon to find, for instance, research on dropouts that fails to distinguish dropout resulting from academic failure from that which is the outcome of voluntary withdrawal" (p.89). Contrary to Bean (1981) Tinto (1975) believed that academic dismissal and non-persistence due to other reasons comprised separate phenomenon, demanding different methodologies. Tinto (1975) also considered that there was a failure, in the research practices of the time, to look more holistically at the phenomenon of persistence. He felt that exploring single demographic characteristics in relation to non-persistence failed to provide valuable information upon which to develop preventative measures (Tinto, 1975).

Tinto's theory positioned the decision to persist within a process of interactions between the individual and the institution. According to Tinto's theory, the inability to separate from pre-college life, effectively deal with transitional periods, and accept and adopt new values at college leads to students being unable to commit to college life and therefore being more likely not to persist with their education (Bean & Eaton, 2001). The theory situates the students' experiences of college within the domain of relationships. From Tinto's perspective these relationships are not equal. The student's relative powerlessness to change the institution places much of the emphasis of responsibility for

non-persistence on the institution due to its failure to make the appropriate accommodations.

Tinto (1975) puts forward for consideration a conceptualization of the decision to persist or not persist with higher education as stemming from three key areas. The first of these is the student's entering background characteristics (Tinto, 1975). Here two characteristics of the individual are central to persistence: the student's educational intentions, and their institutional commitments (Tinto, 1993). These two characteristics can determine the degree to which an individual is willing to ignore the differences between personal expectations and the institutional environment. Tinto (1993) wrote that "these not only help set the boundaries of individual attainment but also serve to color the character of individual experience within the institution following entry" (p.37). The student's intention refers to primary goals for being in higher education, including the goal of graduation. The higher the educational goal the more likely it is that the student will persist (Tinto, 1975). The individual's commitment to higher education will also increase the probability of persistence, while commitment to a particular institution will decrease the probability of attrition from that institution (Tinto, 1987). In this sense the student's commitment is a measure of motivation to complete a degree and loyalty to the institution at which he or she is enrolled.

The second key area is comprised of the forces external to both the institution and the individual student. Tinto (1975) recognized that these forces could be influential in determining whether a student would persist with higher education to degree attainment. He suggested that a cost-benefit style analysis takes place for students attempting to balance competing obligations and multiple roles, such as work and family (Tinto, 1975).

If the external obligations win out in such an analysis the obvious outcome is non-persistence. Tinto (1993) considers that students of non-residential institutions are more susceptible to these external forces, explaining that the weaker social and academic systems present may be unable to sufficiently support students' educational interests. Yorke and Longden (2004) and Choy (2002) see this as an increasing problem for U.S. higher education in general as, in response to the growing need to self-finance post secondary education, students are commonly interspersing periods of study with employment.

The third area is the degree to which a student can be successfully integrated into the academic and social systems of college (Tinto, 1975, 1987 & 1993). This notion of integration has become a key component in much of the research into persistence regardless of the disciplinary lens (Braxton, Sullivan and Johnson, 1997). It has also formed a primary focus for institutions seeking to improve persistence because it is the area most targetable by institutional initiatives and, according to Tinto's theory, can help students overcome obstacles to persistence in the other two areas of influence outlined above.

Tinto (1975) suggests that an individual's academic integration "can be measured in terms of both his grade performance and his intellectual development during the college years" (p. 104). He termed these two forms of academic integration as structural and normative respectively. Social integration refers to the level of congruency that exists between the individual student and the social systems, both peer and faculty, present at an institution and the level to which such congruency can be facilitated to create meaningful relationships (Tinto, 1975). Tinto (1975) concluded that "given

individual characteristics, prior experiences, and commitments, it is the individual's integration into the academic and social systems of the college that most directly relates to his continuance in that college" (p. 96).

As a part of the process of social and academic integration, Tinto (1993) identified four experiences that influence if a student will be successful in persisting with their education or if they will fail to persist. He labels these experiences: adjustment, difficulty, incongruence, and isolation.

The first experience, adjustment, describes the transition the student makes from the familiar social networks of family and friends to the new environment of college. In order to be successful in this new environment a student needs to be able to adjust to new social and intellectual demands (Tinto, 1992). The stronger a student's intentions, commitments and level of resiliency the higher the likelihood that this transition will be successfully made. However, for some, this initial need to adjust can prove insurmountable leading to these students failing to persist with their educational pursuits.

Tinto's (1993) concept of difficulty comprises the second experience. Here the toll required to meet the academic standards of higher education can prove too much for some students. This experience does not only apply to disadvantaged or minority students, difficulty can be experienced by all students. In 2000, for example, 48 percent and 35 percent of high school seniors scored at the basic and below basic levels, respectively, on the National Assessment of Educational Progress (Kuh et. al., 2006). High achieving student can be affected as well, with the effort required to maintain their grades burning these students out. Tinto (1993) considers a central reason for non-persistence due to difficulty stems from a deficiency in pre-college preparation. Low

levels of expectations being placed on students by their high school teachers, inconsistent grading and a growing trend of individual unpreparedness constitute much of this deficiency. Tinto (1993) believes that the quality of high school preparation is not keeping pace with the interest in attending college.

Tinto (1987) describes the experience of incongruence as feeling substantially at odds with an institution. It consists of a general lack of fit between an institution's culture and the needs, interests, and preferences of the individual (Tinto, 1993). Incongruence can manifest itself in a student feeling overly challenged by their coursework or conversely finding the coursework not challenging enough. It can also appear when a student perceives that his or her values and interests do not match those of other students or those upheld by the institution. In both scenarios the student may not persist at the institution. In order to address the issue of incongruence, colleges need to present a clear picture of their institutional climate to prospective students (Tinto, 1993). This is especially true for those who have less knowledge of what to expect, such as first-generation students.

Finally, students who cannot establish themselves as a part of a social network, fail to develop the "personal bonds that are the basis for membership in the communities of the institution" (Tinto, 1993, p. 56) and thus, may experience feelings of isolation. Whilst incongruence captures the occurrence of a mismatch of values in the interaction between the institution and the student, isolation refers to the state where insufficient interactions are occurring (Tinto, 1987). If not addressed in some way, these feelings can lead to early withdrawal from an institution. Tinto (1993) considered that the

relationships between the student and peers, faculty and other members of the institution are all critical in overcoming feelings of isolation.

In a cyclical process, a student's initial educational intentions and commitments affect their level of integration which in turn affects the student's future intentions and level of commitment (Braxton, 2000). Tinto stated:

The more students are involved academically and socially, the more likely are they to become more involved in their own learning and invest time and energy to learn. Involvement, especially academic involvement, seems to generate heightened student effort. That effort, in turn, leads to enhanced learning. . . Other things being equal, the more students learn, the more likely are they to persist. (Tinto, 1993, p.131)

The importance of involvement as an educational concept owes much to the work of Astin (1984, 1993a). Pascarella and Terenzini (1991) consider that Astin's theory of involvement "occupies something of a middle ground between psychological and sociological explanations" (p.50). In describing the concept, Astin (1984) compares it to the Freudian notion of cathexis that depicts people investing psychological energy in objects and persons outside of themselves. He also considers that it contains aspects of what learning theorists traditionally refer to as time-on-task and motivation. Astin (1984) states that, "the theory of student involvement argues that a particular curriculum, to achieve the effects intended, must elicit sufficient student effort and investment of energy to bring about the desired learning and development. Simply exposing the student to a particular set of courses may or may not work" (p.300). The theory has its roots in a longitudinal study of college non-persisters (Astin, 1975) that "endeavored to identify factors in the college environment that significantly affect the student's persistence in college" (Astin, 1984, p.302).

Astin (1984) suggests that an involved student is someone who devotes considerable time and energy to his or her studies, spends a good deal of time on campus, participates in campus activities, and regularly interacts with other students and faculty members (Astin, 1984). Important to the concept is the recognition that it is both the quality and the quantity of a student's involvement that will influence the degree to which positive educational outcomes are experienced (Astin, 1984 & 1993a). Five postulates form the foundation of the theory of involvement:

1. Involvement refers to the investment of physical and psychological energy in various objects. The objects may be highly generalized (the student experience) or highly specific (preparing for a chemistry examination).
2. Regardless of its object, involvement occurs along a continuum; that is, different students manifest different degrees of involvement in a given object, and the same student manifests different degrees of involvement in different objects at different times.
3. Involvement has both quantitative and qualitative features. The extent of a student's involvement in academic work, for instance, can be measured quantitatively (how many hours the student spends studying) and qualitatively (whether the student reviews and comprehends reading assignments or simply stares at the textbook and daydreams).
4. The amount of student learning and personal development associated with any educational program is directly proportional to the quality and quantity of student involvement in that program.

5. The effectiveness of any educational policy or practice is directly related to the capacity of that policy or practice to increase student involvement. (Astin, 1984, p. 298)

According to the theory providing opportunities for students to immerse themselves in campus life, such as living in a residence hall, prompts the student to put more energy and effort into the college experience. This represents an increase in the student's level of involvement in college. Increase in involvement in turn leads to increases in learning and a reduction in the probability of non-persistence (Astin, 1984).

Astin (1993a) himself offered substantiated evidence for his theory of student involvement through the results of a longitudinal study of student non-persistence with college. Using a large national data set collected by University of California, Los Angeles (UCLA), Astin investigated the link between educational outcomes and the variables of academic involvement, involvement with faculty, involvement with student peers, and involvement in work. The findings from this study imply that higher levels of involvement in these variables increase the likelihood of student persistence (Astin, 1993a).

The above theories underscore three interrelated elements that have become central in studies of student persistence: satisfaction, integration, and involvement (Pascarella & Terenzini, 1991). They are by no means an exhaustive list of the important theoretical work undertaken with regard to student persistence, but together they demonstrate the major lines of thinking about the construct. Others have contributed refinements and nuances. Notably, Pace's (1979, 1982, 1995) work with the concept of 'quality of effort' followed a similar path to the work of Astin (1984, 1993a). Pace demonstrated the importance of reviewing

both sides (the student and the institution) when examining phenomena such as non-persistence. The evidence from his work pointed to the fact that “college can’t give you an education; but if you go to college, and fully use the facilities and opportunities it provides, you can get an education – indeed, a very good one” (Pace, 1982, p. 38).

In their synopsis of literature regarding how college affects students, Pascarella and Terenzini (1991) note the important contributions made by Pascarella (1985) and Weidman (1989). Although these two authors did not develop their theories specifically to explain student persistence, they have nevertheless furthered understandings in that area. According to Pascarella and Terenzini (1991), Pascarella’s 1985 theory emphasizes the need to devote more attention to “the nature or strength of the influences of an institution’s structural/organizational characteristics [and] the role of individual student effort” (p. 53). Weidman’s theory adds value in the attention it brings “to non-cognitive changes, such as those involving career choices, life-style preferences, values, and aspirations” (Pascarella & Terenzini, 1991, p. 55) and to the continuing influence on students of pre-existing social networks such as parents, employers and friends (Pascarella & Terenzini, 1991).

Yorke and Longden (2004) consider that Bourdieu’s (1973) concept of cultural capital demonstrates that institutions of higher education discriminate, at least implicitly, against students attempting to transition into higher education who are not from the dominant culture. Briefly, cultural capital suggests that students bring to higher education sets of assets derived from their native culture. The closer these align to meeting the requirements and culture of the institution of higher education the student attends, the higher the individual’s cultural capital is, and the easier it will be for them to integrate into the social and academic systems of that institution (Bourdieu, 1973 cited in Yorke & Longden,

2004). Cultural capital demonstrates that institutional efforts to reduce student non-persistence need to work equally well for those whom Kuh and colleagues (2007b) call the historically underserved as they do for those from the dominant culture.

### Contemporary Views of Student Persistence

Since their conceptualization the above theories have generated a large body of research. Such efforts have led to a continuing evolution in the theoretical framework underlying student persistence. A contemporary view of student persistence does not see the above theories as mutually exclusive, rather they are most often perceived as complementing one another. When used together the works offer a more complete understanding of the complex interplay among individual, environmental, and institutional factors involved in student persistence (Braxton, 2000; Cabrera, Casteñeda, Nora & Hengstler, 1992; Cabrera, Nora & Casteñeda, 1993; Pascarella & Terenzini, 1991 & 2005).

Empirical testing of Tinto's (1975, 1993) model of student departure, for example, has provided evidence that the model can benefit from refinement and the addition of constructs from other theoretical perspectives (Cabrera, Castaneda, Nora & Hengstler 1992; Towles & Spencer 1993; Braxton, Sullivan & Johnson 1997; Berger & Braxton 1998; Berger & Millem 1999; Elkins, Braxton & James 2000; Tierney, 1992 & 2000). Although they considered that Tinto's theory possessed logical internal consistency, upon examining the thirteen propositions it yields Braxton, Sullivan and Johnson (1997) found support for only five. Towles and Spencer (1993), in assessing the ability of Tinto's model to inform retention strategies for non-traditional students, found that the model was not adequate enough to guide policy making decisions. From his anthropological position, Tierney (1992

& 2000) advances further criticisms stating that Tinto's theory incorrectly uses van Genep's 'rites of passage', an intra-cultural phenomenon, in an inter-cultural context. Tierney (2000) opines that models based on assimilation or acculturation leave many questions unanswered, especially with regard to multiple group identifications and how both minority and majority groups change when they come in contact with one another.

Findings common in numerous research papers identify four broad categories into which reasons for non-persistence fall. These four categories are: academic, personal, financial and social (Brawer, 1996; Mohr, Eiche & Sedlacek, 1998; Li & Killian, 1999; Choy, 2002; York & Longden, 2004; Baxter, 2004; Harrison, 2006). Brawer's (1996) review of literature captures some of the post-enrollment factors within these categories that contribute to an increased risk of early departure: part-time study, full-time employment, low grade-point average, being a member of an ethnic minority other than Asian, family obligations, and financial struggles. Other studies have examined the importance of pre-college factors that may increase students' struggles in these categories.

A student's level of pre-college academic preparation is influenced by family background factors including parent's level of education and family SES. The quality of this preparation strongly impacts a student's chances of college success including the likelihood of enrollment and persistence, and college GPA (Kuh et. al., 2006). McCarthy and Kuh (2006) and Kuh (2007) point out that below grade level proficiency in mathematics and reading during high school significantly decreases a student's chances of success at college. Cambiano, Denny and DeVore (2000) used high school GPA, ACT scores, gender, and age as variables to study student retention. In this study ACT scores were found to be important

predictors of persistence each semester (Cambiano et. al., 2000). Gender was only found to be a significant predictor in the ninth semester of study (Cambiano et. al., 2000).

Kuh and fellow researchers (2007a & 2007b), in studying the effects of engagement on persistence, note that females are more likely to persist at the same institution to their second year of study than males. Smith (1992), in a longitudinal study across multiple institutions, found that in almost all of the institutions retention and graduation rates were higher for females than they were for males. In a six-year study at a single institution, Johnson (1997) found that for commuter students the impact of gender on persistence was reversed with females being more likely to leave the institution than males. Kuh and colleagues (2006) consider that gender differences in college participation and completion are more pronounced when examined in conjunction with other factors, such as socioeconomic status and parental education.

According to Pascarella and Terenzini (2005) “students whose parents held a bachelor’s degree or higher were five times more likely to earn a bachelor’s degree than were similar first-generation students” (p.590). Research by Warburton, Bugain and Nuñez (2001) supports this statement. Parents level of college experience impacts on a student’s level of pre-college preparation and college expectations, both of which are related to the student’s likelihood of success at college (Kuh et. al., 2006). First-generation students are also more likely to come from low income families, and less likely to live on campus during the first year of college (Pike & Kuh, 2005b; Terenzini et., al., 1996). These conditions create potential barriers to their success at college.

Astin (1993a) found that students’ socioeconomic status was the best predictor of earning a bachelor’s degree after controlling for academic ability. Using a range of

explanatory variables including gender, family income, and mother's level of education, Ishitani and DesJardins (2002) also indicate that students from lower income families are more likely not to persist with college. Interestingly, these researchers found that being from a low income family was even more detrimental in the second and third years of school. Having a mother who was a college graduate decreased the likelihood that a student would leave college (Ishitani & DesJardins, 2002). Additionally, being a college student from a low income family raises the probability of having to work whilst attending school. Working more than fifteen hours a week can be potentially detrimental to persistence (Choy, 1999).

Pascarella and Terenzini (1991) offer an expanded version of the four categories that is focused on post-enrollment factors. They identify the following areas as important to persistence: academic achievement (grades), peer relationships and extracurricular involvement, interactions with faculty, academic major, residence, orientation and advising, and financial aid and work. Reviewing Titus's (2004) work, which utilized Bean's model of attrition with institution-level constructs from Berger's and Milem's (2000) college impact model, Kuh and fellow researchers (2006) conclude that college student persistence is influenced by complex factors, most of which are student-level factors such as gender, socioeconomic status, enrollment patterns, and engagement levels.

Caution needs to be taken when considering indicators individually as their effects on student success tend to be clearer when examined in combination with one another. Also, their importance in the departure puzzle varies from one setting to the next and indeed from one student to the next. Tinto (1998) points to, for example, social and academic indicators having differing effects on different types of students attending differing types of

institutions. Conceivably the problem is, as Tinto (1975) and Yorke and Longden (2004) comment, that looking at factors that contribute to attrition risks mistaking symptom for cause. There exists a need to look at the phenomenon of persistence holistically. It is not hard to conceive how the four recurrent categories mentioned above could comprise of a complex interplay of social and psychological components unique to the individual. Also, it is not difficult to envisage how understanding such interplay has to involve an acknowledging of the roles played by both the institution and the student.

Trying to develop a program that will address this plethora of individual needs is problematic. Nevertheless, institutions of higher education have implemented numerous changes in response to research findings in an attempt to reduce the level of student non-persistence (Noel-Levitz, 2007; Habley & McClanahan, 2004). These have had mixed success with the overall change in non-persistence rates in the U.S. varying little over the last few decades (ACT, 2007; Habley & McClanahan, 2004). Those initiatives that have consistently reported initially improving rates of student persistence have been those that increase the level of contact between the institution and the student, such as freshman seminars and advising models (Milem & Berger, 1996; Tinto, 1997; Levitz, Noel, & Richter, 1999; Schnell & Doetkott, 2003; Davig & Spain, 2003-2004; Habley & McClanahan, 2004). Perhaps this is because, by their nature, such programs are the most capable of offering support for both social and psychological needs at the individual level.

Drawing on the work of Braxton, Sullivan and Johnson (1997) in regard to Tinto's theory of college student departure, Yorke and Longden (2004) persuasively argue that successful retention of students will be achieved by those institutions that embrace a holistic cultural approach. They put forward three constructs advanced by

Braxton and Hirschy (2004) that they consider to be essential foundations of such a culture: “the commitment of the institution to student welfare, institutional integrity and communal potential” (Yorke & Longden, 2004, p. 92). The commitment of the institution to student welfare means that the decisions made by the college are perceived by students as having the students’ interests as the chief concern. Institutional integrity refers to the sense of justice in the decisions made, and a commitment by the college to honor the promises it has made to its student (Yorke & Longden, 2004). This commitment will only be perceived by students if it is upheld by all the institution’s departments, at all levels (Yorke & Longden, 2004). The concept of communal potential implies that students feel the college provides opportunities for them to be involved in the decision making, educational aspects and social components of college life (Yorke & Longden, 2004).

Conceptualizing student persistence as relational, with both the student and the institution having responsibilities that need to be met if graduation is to be the eventual outcome, Yorke and Longden (2004) put forward twenty-four recommendations for institutions to adhere to and a further twelve that students themselves need to work towards. In what they suggest a marked relationship with the kinds of educational principles advocated by Chickering and Gamson (1987) and Tinto (1993) can be seen. Their suggestions include general principles such as promoting a sense of belonging; academic practices that ensure the use of pedagogical techniques conducive to student learning and make use of formative assessment; supporting students who are struggling to cope with the demands of a program; and, being aware of and sensitive to events that impact students lives outside of the institution (Yorke & Longden, 2004).

Considering the influence of Bourdieu's (1973) concept of cultural capital on a student's level of comfort with the culture espoused by an institution, Kuh (2001-2002) warns against an uncritical acceptance of the power of campus culture to influence academic outcomes. However, he too feels that the desire of institutions of higher education to increase student persistence rates would be well served if certain cultural and structural changes were instigated. Institutions have an obligation to clearly articulate their values and expectations to current and prospective students (Kuh, 2001-2002; Tinto, 1993). In order to improve a campus's culture institutions should conduct comprehensive examinations of student experiences inside and outside the classroom. Work then needs to be done to ensure that the results of these examinations are intentionally tied to a curriculum designed to promote good educational practices (Kuh, 2001-2002). Administrative and disciplinary systems that are unnecessary and that create obstacles to student success should be removed. Also, institutions need to be aware of the effects that proximal peer groups in settings such as dormitories are having on student persistence and work to alleviate negative situations (Kuh, 2001-2002).

Tinto (2007), in his presentation "Taking Student Retention Seriously", suggests five factors as supportive of student persistence: expectation; advice; support; involvement; and learning. Students, especially those who have been historically underserved by higher education, are more likely to persist and graduate if their institution expects them to succeed. Like Kuh (2001-2002), Tinto (2007) considers that the likelihood of student persistence is increased "in settings that provide clear and consistent information about institutional requirements and effective advising about the choices students have to make regarding their programs of study and future career goals"

(p.2). Students also need to be academically, socially, and personally supported as they progress through college. Again, Tinto (2007) and Kuh (2001-2002) agree that whatever the form such support takes, it should be connected to the other parts of the student's collegiate experience, not separate from it. In support of Astin (1984) and his own earlier work, Tinto (2007) states that providing a student with opportunities to become more involved in their education is vital to student persistence. Finally, acknowledging the link between learning and involvement, Tinto (2007) believes that "students are more likely to persist and graduate in settings that foster learning" (p.3). Like the recommendations suggested by Yorke and Longden (2004) and Kuh (2001-2002), the implementation of Tinto's (2007) five factors would reverberate throughout the whole of a campus's culture.

What the above works emphasize is that a focus on maximizing student retention alone or on minimizing the impact of attrition factors is not enough, nor is it enough to use only a monodisciplinary lens to attempt to understand such a multifaceted phenomenon. As Yorke and Longden (2004) believe, a focus on retention alone "risks mistaking symptom for cause" (p. 132). What is needed are institutional practices that seek to promote student success through teaching, learning and assessment, through high expectations of student effort, and through improved institutional support services.

### Sophomore Research

Driven by the high numbers of students that leave during the first year of college (Consortium for Student Retention Data Exchange, 1999 cited in Habley & McClanahan, 2004; Tinto, 1993) and a need to use limited financial and time resources to the greatest

effect (Tinto, 1994), the majority of institutional strategies aimed at reducing student non-persistence have targeted the freshman cohort. However, even when initiatives have had the desired effect of improving the freshman to sophomore transition, colleges are recognizing that problems of persistence continue into subsequent academic terms. For example, Pace University reported that despite an increase in their freshman retention rates, they experienced a 9 percent drop in their sophomore retention (Williams et. al., 2006). Others (Gohn, Swartz, & Donnelly, 2001; Olcott & Kotovich, 2007) have also found a significant loss of students during the sophomore to junior year transition.

Tinto (1993) suggests that the important issues for students during their freshmen year may not be important issues for students at other stages of a college career, indicating that individual programs designed to increase freshman persistence may not equip students to overcome the unique challenges of later college years. Graunke and Woosley (2005) note that, unlike freshmen, involvement in non-educational campus activities and the student's stated intentions to re-enroll at the same institution are not significant predictors of a student's academic performance during the sophomore year. Olcott and Kotovich (2007) perceive that whilst the freshman year is more a time of adjustment to external change, the sophomore year involves dealing more with internal change. Sophomore students are questioning their direction and purpose, trying to fit their academic undertakings into their long term goals (Olcott & Kotovich, 2007). Gardner (2000) states that sophomores were more likely than students in other year cohorts to identify their biggest personal problem as confirming their selection of a major or deciding on an appropriate career. It is possible that tensions arising from

uncertainties about which major to select may have adverse effects on student persistence (Anderson & Schreiner, 2000).

According to Pattengale and Schreiner (2000), institutions tend to abandon support strategies for sophomores prematurely, turning their attention to the next incoming cohort. Student retention strategies designed solely to transition students through their first year of college with no longitudinal focus, leave the later cohorts of students with limited support. As students move away from general education courses, distance is created between sophomores and the college instructors and advisors with whom they established previous relationships. For some sophomores new concerns arise resulting from a failure to secure their intended major or from the repercussions of freshman choices (Yorke & Longden, 2004). In many institutions these concerns are compounded by a re-negotiation of living arrangements that occurs during this transition period. Olcott and Kotovich (2007) see these factors as creating an environment for potential feelings of isolation within the sophomore cohort. They consider this sense of isolation to be an underlying causal factor in the increased distance from institutional communities exhibited by sophomore students (Olcott & Kotovich, 2007). Pattengale and Schreiner (2000), and Graunke and Woosley (2005) agree with this analysis.

Although the research investigating sophomore persistence is limited, findings point to three important conclusions. Firstly, the sophomore year has needs unique to their cohort and those needs are being largely overlooked by institutions of higher education. Secondly, strategies that may work for freshmen may not work for sophomores as factors influential in student persistence have differing degrees of importance for the two cohorts. For sophomore students academic and personal concerns

appear more important than social ones. Finally, the effects of institutional retention efforts that focus solely on improving the first year experience may not be sufficient to support student persistence through the later college years. These conclusions support the arguments of Yorke and others that what is needed to improve longterm persistence is not another program but rather a holistic restructuring of institutional culture (Kuh, 2001-2002; Tinto, 2007; Yorke & Longden, 2004).

In considering improving persistence there is also a need for greater attention to be given to the challenges of sustainability facing higher education. Tinto's (1994) point that there is a limit to both the human and monetary resources available to an institution must be considered in looking for a way forward. Both he and Levitz and Noel (1989) recommend that, in order to achieve the most efficient and substantial impact on persistence rates, institutional efforts need to focus on the freshmen year. The current economic climate with regard to institutional funding makes such efficiency increasingly necessary. Other educational research also points to the benefits of the disproportional allocation of resources in favor of the first-year (Choy, 2002; Yorke; 2003; Yorke & Longden 2004). Viable solutions need to be sensitive to the increased diversity among students entering higher education, the increased incidence of academically under-prepared students, and the resources available to institutions to address these problems.

This raises the question as to what can be done during the freshman year that can be sustainably supported throughout a student's college experience, will equip students with the skills needed to reach the desired outcomes of college regardless of individual differences and will help them overcome the unique problems faced during the various stages of college. Astin (1993a) suggests that the answer "springs from the ongoing

commitment of an institution, of its faculty and staff, to the education of its students” (p. 212), though he too warns that “such commitment requires institutional change. It requires that institutions rethink traditional ways of structuring collegiate learning environments and find new ways of actively involving students, as well as faculty, in their intellectual life. It requires a deeper understanding of the importance of educational community to the goals of higher education.” (p. 212)

### The Development of the NSSE

The increased scrutiny of undergraduate education has brought about change. As stakeholders continue to demand to be both informed about and assured of the quality of colleges there has been an increased use of outcomes assessments by institutions. These outcome measures are providing important information to stakeholders about what students have gained from college and what graduates are capable of. Examinations of quality have also brought increased attention to the notion of wastage. That is, concerns for the economic merit of higher education and cries from advocates for social justice brought increased attention initially to problems of student attrition and later to student persistence.

Key researchers over the past two decades (Astin, 1993a; Ewell, 2002; Ewell & Jones, 1993; Kuh, Pace & Vesper, 1997; Kuh & Vesper, 1997; Pascarella & Terenzini, 1991) have stressed that improving the quality of higher education involves more than the monitoring and reporting of desired outcomes. Simply monitoring the outcomes of higher education is insufficient to provide institutions with enough information to instigate change. Kuh, Pace and Vesper (1997) note that, while measurements of higher

education outcomes can provide data on what a student has gained from college, they do not necessarily indicate which student behaviors and institutional practices produce these outcomes.

Institutions are moving away from efforts focused solely on addressing risk factors of attrition and looking instead at how to promote student success and growth. On the basis of research which pointed to the importance of the whole institution for achieving this, examining and improving the social and academic environments experienced by students has become the new imperative of efforts seeking to improve persistence (Astin, 1993a; Kuh, 2001-2002; Tinto, 1993, 1997, 2007; Yorke & Longden, 2004). Shulman (2002) reinforced this by a taxonomy that positions the notion of student engagement as a fundamental purpose of education, one which enables students to become continuous, independent learners with benefits stretching beyond graduation. According to Shulman (2002), having a tool that measures engagement is vital as it would provide insights into areas of student learning, understanding and post-graduation commitments that cannot be measured directly.

Finally, criticism of existing, misleading means of ranking institutional quality (Astin, 1985) has also fueled discussions about the need for more informative measures (Pascarella & Terenzini, 1991). Ranking systems that emphasize institutional resources, reputation and entering students test scores are less useful in assessing quality than a system that examines how effectively institutions use the resources they have available to promote the growth, development and success of matriculating students (Kuh, Hayek, Carini, Ouimet, Gonyea & Kennedy, 2001).

In response to the need for more informative measures of undergraduate educational quality, the NCES (1991) recommended the development of process indicators, measures of behavior associated with desired outcomes of college (Banta, 1993; Ewell & Jones, 1993). Kuh and associates (1997) note that:

Such indicators serve two institutional improvement functions. They can help institutions identify whether activities and opportunities for learning are in ample supply and whether students are taking advantage of the institution's learning resources. They also can help focus faculty, staff, and students on those tasks and activities that are associated with higher yields in terms of desired student outcomes. (Kuh, Pace & Vesper, 1997, p. 436)

Process indicators are also attractive in that they tend to be less expensive to develop and administer than outcomes assessment measures, and provide information that can be used immediately to enhance student learning (Kuh, Pace & Vesper, 1997).

In 1999 the Pew Charitable Trusts and the Carnegie Foundation for the Advancement of Teaching commissioned Kuh to develop and launch a tool that would provide institutions with the kind of information that would help bring about improvements to undergraduate education and give a more informative means of assessing quality (NSSE, 2001). Drawing on voluminous research in student satisfaction, persistence and development (Astin, 1984 & 1993a; Chickering & Gamson, 1987; Ewell & Jones, 1993 & 1996; Kuh, Schuh & Whitt, 1991; Pace, 1979, 1982 & 1995; Pascarella & Terenzini, 1991; Tinto, 1993) the NSSE was the result of that commission.

According to the NSSE (2008a) the potential of the NSSE goes well beyond "fixing the rankings" (p. 1). The information gathered by the tool is useful to individual institutions of higher education, allowing them to examine how to improve their educational practices and campus environment (Kuh, 2001; NSSE, 2008a). For example,

the data can be used by colleges to gauge the degree of institutional success in fostering practices consistent with particular institutional characteristics and commitments (NSSE, 2008a). Results from research using the NSSE tool and the raw data of the tool itself can be helpful to a range of external stakeholders of higher education, including accrediting bodies and state oversight agencies (Kuh, 2001; NSSE, 2008a). Finally, making institutional results public serves an important role in providing prospective students with another informative source of information (Kuh, 2001; NSSE, 2008a). This could lead to improvements in the institution-student match, an important component in improving student retention advocated by many researchers in the field (Bean, 1981; Kuh, 2001-2002; Tinto, 1993; Yorke & Longden, 2004).

The NSSE was built on the premise that “[w]hat students do during college counts more in terms of desired outcomes than who they are or even where they go to college” (Kuh, 2004, p. 1). Students who are more engaged in behaviors that represent empirically tested good practices of undergraduate education benefit more from their education than students who are less engaged (Kuh, 2004). The NSSE attempts to measure the degree of this engagement. That is, the NSSE measures the amount of time and effort students put into their studies and other educationally purposeful activities, and how institutions of education deploy their resources and organize their curriculums, other learning opportunities, and support services to induce students to participate in activities that lead to desired outcomes such as persistence (Kuh, 2001; Kuh et. al., 2006).

In general, freshman classroom experiences and experiences with faculty and peers are better predictors of desired educational outcomes than precollege characteristics (Gerken & Volkwein, 2000). In their assessment of how college affects students,

Pascarella and Terenzini (2005) finish by stating that “the impact of college is largely determined by individual effort and involvement in the academic, interpersonal, and extracurricular offerings on a campus.” (p.602) Inclusive and affirming institutional environments as well as the clear communication of expectations and policies are also important to student learning (ECS, 1995; Kuh, 2001-2002; Kuh et. al., 2006; Pascarella, 2001; Yorke & Longden, 2004).

According to a paper published by the Pew Charitable Trust, the questions that comprise the NSSE fall into three broad categories (NSSE, 2008a). The category concerned with institutional actions and requirements includes specific items about the curriculum, such as the amount of reading or writing required of students. It also incorporates questions about faculty behavior, asking students to report on their interactions with instructors. The next category includes questions regarding student behavior. These items are about how students spend their time inside and outside of the classroom. Finally, the NSSE measures student reactions to college by including items that seek students’ perceptions about the quality of their own experiences. This last category also includes questions about self-reported gains in skills that students feel they have developed as a result of attending college (NSSE, 2008a).

The survey instrument is administered to first-year and senior students with results providing insight on how effectively colleges are contributing to learning in five areas: (a) Level of Academic Challenge, (b) Active and Collaborative Learning, (c) Student-Faculty Interactions, (d) Enriching Educational Environment, and (e) Supportive Campus Environment (Kuh, 2000) . The NSSE (2000) labels these five areas as the “benchmarks of effective educational practice” (p.3). The combination of these

measurements forms the operational definition of student engagement (Hayek & Kuh, 2002). Students who are engaged at a reasonable level in all of the benchmarks will gain more from their college experience than do those who are engaged in only one or two areas (NSSE, 2000).

Eleven items (Appendix B) make up the NSSE index for the LAC. The items gather data on time spent preparing for class, the amount of reading and writing completed over the course of the academic year, the opportunities for deep learning, and institutional expectations for academic performance (NSSE Codebook, 2007). Research demonstrates that colleges can improve student success and levels of persistence by emphasizing the importance of academic effort and by setting high expectations for student performance (Astin, 1993a; Chickering & Gamson, 1987 & 1991; ECS, 1995; Ewell & Jones, 1996; Light, 2001; Pascarella 2001; Pascarella & Terenzini, 1991 & 2005; Ryan, 2005; Tinto, 1993). Astin's (1984) theory of student involvement emphasizes that the extent to which students can achieve particular developmental goals is a direct function of the time and effort they devote to activities designed to produce these gains.

Schroeder and Hurst (1996) posit that certain core conditions must be present for an optimal learning environment. Included in these is the existence of challenge and the opportunity to apply knowledge (Schroeder & Hurst 1996). Light's (2001) discovery of a correlation between the "amount of writing required in a course and the student's overall commitment" (p. 52) supports the importance of these core conditions. In his forward for the Community College Survey of Student Engagement (CCSSE, 2008), Tinto echoes what motivation literature has been stating for years, "[h]igh expectations are an essential

condition for student success” (p. 2). Csikszentmihalyi (1997) suggests a need for balance between challenge and competence. Activities that are perceived as too challenging relative to skill level are anxiety producing, while those that are perceived as not challenging enough produce apathy and boredom (Csikszentmihalyi, 1997). Taken with the arguments of Bean and Eaton (2000) this notion carries implications for the structuring of college curriculums that could be important in improving student persistence.

Using the NSSE benchmarks of effective educational practice and Chickering’s and Gamson’s (1987) seven principles, Ryan (2005) explored the potential relationship between particular engagement variables and various outcomes of interest to students and institutions. The overall results of the study suggest that high expectations and prompt feedback on academic performance may provide the most fruitful avenues for improving undergraduate education outcomes at large, research-extensive universities (Ryan, 2005). Ryan (2005) concludes that “[f]urther inquiry and study focused on individual institutions by both researchers and leaders along the lines suggested by this study appears warranted” (p.30).

Research by Umbach and Wawrzynski (2005) demonstrates the key role that LAC can play in the promotion of other areas of engagement closely linked with student persistence. For example, first-year students are more likely to interact with faculty on campuses where those faculty offer greater academic challenges (Umbach & Wawrzynski, 2005). Additionally, student gains appeared to be positively related to the levels of challenge faculty introduced during instruction. Higher levels of academic challenge were positively related in the study to gains in general education knowledge

and practical competencies for freshman students, and faculty reported emphasis on high order cognitive activity was also found to increase student involvement in active and collaborative learning opportunities (Umback & Wawrzynski, 2005).

Braxton, Milem and Sullivan (2000) utilized a longitudinal design consisting of first-year, first-time students to explore four types of active learning classroom behaviors at a research institution of higher education. The four factors were: class discussion; knowledge level examination questions; group work; and, higher order thinking activities. Their results showed that class discussions and higher order thinking activities are positive influences on social integration. In addition, class discussions also influence subsequent institutional commitment in a positive way, while knowledge level exam questions negatively influenced student persistence (Braxton et. al., 2000).

The above research demonstrates that LAC is not only a valuable method of supporting desirable outcomes for students in its own right, but that it is also an enabling force for other areas of influence as well. The benchmark highlights the importance of how colleges structure their curriculums and set expectations for their students. It also underlines the responsibility of students to act on the opportunities presented them by their colleges.

Seven items on the NSSE make up the second benchmark, ACL. This benchmark looks at student behavior associated with class participation, working collaboratively with other students inside and outside of class, tutoring and involvement in community-based projects (NSSE Codebook, 2007). If students are uninvolved in the classroom they will very likely be uninvolved in other aspects of their educational experience (Tinto, 1994). Kuh, Schuh, Whitt, and associates (1991) contend that colleges with high student

involvement provide the best environment for student learning and development.

Students are more likely to be satisfied with their education and feel a sense of loyalty to their institution if the institution promotes active participation on the part of students in campus life and learning (Kuh et. al., 1991).

Chickering and Gamson (1987) promote active learning among their seven principles of good undergraduate education. They insist that, in order for learning to be effective and lead to the beneficial outcomes of college, students must talk about what they are learning, write about it, relate it to past experiences and apply it to their daily lives (Chickering & Gamson, 1987). Also intertwined with ACL is another of these two authors' principles, the development of reciprocity and cooperation among students. Based on fifty years of accumulated evidence they state that by working with others, and sharing and responding to ideas, students' involvement in learning is increased, their ability to think is enhanced, and their understanding deepened (Chickering & Gamson, 1987).

In their synthesis of research on students' cognitive skills development and intellectual growth, Pascarella and Terenzini (1991) report three instructor-influenced classroom interactions that are consistently and positively linked to these two components. These interactions are: "the degree to which faculty encouraged, praised, or used student ideas; the degree to which students participated in class and the cognitive level of that participation; and the extent of peer-to-peer interactions in the class" (p.146). By comparison, the more traditional lecture approach to classroom instruction is less effective at facilitating the development of critical thinking skills. Light (2001) reports that students enrolled in large lecture style classes were found to be less engaged,

interacted less with fellow students during class and learned comparatively less than students enrolled in smaller classes.

Tinto (1997) and others (Chickering & Gamson, 1987; Ewell & Jones, 1996; Light, 2001; Pascarella & Terenzini, 1991; Schroeder & Hurst, 1996; Zhao and Kuh, in press) advocate the collaborative learning processes promoted by learning communities.

Tinto (2007) states:

As students learn more and see themselves as more academically and socially engaged, their persistence is enhanced. Their involvement with others in learning within the classroom becomes the vehicle through which attachments are made and commitments to the institution engendered. (p. 5)

Shapiro and Levine (1999) report that students participating in learning communities are more engaged overall, have higher persistence rates, and evidence greater gains in intellectual and social development compared with peers who did not participate in learning communities. In a large public research university setting, Tinto and Goodsell (1993) similarly found that freshmen students, who participated in a type of learning community known as Freshmen Interest Groups, had higher grades and levels of persistence.

Like Tinto (2007), Pascarella and Terenzini (1991) and Light (2001) consider that the collaborative learning experienced in learning communities provides a means for students to become more academically and socially involved leading to an increase in their learning, stronger bonds with peers, and a deeper connection and commitment to the college itself. This is supported by the work of Astin (1984 & 1993a) and Tinto (1993). Experiencing this type of learning also leads to students forming more positive views of

the institution and a sharper perception of the quality of their learning (Pascarella & Terenzini, 1991).

Lenning and Ebbers (1999) contend that learning communities benefit both students and faculty. For students, participating in a learning community promotes: higher academic achievement; increased levels of satisfaction; improved critical thinking and communication skills; a better understanding of self and others; a greater ability to integrate the social and academic environments of education; and higher levels of persistence. The author suggest that benefits for faculty comprise: a diminished sense of isolation; increased levels of cooperation between disciplines; higher levels of curricular integration; the stimulation of fresh ideas; and increased satisfaction with their students' progress and learning (Lenning & Ebbers, 1999).

ACL is an achievable and practical goal for institutions of higher education. Classroom based pedagogical practices such as problem based learning (Ahlfeldta, Mehtab & Sellnow, 2005) can be used to provide students with an appropriate environment in which ACL can occur. Also, learning communities offer a vast array of methods for institutions to support ACL. According to Lenning and Ebbers (1999), learning communities can be used as a structural tool within the curriculum, co-enrolling students from the same or differing disciplines in a series of shared courses linked by a common theme. They can be situated within the residential component of the student's experience, made up of organized on-campus living arrangements that position students taking two or more common courses in close physical proximity (Lenning & Ebbers, 1999). This can increase the opportunities for out-of-class interactions and supplementary learning. Alternatively, they can be used within the classroom by

adopting cooperative learning techniques and group activities (Lenning and Ebbers, 1999).

The third NSSE benchmark, SFI, is made up of six questions on the survey. These questions seek to measure the extent to which students are talking with faculty members and advisors, discussing ideas from classes with faculty members outside of class, getting prompt feedback on academic performance, and working with faculty on research projects (NSSE Codebook, 2007). In the research literature on student satisfaction and retention virtually everyone agrees that student-faculty interaction is an important factor in student success and the attaining of many of the desired outcomes of college (Astin, 1984 & 1993a; Bean, 1985; Chickering & Gamson, 1987; Kuh et. al., 1991; Kuh et. al., 2006; Pascarella and Terenzini, 1991 & 2005; Tinto 1993).

Chickering and Gamson (1987 & 1995) consider frequent contact between students and faculty, both in and out of classes, to be the most important factor for student motivation and involvement. Astin (1993a) reports that, “next to the peer group, the faculty represents the most significant aspect of the student’s undergraduate development” (p. 410). Astin (1993a) found evidence of a positive correlation between student interactions with faculty, both formal and informal, and higher levels of student satisfaction. In addition, “student-faculty interaction also has positive correlations with every self-reported area of intellectual and personal growth, as well as with a variety of personality and attitudinal outcomes” (Astin, 1993a p. 383). Ewell and Jones (1996) also documented a strong association between both formal and informal faculty-student contact and enhanced student learning. These interactions with faculty are frequently

shown to be among the best predictors of student persistence (Braxton, Sullivan, & Johnson, 1997; Stage & Hossler, 2000).

Beyond the freshman year interactions with faculty remain important. For sophomore students, these interactions lead to improved academic performance and satisfaction (Graunke and Woosley 2005; Juillerat 2000). Nagda, Gregerman, Jonides, von Hippel, and Lerner (1998), in exploring the influence of student-faculty research partnerships in the sophomore year, found a positive relationship between participation in these partnerships and lower rates of attrition. Interactions with faculty can lead to improvements for historically underserved students also. Anaya and Cole (2001) found that increased contact between Latino students and faculty was positively related to improvements in grades. First-generation students who reported positive interactions with faculty are also more likely to report being satisfied with college life, and have better grades and persistence (Amelink, 2005).

Pascarella and Terenzini (1991) hypothesize:

That when faculty are committed to creating quality learning experiences, when they are consistent in showing respect, caring and authenticity, and when they are willing to interact with students in a variety of settings, then development of competence, autonomy, purpose and integrity is fostered (p. 316).

Braxton, Bray and Berger (2000), working within Tinto's (1993) theory of student departure, used a series of student self-reports to examine the perceptions of faculty teaching skills as a predictor of student persistence. Findings indicated that students who perceived the faculty to be well prepared and organized had greater levels of social integration, which in turn had a positive influence on institutional commitment and on intent to reenroll (Braxton et. al., 2000).

In a qualitative study (Chambers, 2008) in which faculty recognized for teaching excellence were interviewed about their beliefs on the role of faculty in promoting persistence, several themes emerged that were consistent with much of the student centered research about the importance of faculty. Participants in the study felt that faculty interactions both inside and outside the classroom were crucial and that they had a responsibility to support students through the characteristics outlined by Pascarella and Terenzini (1991) above. Other findings of this study, however, highlighted problems faced by faculty in achieving effective interactions. Participants felt ill prepared and under supported in many aspects of student advising, and felt that what happens in their classrooms was not valued by the institutional review boards (Chambers, 2008).

Yorke and Longden (2004) argued that resources would be well spent if they were invested on such factors as educating faculty to be better educators and advisors, and on providing individual students with meaningful ways to connect to the institutional community and faculty. They based this proposition on the notion that faculty are one of the principal points of contact through which the student populace experiences the culture of the institution including its values (Schreiner, 1988; Yorke & Longden, 2004).

The importance of advising is well documented in research on student retention and satisfaction. Light (2001) sees good advising as possibly the single most underestimated characteristic of a successful college experience. Beal and Noel (1980) identified inadequate academic advising as the greatest impediment to student retention. Baxter (2004) in a series of interviews with early school leavers from a single institution found that 54% of early leavers receive no academic advising or were dissatisfied with the advising they received. Tinto (1999) recommends that institutions seriously

interested in improving student persistence need to weave academic advising into the “fabric of the freshman year in ways that promote student development and that provide clear, consistent, and accurate information that is easily accessible to students” (p. 8).

Despite the quantity of literature supporting a correlation between student-faculty interactions and desirable college outcomes, Hu and Kuh (2002) found that the effects of student-faculty interaction are conditional. Although students characterized by better academic preparedness and the devotion of higher levels of effort to their studies tend to interact more frequently with faculty members, the direction of influence in this relationship is not clear (Hu & Kuh, 2002). Pascarella and Terenzini (1991) suggest that high achieving students may have well-established skills prior to college entry that facilitate the ability to become more involved. They recommend caution, asserting that it is possible that “students with initially high educational aspirations are most likely to interact socially with faculty and that such interaction serves to enhance further initial aspirations” (p. 394). Such an assertion is consistent with Bourdieu’s (1973) theory of cultural capital and disparities in the persistence rates between first generation and second generation students (Billson & Terry, 1982; Horn, 1998; Ishitani, 2003, 2005 & 2006). Hu and Kuh (2002) also report evidence that too much out-of-class contact with faculty has a potential negative effect on progress towards desired outcomes.

Although they urge caution, Hu and Kuh (2002) and Pascarella and Terenzini (1991) nevertheless conclude that interactions with faculty are vital to student development. SFI comprises an important measure of those student behaviors that lead to desired college outcomes, such as grades and persistence. Having access to data that captures how students and faculty are interacting can provide institutions of higher

education with the means to ensure that this beneficial process is occurring on campus. As Kuh et. al., (2006) conclude, “In general, for most students most of the time, the more interaction with faculty the better.” (p. 41)

The EEE benchmark, consisting of twelve questions, gathers data on the extent to which students are interacting with others from different racial or ethnic backgrounds, or who have differing political opinions or values. It also examines the extent to which students are using electronic technology, and participating or planning to participate in activities such as internships, community service, study abroad and co-curricular activities (NSSE Codebook, 2007). Astin (1993a) identifies several important peer interactions that foster student development including: participating in collegiate sports; discussing racial or ethnic issues; socializing with someone from a different racial or ethnic group; and, spending time each week socializing or in student clubs or organizations. Kuh and colleagues (2006) concur that experiences of diversity and increased peer-peer interactions “can have substantial and positive effects for virtually all students and across a wide range of desirable college outcomes” (p. 43). Pascarella and Terenzini (2005) suggest that diverse environments provide students with the means to develop the skills they require to succeed in college, and also cater to students’ psychological and social need for integration.

Citing past research, Umbach and Kuh (2006) state that experience with diversity “appears to be positively associated with retention rates and degree aspirations (Chang, 1999), more frequent participation in community service (Bowen & Bok, 1998; Gurin, 1999), and higher levels of civic engagement, cultural awareness, and commitment to improving racial understanding (Milem, 1994)” (p. 170). Villalpando (2002) reports that

regardless of students' race or ethnicity, after four years at college interactions with students from differing racial and ethnic backgrounds, and exposure to diversity focused subjects in the curriculum contributed to increased ratings of overall satisfaction.

Pascarella, Edison, Nora, Hagedorn and Terenzini (1996) in the National Study for Student Learning, discovered students who had reported interactions with peers from differing racial or ethnic groups, or with differing interests and values showed a greater openness to diverse perspectives and a willingness to challenge their own beliefs after the first year of college. Interactions with diverse peers have also been linked to more frequent discussion of complex social issues, including such things as the economy and major social issues such as peace, human rights, equality, and justice (Springer, 1995). Hurtado (1999) and King and Shuford (1996) advanced the view that exposure to diverse perspectives improves critical thinking which heightens cognitive and social development. Exposure to diversity of ideas and beliefs has been linked to enhanced cognition by others as well (Hu and Kuh, 2003; Milem, 2003).

Experiences of diversity may indirectly lead to improvements in campus climate, which is linked to beneficial outcomes for the whole student population (Gurin, 1999). Recently, however, Pike and Kuh (2006) did not find support for this correlation in their study that examined the relationships among the "diversity of the student body (i.e. structural diversity), interactions among diverse groups of students (i.e., informal interactional diversity), and perceptions of the campus environment" (p. 426). Concerned that past studies into the effect of ethnic diversity on student learning and development lacked the use of objective measures, Herzog (2007) conducted a unique study that sought to objectively examine the impact of three types of diversity: interactional;

curricular; and, compositional. Based on the study's findings Herzog (2007) is skeptical of claims that diversity improves educational outcomes. Pike, Kuh and Gonyea (2007) reported that while interactions with diverse racial and ethnic peers had no effect on how students perceived the campus environment, this may suggest that the quality of interpersonal relations as experienced by college students is more a function of other institutional characteristics and the programs and practices colleges provide to enhance student engagement and success for all their students.

Although there is contention over the ability of diverse learning environments to improve educational outcomes, it remains an aspect of the student experience which is useful to monitor. Faced with the increases in racial or ethnic diversity within U.S. society, demands are being placed on colleges to prepare students to function effectively in a diverse society (Association of American Colleges and Universities, 1995). Pike et. al. (2007) confirm interactions with diverse peers as a means to meet these demands. Bowen and Bok (1998) assert that this challenge is now a core mission of higher education.

Skills are most effectively learned in a context that gives them meaning (Tinto, 1993). This proposition is supported by Pascarella and Terenzini (1991) in their review of literature on cognitive development and is important to the second and third components of the EEE benchmark. Related to this proposition, a second component of the EEE benchmark is students' use of technology. According to Nelson Laird and Kuh (2005), higher frequency in the use of information technology in educational pursuits was more likely to lead students to consider that their course emphasized higher order thinking

skills. The recurrent use of information technology by faculty also seems to cultivate peer-group work outside the classroom (Nelson Liard & Kuh, 2005).

Also included in EEE, and related to contextualizing learning, are measures of students' intent or current involvement with educationally purposeful out-of-class experiences such as internships, community service, study abroad and co-curricular activities. Tutoring, helping to teach a course, working with a faculty member on a research project, and being involved in community service initiatives are also linked with developmental gains in self-concept, self-esteem, and self-directed behavior (Kuh et. al., 2006; Pascarella & Terenzini, 2005; Astin, Sax & Avalos, 1999). Keen and Hall (2009), in a longitudinal study of the benefits of service learning, conclude that through the dialogues and interactions promoted by well designed service programs "students can construct new understandings of what is compassionate and just and what is required of them now and in their future" (p. 77). Eyler and Giles (1999) and Astin, Vogelgesang, Ikeda and Yee (2000) demonstrate that service learning experiences are impactful on a range of educational outcomes.

Pascarella and Terenzini (1991) consider that "a large portion of the influential interactions that students have with peers takes place in the multifaceted extracurriculum" (p. 624). These interactions are a major contributing force in Tinto's (1993) concept of social integration and "the frequency and quality of students' interactions with peers and their participation in extracurricular activities are positively associated with persistence" (Pascarella & Terenzini, 1991, p. 110). Light (2001) and Astin (1993a) agree that there is a relationship between out-of-class activities and academic success and student reports of satisfaction.

The advancement of critical thinking skills, of tolerance, of civics and of students' self-concept is of value not only to the student and their future functioning in wider society, but also to wider society itself. It is important that institutions work to provide environments conducive to these components of student development. Exposure to diverse ideas and beliefs is important. One means of achieving this diversity is through racial and ethnic multiplicity within the student and faculty bodies. Incorporating technologies and opportunities for students to implement what they are learning in real life settings is another avenue that can help create such environments. Finally, supporting peer interactions through the provision of extracurricular activities can both improve student development and increase social and academic integration.

SCE, the last benchmark on the NSSE, includes six items that measure students' perceptions of how the campus "helps them succeed academically and socially, assists them in coping with non-academic responsibilities, and promotes supportive relations among students and their peers, faculty members, and administrative personnel" (NSSE Codebook, 2007, p. 15). Institutional mission and culture shape campus environments and influence student outcomes to varying degrees. Many institutions are characterized by a level of hypocrisy when it comes to living up to their espoused mission. They say one thing but do another in areas such as financial aid practices, admissions, assigning students to housing, advising, reviewing faculty performance for promotion and tenure, and so on (Chambers, 2008; Kuh, 2000). According to Yorke and Longden (2004) such inconsistencies lead to a state of disillusionment in the student populace and a failure of the institution to provide the factors necessary for student success. Students need to feel they belong at the institution. For some students this will happen as a matter of course,

for others it will require effort on behalf of the institution (Yorke & Longden, 2004). Student characteristics and beliefs coming into college can affect the students fit with an institution (Bean, 1985; Cabrera, et. al., 1992; Cabrera et. al., 1993). Hausmann, Schofield, Woods (2007) define a student's sense of belonging as the psychological sense that they are a valued member of the college community. They note that a student's starting sense of belonging is not related to factors such as race, gender, SAT scores, or financial difficulty. Rather it develops through interactions with other members of the college community. It is similar in this sense to Tinto's (1993) construct of social integration. It also functions in parallel with academic integration, increasing or decreasing the more students feel academically integrated (Hausmann et. al., 2007).

While there has been considerable effort to improve the level of support experienced by students in the first year of college, research points to the failure of campuses to provide appropriate support beyond this initial stage. Pattengale and Schreiner (2000) note that sophomore students have few opportunities to be involved in leadership positions and tend not to be as well supported by student affairs, a combination that can lead to an increased sense of isolation (Graunke & Woosley, 2005). Interestingly, Juillerat (2000) found that factors such as a sense of belonging and the perceived approachability of faculty were rated as more important by sophomore students than students of any other cohort.

Of the five propositions of Tinto's (1993) theory found to have strong empirical support by Braxton et. al. (1997), Braxton (2000) argues that four of these are logically interconnected. To begin with, a student's characteristics upon entering college impact on their initial commitments to higher education. This initial level of commitment will

also affect the student's subsequent commitment. However, the level to which the student has become socially integrated into the institution will also influence commitment at this stage. The degree of subsequent commitment sustains or erodes a student's likelihood of persisting at the institution. The greater the degree of commitment, the greater the likelihood of persistence (Yorke & Longden, 2004). Social integration is a factor that institutions can influence and is therefore an important area of a student's collegiate experience to seek to improve.

Braxton and Hirschy (2004) reduced sixty components found to be influential in the social integration of students to three key factors: commitment of the institution to student welfare; institutional integrity; and, communal potential (Yorke & Longden, 2004). Students experience these factors through the culture of the campus they attend. That is, through the thousands of interactions with members of the campus community over time common values are communicated (Kuh, 2000; Tinto, 1993). These interactions influence students' perceptions of the degree to which the college is committed to the welfare of its students. The manner in which college faculty and administrators interact with students, through personal contact and in making decisions that affect students, indicates if they value the student as a member of the campus community and are concerned for the students success (Yorke & Longden, 2004). Astin (1984) notes that when students perceive that others want them to succeed they are more likely to devote the physical and psychological energies required to succeed. Berger and Braxton (1998) point to fairness in administrative policy, the clarity of communication of expectations, and the role students are able to play in the development of policies as affecting social integration.

Concern for student learning is also a critical part of an institution's commitment to student welfare. Yorke (1999) and Li and Killian (1999) found that poorly organized academic programs, low levels of support offered by staff, and poor quality instructional practices were implicated in student decisions not to persist with college. The more students see themselves as integrated into the institution and as valued members of it, the more likely it is that they will persist (Rendon, 1994, Tinto, 1998). The perceived concern of faculty can help students get through rough times and persist with their education (Chickering and Gamson, 1987).

Integrity in the manner an institution operates is vitally important in promoting student success. If students experience an alignment between an institution's stated intentions and the practices of institutional personnel, students feel more secure in their place within the college (Yorke & Longden, 2004). Work by Helland, Stallings and Braxton (2001) demonstrates that the more students feel that their expectations about college are congruent with their experiences of college, the greater their level of social integration will be. Conversely, negative experiences will likely hinder integration, a process that can lead to a sense of isolation and eventually to non-persistence (Tinto, 1993). Students must be able to perceive a level of consistency in both the administrative and academic operations of an institution.

Finally, if students perceive that their college offers them the opportunity to interact with like peers and provides social avenues through which meaningful relationships can be established, then their commitment to the institution will be heightened (Yorke & Longden, 2004). Tinto (1997) talks about the role of the classroom in fostering a sense of community within an institution, stating that social and academic

life on a campus are interwoven. Influential social communities that enhance student development emerge out of academic activities that take place within the more limited sphere of the classroom (Tinto, 1997). Residence halls also form an arena in which a sense of community can be promoted (Berger, 1997). Kuh (2001-2002) notes that in large institutions where an identifiable unified campus culture may be hard to discern, the small sub-communities that develop form important structures for supporting student integration. Students who perceive multiple opportunities to connect with peers and who feel that their college promotes such interactions are more likely to form a sense of commitment to the institution (Yorke & Longden, 2004).

Tinto (2007) states that:

Students are more likely to persist and graduate in settings that provide academic, social, and personal support. Most students, especially those in their first year of college, require some form of support. Some may require academic assistance, while others may need social or personal support. Support may be provided in structured forms such as in summer bridge programs, mentor programs, and student clubs or it may arise in the everyday workings of the institution such as in student contact with faculty and staff advisors. Whatever its form, support needs to be readily available and connected to other parts of student collegiate experience, not separated from it. (p. 3)

### Engagement and Retention

Some existing research has explored the role of student engagement, as captured by NSSE, in relation to persistence. Kuh et. al. (2006) examined the relationships between graduation rates and institutional averages on the five NSSE benchmarks of effective educational practice. Using NSSE results from a random sample of freshman and senior students from 680 four-year colleges, these authors found correlations between four and six year institution reported graduation rates and student scores on four of the

five benchmarks (Kuh et. al., 2006). Although all benchmarks were found to correlate with four year graduations, ACL failed to prove significant when looking at six year graduation rates of seniors. For freshman students all correlations were found to be significant at  $p \leq .001$  and were moderate to strong in magnitude, with LAC, EEE and SCE being the strongest (Kuh et. al., 2006).

The researchers urge caution in interpreting their results, noting that the graduation data and the NSSE scores represent two different bodies of students: the graduation rates represent students who started college in 1998, whilst the freshman engagement scores are derived from students beginning college in 2004-2005. Also, as this study uses the institution as its unit of measurement it is unable to provide insight into what is occurring at the individual student level.

Using a narrower definition of engagement Kuh and colleagues (2007a, 2007b, 2008) found a positive correlation between engagement and persistence to the second year of college. The researchers represented student engagement using three separate measures from the NSSE: time spent studying, time spent in co-curricular activities, and a combined measure of a student's responses to nineteen questions from the first section of the survey (Kuh. et. al., 2007a, 2007b & 2008). In these studies student demographics, pre-college academic performances and characteristics such as parents' level of education were found to have a significant impact on persistence. However, this influence diminished considerably once college experiences (living on campus, enrollment status and off campus employment) were taken into account.

Hicks and Lerer (2003) utilized portions of the NSSE to measure the impact of integration on retention at one particular college. They used low (10th percentile), mean

(50th percentile) and high (90th percentile) benchmark scores to disaggregate levels of integration. The results from this study offer support for the importance of social integration in increasing student persistence (Hicks & Lerer, 2003). The researchers also pointed to an important limitation in using the NSSE tool to assess persistence. As Tinto (1993) asserts, most students who are going to cease to persist with their education do so in the first semester of college. The NSSE tool however, in order to allow students to better develop opinions about their institutional experiences, is not administered until the second semester. This means that many non-persisters have already left and are therefore not able to be included in analysis. Taking this into account, means that findings of significance would be more difficult to attain (Hicks & Lerer, 2003).

In an exploratory study at a single institution, Hughes and Pace (2003) compared the responses of those students who withdrew from college with those of students who persisted to the sophomore year. Although the study consisted of only a small sample of non-persisting students, the authors note marked differences on many NSSE items. They state that “[f]or those who withdrew, the level of engagement was always lower” (Hughes & Pace, 2003, p. 1). On two background items, first year GPA (grades) and residence, clear differences were also found. This finding aligns with similar results from past research. Pace (1984) found that the largest differences in self-reported gains in personal and social development were between on-campus and off-campus students. Astin (1993a) also associates living on campus with persistence and student success. The authors recommend the use of the NSSE in future studies to explore the student persistence phenomenon, including the use of longitudinal designs that track students who took the NSSE into their junior year of study (Hughes & Pace, 2003).

The above studies offer evidence of the potential role that student engagement can have on improving rates of student persistence. The purpose of this study is to further explore the relationship between these two important phenomena. By tracking the enrollment status of students who completed the NSSE into the junior year, and examining the effects of engagement on persistence at the individual level, this study is positioned to make a valuable contribution to the field.

## CHAPTER THREE

### METHODOLOGY

This study examines if the NSSE's measure of student engagement is a useful indicator of the likelihood of the longterm persistence of students at a single institution of higher education. More specifically, this study explores if the self-reported measures of engagement in empirically supported quality undergraduate educational practices by first-time, full-time freshmen at the end of their freshman year are a significant factor in the persistence rates of these students through to their junior year of study. For the purpose of this study student persistence is defined as progressing with study towards the achievement of degree completion by reenrolling at the same institution in a full-time status from one academic semester to the next. The study does not monitor if students who fail to persevere at the institution transferred to another institution of higher education, nor does it distinguish forced withdrawals from voluntary withdrawals.

As noted in chapter one, this study is deliberately targeted at a single institution of higher education with the aim of promoting greater faculty interest in engagement (Pike & Kuh, 2005a) and assisting the institution in discerning if engagement factors are contributing to the long-term retention of their students. Such knowledge is of value at the administrative level of the institution, providing data on how best to allocate faculty and monetary resources to improve student persistence. It can also be used to inform instructional practices at the classroom level.

This chapter presents a brief description of the research design and setting, followed by detail regarding the participants of the study, a breakdown of the NSSE instrument design, its validity and reliability, and the analysis procedures that are utilized.

### Research Design

The current study employs a quantitative methodology that uses two existing data sets to make comparisons between those students who show some degree (temporary or longterm) of persistence with higher education at a single institution and those students who do not. The design of this study is ex post facto or causal comparative in nature. Leedy and Ormrod (2005) state that, such “after the fact” (p.232) designs are legitimate research methods that can be used to seek the solution to a problem through data analysis. Importantly, they note that, as there is no direct manipulation of variables and a lack of the control element, it is impossible to draw cause-and-effect conclusions in such a design as other possible explanations and the impact of confounding variables cannot be ruled out (Leedy and Ormrod, 2005). The study also has an applied research component in that its goal is to inform practice. This goal is pursued through the use of the NSSE inventory as a process indicator. Process indicators are action orientated, providing data that can be used immediately to inform institutional policy and practice and enrich student learning (Astin, 1991; Banta, 1993; Ewell & Jones, 1993).

The independent or predictor variables (IV) of this study consist of the participants’ index scores on the five benchmarks of effective educational practice. The dependent or criterion variable (DV) of this study is the participants’ persistence with their education at the same institution. A set of control variables are also used in this

study to monitor the influence of certain background characteristics of participants on the results.

The data necessary to measure the IV are collected from the institutional reports of the spring 2007 NSSE. The participating institution began administering the NSSE in spring of 2007. It perceives that “the NSSE provides quantitative information on the time and effort students devote to educationally purposeful activities and the students’ perceptions of the quality of other aspects of their college or university experience. Because the data are benchmarked against similar institutions in a national sample, the survey is particularly effective in identifying areas where we might reasonably expect to make improvements” (Standards Two, n.d.). The purpose of this study is therefore aligned with the institution’s stated intentions as to how it proposes to use the NSSE data.

As noted in the previous chapters there are five indexes, known as institutional benchmarks, which comprise the operational measure of the construct of student engagement. The NSSE codebook (2007) reports these as: level of academic challenge (LAC); active and collaborative learning (ACL); student faculty interactions (SFI); enriching educational experiences (EEE); and, supportive campus environment (SCE). These five measures are, in turn, made up of a total of forty-two component items from the NSSE tool (Appendix B). A student’s level of engagement in each of the five measures is derived from his or her index score. This score is the student’s average response to items within the index, after all items have been placed on a 100-point scale (NSSE codebook, 2007).

Data on the DV in this study is derived from the institution’s enrollment database that tracks first-time, full-time freshmen over the course of their academic careers at the

institution. Three measures of persistence using the fall 2007 and 2008 enrollment records are constructed for the purpose of analysis. The first measure uses the enrollment records to identify those students who did not persist at the institute after their freshman year. This group is referred to as non-persisters. The second measure identifies those students who did persist through the freshman to sophomore transition but did not subsequently re-enroll for their junior year at the institution. This group is referred to as temporary or sophomore persisters. The final measure of persistence consists of those students who have remained enrolled in a fulltime status at the institution from their commencement in the freshman year through to their junior year of study. This group is referred to as longterm or junior persisters.

A binary code is used to distinguish continued fulltime enrollment versus cessation of enrollment at the commencement of the sophomore and junior academic years. So a student who did not re-enroll at the institution after the freshman year, a non-persister, would be coded with a “0” for both years. A student who re-enrolled in a fulltime status for the sophomore year but not for the junior year, a temporary persister, would be coded with a “1” and a “0” respectively. A student who re-enrolled in a fulltime status for both the sophomore year and the junior year, a longterm persister, would be coded with a “1” in both instances.

In order to assess if student pre-college academic preparedness is influencing the findings a block of control variables is used in the final stage of the regression analysis. Included are the raw ACT scores of participants, and separate measures of their mother’s and father’s levels of education. The participants’ parents’ level of education serves as a proxy measure of the students’ socio-economic status and also the level of cultural capital

they hold upon entering higher education. Two other control variables are entered in this block as well. These variables are the gender of participants and whether they were living on campus at the time they took the NSSE. The review of literature in chapter two indicates the importance of examining the impact of these pre-college and background characteristics when exploring persistence.

The measure of parents' level of education contains seven categories: did not finish highschool, graduated from highschool, attended college but did not graduate, completed associates degree, completed bachelors degree, completed masters degree, completed doctoral degree. These are coded from "1" through to "7" in the order given above. With regard to gender, males are coded as "0" and females are coded as "1". Finally, dichotomous coding is also used for a student's residential status, with "0" indicating a student lived in campus accommodation during their freshman year and "1" indicating they had an off-campus residency. Appendix D contains tables of frequency counts and descriptive statistics for these variables.

### Setting

The setting for this study is a Mountain West Research University classified by the Carnegie system as a large four-year research university with high research activity. It is primarily residential with very high undergraduate enrollment. For the 2006-2007 academic year, institutional data indicated that the number of full-time undergraduates was 9153, with a further 1679 part-time undergraduates. The gender breakdown of this group was 46% female and 54% male. Of these students 89% were White, with the next largest group being American Indian / Alaskan Native representing 2% of the population.

Of the 10832 undergraduates enrolled, 1942 were first-time, full-time freshmen, of which 74% lived on campus. 65% of the students attending the institution came from within the state, 32% came from other states and territories and approximately 3% came from other countries. Of its fall 2006 first-time, full-time freshman the institution reported that 71.4% returned for fall 2007 and 60.5% of the original cohort were still enrolled in the fall of 2008. Reporting further actuarial data, the institution states that the student to faculty ratio in 2007 was a total of 16 students per faculty member. Of the total of 553 full-time faculty employed, 80% held the highest degree in their respective field. Also, 87% of undergraduate classes had fewer than 50 students, 60% had fewer than 30.

### Participants

The intended population for this study is current and future freshman students at the institution at which the study is situated. The participants for this study consist of randomly sampled first-time, full-time freshmen who completed the NSSE at the end of their freshman year in 2007. First-time, full-time students are those freshmen who are enrolled in a minimum of twelve credits, are of traditional age, and began their higher education at the current institution. For the purpose of this study this defined group of students is appropriate for several reasons. Firstly, the progression of time since taking the NSSE places these students in the first term of their junior year, an obvious and necessary attribute for this study. Secondly, the enrollment status and key demographic characteristics of the members of this group of students have been specifically recorded by the institution. Also, by using this group, certain confounding variables for which data was insufficient or unavailable are blocked. Past studies into student early departure

from college reveal that transfer students (Bers & Nyden, 2000, Harrison, 2006), mature-aged students (Horn, 1998; Price, 1993; Windham, 1994), and students studying part-time (Brawer, 1996; Feldman, 1993; Horn, 1998; Price, 1993) are at an increased risk of non-persistence.

In the spring semester of 2007 a random sample of 470 freshman students completed the NSSE self-report tool. Of these respondents 362 can be classified as first-time, full-time freshmen according to the criteria stated above. This selected sample consists of 165 males and 197 females. The average age of both genders is approximately 18. The participants are enrolled in a range of academic fields with the largest concentration (15.0%) identifying as Other (NSSE codebook, 2007) and the second largest concentration (14.1%) identifying as Arts and Humanities majors. The Other category of major includes agricultural majors which made up (9%) of 2006-2007 freshman enrollments at the institution. There is also diversity in the levels of education obtained by the parents of the participants with 98 students being first generation and 264 from families with at least one college graduate parent. Of the sample, 74.6% were living in campus accommodation at the time they took the NSSE. The average GPA of the sampled participants at the end of their freshman year was 3.2. The sample is extremely homogeneous with 94.8% made up of students who identify themselves as White.

Of the sample, 61 (16.9%) students did not persist to their sophomore year. This figure represents a higher rate of freshman to sophomore retention in the sample (83.1%) than the institution reported for its 2006 first-time, full-time freshman cohort (71.4%). A further 49 (13.5%) students did not reenroll for their junior year of study at the institution. Compared to enrollment data on the 2006 cohort of students, this figure

indicates that approximately the same percentages of students did not persist in the sample (13.5%) and the population (10.9%) from the sophomore to junior year.

However, the overall persistence of the sample through to the junior year remains higher than in the population, 69.6% compared to 60.5% respectively. Table 1 shows a breakdown of the sample characteristics compared with those of the complete cohort of first-time, full-time freshmen who began at the institution in fall 2006.

Table 1. Comparative Data

Characteristic	Sample (N=362)	2006-2007 Cohort (N=1942)
Average ACT Scores	24.0	24.0
Average Freshman GPA	3.24	3.30
Average Age	18.72	18.40
Living on Campus	74.6%	74.0%
White Students	94.8%	89%
Female Students	54.4%	41.9%
Male Students	45.6%	58.1%
Sophomore Retention	83.1%	71.4%
Junior Retention	69.6%	60.5%

#### Instrument: Validity and Reliability

The tool used for this study is the National Survey of Student Engagement: The College Student Report (see Appendix A). Forty-two items on this inventory (see Appendix B) provide the measures of freshmen student engagement at the institution. The majority of these survey questions refer specifically to student behaviors that, according to prior research, correlate with positive learning and personal development outcomes of attending college (Chickering & Gamson, 1987; Kuh, 2004; Pascarella & Terenzini, 2005). The NSSE also gathers descriptive data, including socio-demographic information about the participants. The instrument is structured primarily as a forced

choice, Likert-scale instrument. Several different sized and labeled Likert-scales are used to gather participant responses (see Appendix A). It is typically administered via the web or in paper format to randomly sampled freshman and senior students. Nearly 300,000 students attending 587 U.S. four-year colleges and universities completed NSSE in spring 2007 (NSSE, 2007).

Hu and Kuh (2002) and Kuh (2004) state that the NSSE was deliberately designed to satisfy the criteria that promote validity in self-reports. Many of the items that appear in the NSSE inventory have been adapted from other undergraduate surveys, including Indiana University's College Student Experiences Questionnaire (CSEQ) (Kuh, Vesper, Connolly, & Pace, 1997; Pace, 1984, 1990) and UCLA's Cooperative Institutional Research Program (CIRP) (Astin, 1993a; Sax, Astin, Korn & Mahoney, 1997). "The Design Team that developed the NSSE instrument devoted considerable time during 1998 and 1999 making certain the items on the survey were clearly worded, well-defined, and had high face and content validity" (Kuh, 2004, p.5).

Table 2. Internal Consistency of NSSE Benchmarks

NSSE Benchmarks	Cronbach's Alpha
Level of Academic Challenge	0.70
Active and Collaborative Learning	0.65
Student-Faculty Interaction	0.71
Enriching Educational Experiences	0.62
Supportive Campus Environment	0.77

The psychometric properties of NSSE have been extensively tested and reported in various sources (Kuh, 2004; Kuh, Hayek, Carini, Oiumet, Gonyea & Kennedy, 2001; Oiumet, et. al., 2001). These tests have been continually administered to the NSSE each year since initial field tests in 1999 (Kuh, 2004). Based on random samples of over

130,000 freshmen participants from the 2007 NSSE survey administration, Cronbach's Alpha for each of the NSSE benchmarks is listed above in Table 2 (NSSE, 2008b). The table indicates that the items comprising each of the benchmarks are found to measure a single unidimensional latent construct at an acceptable level; although for ACL and EEE this is only marginally the case. Table 3 shows the intercorrelations of each of the 2007 benchmarks using the same set of random samples (NSSE, 2008b). All of the benchmarks are highly correlated with each other.

Table 3. Intercorrelations

	LAC	ACL	SFI	EEE	SCE
LAC	1.00	—	—	—	—
ACL	.484***	1.00	—	—	—
SFI	.463***	.601***	1.00	—	—
EEE	.404***	.490***	.463***	1.00	—
SCE	.368***	.353***	.407***	.336***	1.00

\*\*\*  $p \leq .001$

In recognition that psychometric analysis cannot demonstrate “whether students are interpreting the items consistently and whether their responses accurately represent the behaviors or perceptions the survey designers intended” (p.2), Ouimet and colleagues (2001) conducted a large scale series of focus groups to further examine the validity and reliability of the NSSE. The results of these focus groups were used to increase the clarity and measurement precision of the survey (Ouimet, et. al., 2001). In sum, these and other tests demonstrate that the items on NSSE are both valid and reliable, and have acceptable kurtosis and skewness indicators (Kuh, 2004).

### Hypotheses

The main question addressed in this study is: Do higher levels of freshman engagement, as measured by the NSSE, increase the likelihood of longterm persistence at a single institution of higher education? When looking at longterm persistence in this manner it is necessary to compare a number of different student groups. These groups are: non-persisters, temporary persisters, and longterm persisters.

Three comparisons are used to explore the relationship between the NSSE's measure of engagement and longterm persistence. The principle analysis is between non-persisters and longterm persisters. However, two further analyses are useful for illustrating what is occurring along the continuum of persistence. These are the comparisons between non-persisters and temporary persisters, and temporary persisters and longterm persisters. Answers are generated through the testing of the following research hypotheses:

H1: Students with higher index scores on the NSSE benchmarks will be more likely to be longterm persisters than non-persisters.

H2: Students with higher index scores on the NSSE benchmarks are more likely to be temporarily persisters than non-persisters.

H3: Students with higher index scores on the NSSE benchmarks are more likely to be longterm persisters than temporary persisters.

Dependent on findings of significance in the tests of the above hypotheses three further research hypotheses are considered:

H4: The significant effects observed in H1 will remain after students' ACT scores, mother's education, father's education, gender and living arrangements are controlled for.

H5: The significant effects observed in H2 will remain after students' ACT scores, mother's education, father's education, gender and living arrangements are controlled for.

H6: The significant effects observed in H3 will remain after students' ACT scores, mother's education, father's education, gender and living arrangements are controlled for.

### Data Analysis Strategies

In order to answer the research question posed by this study and test the above research hypotheses the following strategies are used to analyze the data.

First, to test representativeness, a comparison of the demographic characteristics in Table 1 is made between the present study's sample and the entire 2006-2007 cohort of first-time, full-time students at the institution. Two-tailed, single sample *t*-tests compare the groups on the basis of freshman GPA, ACT scores and age. Next z-tests for proportions compare the groups on the remaining socio-demographic variables and rates of persistence. Unfortunately, due to differing classification systems used by the institution and the NSSE, the groups are unable to be compared by major area of study. A series of descriptive statistics are also calculated that provide information on average group responses (non-persisters, temporary persisters and longterm persisters) to each of the five benchmarks of the NSSE tool.

A total of twenty-four (6.6%) surveys contained one or two points of missing data relevant to the IV of the study. Tabachnick and Fidell (2001) caution researchers to look for patterns in the missing data as the existence of patterns may cause problems with the

ability to generalize the results. To check for patterns the surveys containing missing items were examined on the grounds of the DV and IV's of this study. No patterns were found. Index means were deemed to be the most appropriate substitutions for the missing values (O'Rourke, 2003). Each of the variables were tested for normality and found to have acceptable ( $>-1$  to  $<1$ ) skewness and kurtosis. An exception was the EEE benchmark which had a skewness of 1.091 and a kurtosis of 2.381. However, this is to be expected given the homogeneity of the institution and is not considered to constitute a problem in the normality of sample data.

In order to control for multicollinearity a principal components factorial analysis is conducted for the five benchmarks of the NSSE being used in the study. This analysis is used to inform the structure for the model used for the logistic regression analysis that follows (Garson, 2008). To simplify the latent structures of any factors both orthogonal (varimax) and oblique (direct oblimin) rotation methods are considered. Rotation simplifies the interpretation of the analysis because, after rotation, each original variable tends to be principally associated with only one of the factors, and each factor represents only a small number of variables (Abdi, 2003). The results of this analysis and the accompanying narrative are found in Chapter 4.

The research hypotheses are tested through the use of a logistic regression analysis. The use of regression analysis to measure the impact of engagement on college outcomes such as persistence is well established (Kuh et. al., 2007a, 2007b & 2008). Cohen, Cohen, West and Aiken (2003) recommend the use of regression methods in the behavioral sciences to test hypotheses that are informed by theory, previous research, or simply scientific hunches. They note the robustness of this analytic technique in regard

to the unconstrained nature of the DV and its relationship to the IV's (Cohen et. al., 2003).

In this study there are three possible groups in the outcome variable: non-persistence; temporary persistence (to only the sophomore year); and, longterm persistence (to the junior year). Each of the groups is coded in a way that makes group membership distinct. That is, participants can only belong to one of the three groups. Two analytic techniques offer potentially viable frameworks through which to conduct the investigation of the research hypotheses and seek an answer to the research question. One is ordinal logistic regression (OLR). The other is multinomial or polytomous logistic regression (MLR).

OLR is used when the DV is ordinal and the independents are either categorical factors or continuous covariates (David, n.d.). The data for this research satisfies this condition. OLR treats the categories comprising the DV as reflecting an underlying continuum of steps with movement from one step to another indicating the passing through a threshold. Thresholds need not be equally spaced, since only ordinality is assumed (Cohen, et. al., 2003). Non-persistence through to persistence to the junior year constitutes a logical progression. However, OLR requires that the effect of the independents is the same for each level of the dependent. This is referred to as the assumption of proportional odds and should not be taken for granted (David, n.d.). The test of parallel lines or score test can be used to see if this assumption is satisfied. This test compares the fit of a model in which a single slope is applied to the whole continuum with an unconstrained model that permits differing slopes for cases either side of a threshold (Cohen et. al., 2003). The null hypothesis in testing the assumption of

proportional odds is that the predictors will have the same impact on crossing all thresholds, that is  $\beta_1 = \beta_2$  (Cohen et. al., 2003).

The second option is an MLR analysis which can be used to examine an outcome variable consisting of non-ordered responses or in situations where the assumption of proportional odds is not satisfied (Cohen, et. al., 2003). The outcome variables for this research can clearly be categorized in an ascending order that reflects the increasing length of time students persist with their education at the college. Therefore, the deciding factor between using OLR or MLR rests on the supporting or rejecting of the above null hypothesis by the test for parallel lines.

Statistical Package for the Social Sciences (SPSS) was used to run a Chi-squared score test to test the hypothesis  $\beta_1 = \beta_2$ . The assumption is not violated if this test returns a finding of non-significance ( $p > 0.05$ ), meaning there is no significant difference between the model where the regression lines are constrained to be parallel across thresholds compared to the model where the regression lines are allowed to be estimated without a parallelism constraint (David, n.d.). As membership in the outcome group longterm persistence is more probable, a complementary log-log link function, recommended when higher categories of the DV are more probable than lower categories, is used in estimating the model (David, n.d.).

The score test for proportional odds returned a Chi-squared value of 33.501 ( $df = 7$ ) and a p-level of 0.000. Given that the p-level is less than 0.05, the proportional odds assumption is not justified and the null hypothesis that the regression lines run parallel across thresholds can be rejected. David (n.d.) states that if the test of parallel leads to a rejecting of the null hypothesis, the researcher may combine categories until parallelism

is achieved, or may switch to MLR. For the purpose of this research the latter option is taken.

In MLR one of the groups from the outcome variable is chosen to function as the baseline. This decision should not be arbitrary, but rather should reflect the nature of the research question. As the research question is exploring the relationship between student level of engagement and their longterm persistence both the non-persistence group and longterm persistence group offer reasonable options. As all three sets of comparisons that can be generated are of interest in this study it was decided to use non-persistence as the baseline group for the SPSS run analysis, and calculate the remaining comparison by hand. Data from all three groups ( $g$ ) are entered into an initial MLR analysis over the course of which two distinct logistic regression functions ( $g - 1$ ), with the same  $k$  predictors, are computed (Cohen et. al., 2003). The first contrasts the group who persisted to only their sophomore year with the non-persistence group; the second contrasts the group who persisted to their junior year with the non-persistence group. The final contrast, calculated using longterm persistence as the baseline, is between the temporary sophomore persisters and the longterm persisters.

For ease of interpretation odds ratios ( $e^{\beta}$ ) are used in the reporting of results. For continuous variables, odds ratios measure the multiplicative effect for a one-unit change in an explanatory variable. For dichotomous variables, odds ratios measure the effect of being in one category compared to another. The odds ratio of a coefficient indicates how the chance of the outcome falling in the comparison group compared to the chance of the outcome falling in the baseline group changes with the variable in question (UCLA, n.d.). An odds ratio  $> 1$  indicates that the chance of the outcome falling in the

comparison group relative to the chance of the outcome falling in the baseline group increases as the variable in question increases (UCLA, n.d.). An odds ratio  $< 1$  indicates that the chance of the outcome falling in the comparison group relative to the chance of the outcome falling in the referent baseline group decreases as the variable increases (UCLA, n.d.). An odds ratio of 1.0 indicates no effect. Odds ratios can be interpreted in terms of percentage change through the simple transformation:  $(e^{\beta} - 1) \times 100$ .

Cohen et. al. (2003) warn that if differences in scaling in the predictor variables are ignored when interpreting results then there is a risk of misinterpreting smaller regression coefficients that result from prediction from variables with larger ranges as indicating weaker predictions. To overcome this Pampel (2000) recommends that researchers standardize the predictors by converting them to z-scores and estimate the unstandardized logistic regression. “The resulting coefficients give the change in the logit for a one standard deviation change in the predictors” (Cohen et. al., 2003, p.512). As a range of differing predictor variable scales are used in this research this recommendation is followed and predictors are converted to standardized scores (z-scores) before conducting the analysis.

The above analyses should provide rich and meaningful results that can be used to address each of the proposed hypotheses and in doing so answer the guiding research question of this study.

## CHAPTER FOUR

### RESULTS

The purpose of this study is to explore how informative the NSSE measures of student engagement are in relation to predicting the longterm persistence of freshman students at a single institution of higher education. The NSSE measures of engagement consist of five benchmarks that represent good educational practices empirically linked with desirable educational outcomes. These benchmarks are: LAC; ACL; SFI; EEE; and, SCE. The longterm persistence of the participants is determined by their continued full-time enrollment status at the institution from their commencement in the freshmen year through to the junior year of study. The NSSE measure of engagement and a series of background characteristics are used to predict the likelihood of students meeting this criterion compared with the likelihood of being either a non-persisters or temporary persisters. Non-persisting students are those members of the sample who left the institution before the commencement of their sophomore year. Temporary persisting students are those freshman participants who re-enrolled in a full-time status for their sophomore year, but not their junior year. An additional comparison is also made between temporary persisters and non-persisters.

SPSS is used to conduct a factor analysis and a MLR analysis. This second analysis, MLR, is designed to answer the specific research hypotheses and in doing so provide an answer to the guiding research question of this study. The conventional level of significance is set at  $p \leq .05$  for all tests. This provides reasonable security against both Type I and Type II errors.

The following chapter presents the results of the data analysis strategies outlined in the methodology section of this paper. Results are given in tabulated form with accompanying narratives. Statistical evidence for the decision to retain or reject each of the six research hypotheses is also provided.

### Representativeness Analysis

In order to establish the limitations of the findings of the study in reference to the intended population, it is necessary to check the representativeness of the sample. Table 4 shows the results of the two-tailed, single sample t-tests comparing the sample (N=362) and the 2006-2007 cohort of first-time full-time freshman (N=1942) on the grounds of ACT scores, first year GPA and age. Support for hypotheses of no difference is required for all the tests of representativeness if the sample characteristic is to be considered an accurate reflection of the characteristic in the entire cohort. For the three t-tests this means that the sample means ( $\bar{x}$ ) will not be significantly different from the population means ( $\mu$ ) in situations where the sample is representative.

Table 4. t-tests for representativeness

Characteristic	(df)	t-value
ACT scores	361	0.00
GPA	361	-1.87
Age	361	6.55***

\*\*\* $p \leq 0.001$  (Two-tailed)

The results of the three t-tests indicate that the sample is representative of the 2006-2007 cohort of first-time, full-time freshman at the institution on the grounds of ACT scores and first-year accumulative GPA. The results for Age signify that the average age of sample is significantly older than that of the cohort as a whole. However,

the institutional reported average age is based on students' ages at the time of enrollment (beginning of the 2006 fall semester), while the ages of the sample are recorded approximately six months later at the beginning of the spring 2007 semester. As the difference in average age between the sample and cohort is only 0.32 years, it is reasonable to assume that the disparity may be accounted for by the time lapse between recordings. Therefore, the sample is considered to be representative of the 2006-2007 cohort on the grounds of ACT scores, GPA and age.

Table 5 provides the tabulated results for the z-tests for proportions for the remaining characteristics being used to test representativeness. If the z-score for a characteristic exceeds the two-tailed 5% cutoff of  $\pm 1.96$ , the hypothesis that the sample and population are equivalent in this characteristic is rejected.

Table 5. z-tests for proportions

Characteristic	z-score
Living on Campus	0.17
White Students	3.248***
Female Students	4.342***
Male Students	4.342***
Sophomore retention	4.565***
Junior retention	3.218***

\*\*\* $p \leq 0.001$

The results of the z-tests for proportions indicate that the sample adequately represents the cohort with regards to the proportion of students living on campus during their freshman year. However, for the remaining characteristics the z-scores exceed the two-tailed 5% cutoff of  $\pm 1.96$ . This means that these characteristics are not represented in the same proportions in the sample and the 2006-2007 cohort of first-time, full-time freshman. The sample includes a higher proportion of White students than are found in the original cohort and is disproportional with regard to gender. The proportions of

retained students are also significantly higher in the sample. As Tinto (1993) asserts and Hicks and Lerer (2003) note in their study, however, most students who are going to depart do so in the first semester before the NSSE is administered. This means that the noted higher rates of persistence are to be expected and may not indicate a lack of representativeness. The lack of proportionality of gender will, however, need to be considered in interpreting the results of the MLR analysis.

### Descriptive Statistics of Group Responses

The mean responses to the five NSSE benchmarks by the three outcome groups are reported for completeness in Table 6 with accompanying standard deviations in parentheses below. The results provide a quick glance at what is occurring as the level of persistence increases.

Table 6. Average group responses to NSSE benchmarks

	LAC	ACL	SFI	EEE	SCE
Non-persisters (N=61)	47.46 (12.16)	37.78 (13.82)	25.18 (11.97)	19.73 (10.79)	48.89 (17.70)
Temporary Persisters (N=49)	51.02 (14.60)	40.84 (14.39)	29.65 (13.04)	21.99 (12.98)	57.18 (18.24)
Longterm Persisters (N=252)	53.43 (11.04)	42.20 (13.85)	30.44 (14.95)	23.24 (10.10)	57.42 (15.83)

Range = 1 to 100

What Table 6 highlights is a consistent pattern of increase in the mean responses to the five NSSE benchmarks as the level of persistence increases. One-tailed independent t-tests show that the mean index scores for non-persister group are significantly ( $p \leq 0.05$ ) different from the mean index scores for both the temporary and longterm persisters on all five benchmarks. However, the mean index scores for the

temporary persister group and longterm persister group only differ significantly ( $p \leq 0.05$ ) on the LAC benchmark.

### Factorial Analysis

Multicollinearity is a problem that can occur in data sets in which one or more of the IV's are highly correlated with other IV's in the regression equation. The existence of this phenomenon can lead to misleading results (Cohen et. al, 2003). According to Cohen et. al. (2003) a means of testing for the presence of multicollinearity is through performing simple univariate analyses in which the outcome is regressed separately on each of the predictor variables. These results can then be compared with the results of the full regression analysis in which all predictor variables of interest are used (Cohen et. al., 2003). "Large, unexpected changes in direction and magnitude of these coefficients suggest a substantial influence of multicollinearity" (p.425). The results of these tests for the five benchmarks of the NSSE suggested the possible presence of multicollinearity within this data set.

Garson (2009) recommends the use of factor analysis to create a set of factors to be treated as uncorrelated variables as one approach to handling multicollinearity in regression analyses. Based on this recommendation a principle components factor analysis is conducted. The eigenvalue  $>1$  rule is used to discern the number of latent factors. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy is (0.794). Kaiser (1978, cited in Field, 2005) recommends accepting values above 0.5 as adequate. Field (2005) further suggests that values between 0.7 and 0.8 are good.

The completed analysis revealed that the five NSSE benchmarks are loading on a single variable and so no rotation was performed. This finding supports the theoretical assertion that the benchmarks form a measure of the construct student engagement. Table 7 shows the results of this un-rotated factor extraction. According to Field (2005), by Kasier's criterion only a single factor should be extracted. However, when the sample size exceeds 250 Kasier's criterion is accurate when the average communality is greater than 0.6. The average communality is 0.5148 meaning that Kasier's rule may not be accurate (Field, 2005). Table 8 shows the communalities generated by the analysis.

Table 7. Un-rotated Factor Extraction

Component	Initial Eigenvalues	
	Total	% of Variance Explained
1	2.574	51.480
2	.725	14.506
3	.689	13.777
4	.577	11.538
5	.435	8.698

Table 8. Communalities

	Initial	Extraction
LAC	1.000	.475
ACL	1.000	.582
SFI	1.000	.624
EEE	1.000	.472
SCE	1.000	.421

Extraction Method: Principle Component

Additionally Thompson (2004), cautions against using only the eigenvalue  $>1$  method in determining the number of factors that should be extracted arguing that the final decision should also be informed by careful examination by the researcher of the component variables and theory. Field (2005) suggests that, if the sample size is larger than 300, an examination of a scree plot may be helpful in discerning the number of factors to retain. As the sample size is greater than 300 and the average communalities

was less than 0.6, this suggestion is followed. SPSS is used to generate a scree plot for the data.

The plot (Appendix C) indicates a possible second drop after the point of inflexion on the curve which would be indicative of a second factor. Considering this, a second analysis is run specifying SPSS to extract two factors (Field, 2005). Table 9 shows the resulting un-rotated component matrix of this second factor analysis.

Table 9. Component Matrix: Two Factors

	Components	
	1	2
LAC	.689	-.285
ACL	.763	-.245
SFI	.790	.112
EEE	.687	-.247
SCE	.649	.715

Extraction Method: Principal Component

When two factors are specified, all of the five NSSE benchmarks continue to load heavily on the first factor. However, SCE cross-loads on both factors, with the heavier loading being on factor two. This finding calls for careful consideration. Often when a variable is found to cross-load the recommendation is to remove it from the analysis (Garson, 2009), however, as SCE is already a factored variable and represents a key component of this study this is not a suitable solution.

According to the creator of the NSSE, engagement is a measure of both the amount of time and effort students put into their studies and other educationally purposeful activities, and also of how institutions of education deploy their resources and organize their curriculums, other learning opportunities, and support services to induce students to participate in activities that lead to desired outcomes such as persistence (Kuh, 2001; Kuh et. al., 2006). Taking this definition into consideration, the forty-two

component items (Appendix B) that comprise the benchmarks are scrutinized with the aim of informing the decision to retain one or two factors.

The questions in the benchmarks LAC, ACL, SFI and EEE tend to require respondents to report on the amount to which they are engaged with a specified concrete behavior. There are, however, a few notable exceptions. In the LAC benchmark respondents are asked their opinion of how much their course work emphasizes higher order thinking in four questions. Also, in this benchmark another question asks respondents to indicate the extent to which their institution emphasizes spending significant amounts of time studying and on academic work. Another exception is in the EEE benchmark where respondents are asked to indicate in one question the extent to which their institution encourages contact with students from differing economic, social and racial or ethnic backgrounds. Overall, however, the majority (30 out of 36) of questions in these four benchmarks are concerned with the reporting of the quantity of a respondent's involvement in concrete behaviors linked to engagement. These behaviors align with both aspects of Kuh's definition of engagement as some of the measured actions are instigated by the institution and others by the students.

In contrast all (6) of the questions in the SCE benchmark ask respondents to report on less concrete or abstract measures consisting of individual perceptions of the institution and its personnel. The items are split equally between measures of the quality of relationships respondents feel they have with institutional personnel and opinions on the extent to which the respondents believe their institution offers them support. This benchmark is more summative in nature than the other four and aligns itself solely with the second part of Kuh's definition of engagement. Distinct from the other benchmarks,

it captures the respondent's internalized perception of whether they are valued by the institution.

Applying Rousseau's (1995) theory of psychological contracts to students at institutes of higher education, Kuh and colleagues (2006) suggest that students have certain implicit beliefs or expectations about the responsibilities of faculty and staff. Breaching of these beliefs can lead students to lose trust in the institution, which in turn can be damaging to the student's academic performance and social adjustment to college life (Kuh et. al., 2006). Yorke and Longden (2004) also consider that, in regard to student success and persistence, much depends on the student's perception of their experience of higher education. Hicks and Lerer (2003) see the SCE benchmark more than the other four benchmarks constitutes a measure of social engagement. Sense of belonging research (Hausmann et. al., 2007; Ostrove & Long, 2007; Passcarella et. al., 2004) also strongly suggests that the questions of the SCE benchmark measure something different from the more action focused, concrete measures of the other benchmarks.

Based on these observations it is decided to specify two distinct measures of engagement for the MLR analysis. The first measure, coded Engage1, is considered to be chiefly a measure of actions. That is, what students and institutions do in terms of engaging educational practices. It consists of the sum of a participant's index scores on the LAC, ACL, SFI and EEE benchmarks, after they have been standardized into z-scores. The second measure, coded Engage2, is considered to capture the individuals internalized valuing of the institution and their sense of belonging. It consists of a participant's standardized index score on the SCE benchmark.

### Regression Analysis

The guiding question of this study and the research hypotheses are examined through the use of a regression analysis. As discussed in the data analysis section of chapter three, MLR provides the most appropriate technique to conduct this investigation. Three separate blocks of IV's are entered in the MLR analysis. The first block, Model 1, consists of the combined measures of the LAC, ACL, SFI and EEE benchmarks, variable Engage1. This variable is entered first on the grounds that “[w]hat students **do** during college counts more in terms of desired outcomes than who they are or even where they go to college” (Kuh, 2004, p.1). The next block, Model 2, consists of the remaining measure of engagement, variable Engage2. The third block, which completes Model 3, contains the background variables discussed in chapter three. This block is used to test research hypotheses H4, H5 and H6.

- Model 1 = Engage1
- Model 2 = Model 1 + SCE
- Model 3 = Model 2 + Background Variables

Table 10 contains the results of the regression analysis with the three blocks of variables entered. Odds ratios ( $e^{\beta}$ ) are used for comparisons. The accompanying lower and upper bounds of 95% confidence intervals are displayed below each ratio. To manage the differing scales used for the IV's the predictors are standardized. This means that the resulting coefficients give the change in the outcome variable for a one standard deviation change in the predictor. The results for Model 1 and Model 2 are used to test research hypotheses H1, H2 and H3. There are three contrasts: (1) Non-persisters vs.

Temporary Persisters; (2) Temporary Persister vs. Longterm Persisters; and, (3) Non-persisters vs. Longterm Persisters.

In Model 1 and Model 2, the comparisons that use non-persistence as the reference category with odds ratios greater than 1 indicate that the likelihood of being either a temporary persister or a longterm persister compared to being a non-persister is increased with higher levels of engagement, as measured by student scores on the NSSE benchmarks. Model 1 shows that a one standard deviation increase on respondents' scores on the Engage1 variable increases the likelihood of students being a temporary persister as opposed to a non-persister by 14.3% ( $p \leq 0.05$ ). The odds of being a longterm persister compared to a non-persister are increased by 20.6% ( $p \leq 0.001$ ).

When respondents' scores on the SCE benchmark are entered, Model 2, the predictive power of the first measure of engagement is lessened. The variable Engage1 loses significance for predicting group membership between non-persister and temporary persisters. In comparing longterm persister with non-persister however, it continues to be significant. A one standard deviation increase in students' scores on the benchmarks of Engage1 improves the odds of persisting to the junior year of college by 13.9% ( $p \leq 0.05$ ). Higher scores in Engage2 increase the likelihood of both temporary and longterm persistence compared to non-persistence by 54.4% ( $p \leq 0.05$ ) and 43.5% ( $p \leq 0.05$ ) respectively.

Table 10. MLR analysis predicting level of persistence

Variables	Model 1			Model 2			Model 3		
	Non-Persist vs. Temp Persist	Long Persist vs. Temp Persist <sup>a</sup>	Non-Persist vs. Long Persist	Non-Persist vs. Temp Persist	Long Persist vs. Temp Persist <sup>a</sup>	Non-Persist vs. Long Persist	Non-Persist vs. Temp Persist	Long Persist vs. Temp Persist <sup>a</sup>	Non-Persist vs. Long Persist
	Engage1	1.14* [1.02,1.28]	0.95 [0.87,1.04]	1.21*** [1.10,1.32]	1.07 [0.94,1.21]	0.94 [0.87,1.04]	1.14* [1.03,1.26]	1.07 [0.94,1.22]	0.94 [0.85,1.04]
Engage2	—	—	—	1.54* [1.07,2.23]	1.08 [0.80,1.45]	1.44* [1.09,1.89]	1.44 [0.99,2.10]	1.01 [0.74,1.38]	1.43* [1.08,1.89]
FathrEdu	—	—	—	—	—	—	1.12 [0.75,1.66]	1.22 [0.89,1.69]	0.92 [0.69,1.22]
MothrEdu	—	—	—	—	—	—	1.43 [0.97,2.12]	1.38 [0.99,1.92]	1.04 [0.78,1.37]
LiveNow	—	—	—	—	—	—	1.46* [1.02,1.82]	2.53* [1.20,5.32]	1.03 [0.59,1.80]
Gender	—	—	—	—	—	—	1.00 [0.52,1.92]	0.67 [0.39,1.15]	1.49 [0.91,2.42]
ACT	—	—	—	—	—	—	0.66* [0.47,0.94]	0.53*** [0.40,0.70]	1.25 [0.96,1.63]

\*p≤0.05 \*\*p≤0.01 \*\*\*p≤0.001 (One-tailed)

<sup>a</sup> Longterm persistence used as reference category

The comparisons between longterm persistence and temporary persistence in Model 1 and Model 2 use longterm persistence as the reference category. As odds ratios greater than one indicate an increased likelihood of being in the non-reference categories, for these comparisons odds ratios less than 1 would be indicative of an increased likelihood of being a longterm persister as the engagement variables increase. However, both Model 1 and Model 2 indicate that Engage1 and SCE are not significant for predicting group membership.

Using these results research hypotheses H1, H2 and H3 can be tested. The expected outcome stated by H1 is that students with higher index scores on the NSSE benchmarks will be more likely to be longterm persisters than non-persisters. The expected outcome stated by H2 is that students with higher index scores on the NSSE benchmarks are more likely to be temporarily persisters than non-persisters. The expected outcome stated by H3 is that students with higher index scores on the NSSE benchmarks are more likely to be longterm persisters than temporary persisters. As two measures of the impact of the NSSE benchmarks are used in the MLR analysis support for these hypotheses must be interpreted accordingly.

Under Model 1 both H1 and H2 are confirmed for the Engage1 variable. However, when the fifth benchmark SCE is regressed on persistence, support for H1 remains but support for H2 becomes conditional. That is, support for H2 only exists for the SCE benchmark; higher scores on the remaining four benchmarks do not increase the likelihood of students temporarily persisting. On these grounds H1 is confirmed and should therefore be retained. H2 is partially confirmed and so will be retained to allow

further testing. Support for H3 however, is not found under either model and so H3 is rejected.

As stated in the data analysis section of chapter three, dependent on findings of significance in the tests of the above hypotheses three further research hypotheses would be considered. H4 expresses the expectation that significant effects observed in H1 will remain after students' ACT scores, mother's education, father's education, gender and living arrangements are controlled for. Likewise, H5 expresses that the significant effects observed in H2 will remain after controlling for the same background variables. As the need to test H6 is dependent on finding support for H3, this hypothesis does not need to be tested. However, in the interest of examining persistence during the sophomore year the results of adding background variables for the comparison of longterm persisters versus temporary persisters are still reported in Table 10. In order to test these hypotheses the third block of variables is added to the MLR analysis and a final, third model is generated. As with Model 1 and 2, Table 10 displays the odds ratios ( $e^{\beta}$ ) for Model 3, with the lower and upper bounds of the 95% confidence interval recorded below each of the ratios.

The background variables added in Model 3 include a measure of the level of education attained by respondents' fathers (FathrEdu) and mothers (MothrEdu), whether respondents live in college accommodation (LiveNow), the respondents' gender (Gender), and their ACT scores (ACT). Table 11 and 12 (Appendix D) show frequency counts and descriptive statistics for these variables.

For the comparison between longterm persisters and non-persisters both engagement variables continue to be significant in Model 3 at the same level ( $p \leq 0.05$ ) as

they do in Model 2. Students with higher scores on the four benchmarks of Engage1 are 14.1% more likely (per one standard deviation increase) to persist with their education at the institution into the junior year of study than leave the institution at the end of their freshman year. A one standard deviation increase on the SCE benchmark produces a 42.3% increase in this likelihood. All of the background variables in the comparison of longterm persisters with non-persisters fail to prove to be significant predictors. The maintaining of significance for all five of the NSSE benchmarks from Model 2 to Model 3 supports the retaining of research hypothesis H4.

Looking at temporary persistence vs. non-persistence in the tabulated results above, Engage2 has lost its predictive power as a result of the added background variables. Of these only two, LiveNow and ACT, are significant predictors at  $p \leq 0.05$ . LiveNow is a dichotomous variable the coding of which makes living off campus the comparison group. This means that the odds ratio greater than 1 for LiveNow indicates that living on campus during the freshman year increases the odds of being a temporary persister by 46.4% compared to being a non-persister. Interestingly, the odds ratio for ACT scores is less than 1. This suggests that, for this sample, each one standard deviation increase in ACT test scores reduces the likelihood of being a temporary persister compared to a non-persister by 33.9%.

Addressing the fifth research hypothesis on the basis of these results leads to a failure to support the assertion that higher scores on the five NSSE benchmarks will increase the likelihood of temporary persistence over non-persistence irrespective of background variables. H5 is therefore rejected.

Research hypothesis H6 has already been shown to be unnecessary due to the findings from Model 1 and Model 2. However, exploring the longterm persistence vs. temporary persistence comparison to check for significance among the background variables entered in Model 3 reveals two findings of note. The odds ratio for LiveNow indicates that living on campus during the freshman year increases the odds of being a temporary persister compared to a longterm persister by 152.5%. The confidence interval is very large here (1.198 to 5.323), however, meaning caution needs to be taken in interpreting this finding. The odds ratio for the variable measuring ACT suggests the likelihood of being a longterm persister as opposed to a temporary persister is increased by 47.2% per standard deviation increase in ACT scores.

## CHAPTER FIVE

## DISCUSSION AND CONCLUSION

Ex post facto or causal comparative in design, this study compared the likelihood of first-time, full-time freshmen being non-persisters, temporary persisters, or longterm persisters on the basis of index scores on the five NSSE benchmarks of engagement and a range of background variables. MLR was used to regress a combined measure of four of the NSSE benchmarks (Engage1) and SCE on the level of student persistence. In previous chapters, the research questions were stated, pertinent literature was reviewed, and the procedure and methodology of the study were described. Chapter four presented results on the representativeness of the sample, provided comparative descriptive statistics, explored the relationship between the independent variables and the dependent variables, and outlined the results of the hypothesis testing.

This final chapter begins with a review of the background and importance of this study. This is followed by an examination of the findings and their implications in relation to existing research on student engagement and student persistence. Finally, the chapter concludes with a discussion of recommendations for future research.

Overview of the Study

Existing studies have examined the roll of engagement, as measured by the NSSE, in promoting student persistence. These papers have mainly concentrated on persistence from the freshman to sophomore year. A study by Kuh et. al. (2006) did look at a relationship between engagement and graduation. However, this study did not use the

individual student as its unit of measurement. The general consensus of research to date is that higher levels of engagement will improve students' success in important areas of the college experience and increase the likelihood of persistence.

The persistence of students towards degree completion is important for numerous stakeholders. For students and potential students a higher degree of educational attainment is linked to improvements in the quality of life available to them (Day & Newburger, 2002; U.S. Census, 2004). Also, integration into the academic and social environments of college life aid in personal and cognitive development, and improve the ability of students to operate effectively in an increasingly diverse world (Kuh et. al., 2006; Kuh et. al., 2007a; Pascarella & Terenzini, 1991 & 2005; Tinto, 1993). A trickledown effect flows from these benefits leading to improvements for the families and communities which graduating students are part of. Studies of the struggles faced by children of non-degree attaining parents demonstrate, by implication, the potential of some of this effect.

Governments want higher education to be as effective and efficient as possible. Yorke and Longden (2004) note this is “not only because of labor market concerns but also because they have to account to their publics for the investments that they have made on their publics' behalf” (p.1). Additionally, a more highly educated public results in: increased tax revenues, greater productivity, increased consumption, increased workforce flexibility, reduced crime rates, and decreased reliance on government financial support (Institute for Higher Education Policy, 1988; Watts, 2001). Retaining the greatest percentage of students is vital for the functioning of institutions of higher education as well. Losing students prior to their scheduled time of graduation can create fiscal

problems for colleges that can result in budgetary cuts leading to loss of faculty and utilities, and increased snowballing recruitment costs (Habley & McClabahan, 2004). Additionally, institutions with high rates of student departure can suffer further because of the negative public opinion this generates (Yorke and Longden, 2004).

Due to these and other factors institutions are under mounting pressure to find ways to improve the graduation rates of matriculating students. This has been further complicated by increased diversity in the backgrounds and abilities of those seeking to attend college (Tinto, 2004; Toutkoushian, 2001). Reviews of national retention rates show that, despite the establishment of numerous programs, there has been little improvement over the last few decades (ACT, 2007; Habley & McClanahan, 2004; NCES, 2008). Key researchers in the field of persistence (Astin, 1993a; Kuh, 2001-2002; Tinto, 1990 & 2007; Yorke & Longden, 2004) argue that what is needed is a change in focus. Such change involves a move away from trying to address the particular reasons behind student departure through numerous programs, towards a more holistic restructuring of institutional culture focused on the principles of quality education.

A growing body of evidence suggests that one of the most important ways to achieve this change in focus involves institutions encouraging and supporting students to increase their involvement with engaging educational practices that have been linked with beneficial outcomes. If these practices can be shown to be beneficial in aiding longterm persistence then, based on a review of literature, this paper posits that the use of these practices as a means of improving persistence is an attractive option as it is sensitive to both institutional constraints and to the background differences among

students (Ahlfeldt, Mehta & Sellnow, 2005; Cruce et. al., 2006; Kuh et. al., 2007a, 2007b & 2008; Pascarella & Terenzini, 2005, Tinto, 1997).

Using an established and validated measure of engagement for the higher education setting, the NSSE, this study aimed to further explore this promising notion through an investigation of whether higher levels of freshman engagement increased the likelihood of longterm persistence at a single institution. For this study, persistence is cast as a continuum made up of three distinct groups of students: non-persisters (those students who left before the sophomore year), temporary persisters (those students who reenrolled at the institution in a full-time status in the sophomore year but not the junior year), and longterm persisters (those students who stayed enrolled at the institution in a full time status through to the junior year). It was considered that using this triad, as opposed to the usual dichotomy, would provide a more informative picture of the factors that are influencing persistence at different stages of college.

Six hypotheses were used in order to provide the answer to the guiding research question:

H1: Students with higher index scores on the NSSE benchmarks will be more likely to be longterm persisters than non-persisters.

H2: Students with higher index scores on the NSSE benchmarks are more likely to be temporarily persisters than non-persisters.

H3: Students with higher index scores on the NSSE benchmarks are more likely to be longterm persisters than temporary persisters.

H4: The significant effects observed in H1 will remain after students' ACT scores, mother's education, father's education, gender and living arrangements are controlled for.

H5: The significant effects observed in H2 will remain after students' ACT scores, mother's education, father's education, gender and living arrangements are controlled for.

H6: The significant effects observed in H3 will remain after students' ACT scores, mother's education, father's education, gender and living arrangements are controlled for.

As there is no direct manipulation of the IV's due to the design of the study, the inclusion of the background variables in H4, H5 and H6 helps to control for other influences on persistence outside the engagement factors of interest. The use of first-time, full-time freshmen helps to control further confounding variables for which there was insufficient data for effective measurement.

#### Implications and Findings of the Study

The testing of the above hypotheses in chapter four was accomplished through an MLR analysis. Ultimately the answer to the guiding research questions resides in the retaining or rejecting of H4. As argued above, however, H5 and H6 are also important for understanding longterm persistence. The initial three hypotheses were included due to the exploratory nature of the research. For these reasons the focus of the following discussion mainly revolves around the findings generated for H4, H5 and H6. At the outset, however, it is important to look at the results from the tests for representativeness.

The sample in this study was compared to the 2006-2007 cohort of first-time, full-time freshmen on the grounds of average freshman GPA, ACT scores, age, race (White), living situations (in college accommodation or not), gender, as well as rates of sophomore and junior persistence. After taking into account disparities that were the possible result of how the data for comparing the two groups was gathered, the sample was deemed to accurately reflect the cohort in all tested areas except for the proportion of White students and the breakdown of genders. These results mean that the results of the study may not be able to be generalized to non-White members of the student population or on the basis of gender. Also, although the differences in the proportions of persisting students in the sample and the original cohort can be explained, the explanation highlights that the non-persister group in the study is almost certainly not representative of all freshman non-persisters at the institution.

To reiterate, Tinto (1993) identifies that most freshmen non-persisters leave college during their first semester of study. So as not to violate the conditions of valid self-reports (Hu and Kuh, 2002; Kuh, 2004), however, the NSSE is not administered until the end of the year. This means that many non-persisters have already left and are therefore not able to be included in analysis. Hicks and Lerer (2003) note this limitation in their study which used portions of the NSSE to measure the impact of social integration on student persistence at a single institution. They consider that, in light of this, findings of significance would be more difficult to attain (Hicks & Lerer, 2003). This caveat needs to be considered in reviewing the results of the comparisons involving the non-persister group.

The first and fourth research hypotheses test the principle element of the guiding research question for this study: Do higher levels of freshman engagement, as measured by the NSSE, increase the likelihood of longterm persistence at a single institution of higher education? The results covered in chapter four indicate support for both H1 and H4. This support infers that students who are more highly engaged with the college experience at the end of the freshman year are more likely to persist at the same institution to at least their junior year of study than they are to not persist at all.

The finding carries important implications for institutions interested in improving student retention rates. Positively, in light of both the human and monetary constraints many institutions need to work under (Tinto, 1994), the finding indicates that frontloading the first-year is a feasible option. With engaging educational practices being shown in other studies to benefit a diverse range of students, with noted compensatory effects for the historically underserved (Kuh. et al., 2007b & 2008), the benefits of increasing the use of these practices in the freshman year are amplified. In order to be successful, however, Yorke's and Longden's (2004) warning needs to be heeded. Institutions need to commit resources to educate faculty on how to incorporate engaging practices into classroom situations and provide clear training in the duties of advising. Although this may constitute a short term strain on budgetary resources, this study indicates that over the longterm it will pay dividends.

Further support for the benefits of engagement is seen when it is considered that only the two engagement variables are found to be significant for predicting group membership in the comparison of longterm persisters with non-persisters. None of the background variables, associated in past research with student retention, contributed

significantly to the model. This echoes Kuh's (2004) affirmation that it is what students do once they are enrolled in college that matters the most in terms of whether they will experience success, over and above who they are. This generates hope that the actions institutions take can be impactful regardless of a range of student factors beyond the institution's control.

The above findings also lend support to the assertion by numerous educational researchers that persistence problems can be effectively addressed through a focus on improving campus culture and the quality of education offered (Astin, 1993a; Kuh, 2001-2002; Tinto, 1990 & 2007; Yorke & Longden, 2004). Furthermore, the predictive power of the SCE benchmark over and above the other measures of engagement highlights just how important working to improve campus culture is for retention efforts. The more students perceive the campus culture to be supportive and the more they feel they are a valued member of that culture, the more likely they are to be long term persisters compared to a non-persister. This statement is upheld by studies and commentaries on the importance of social integration and belongingness (Braxton, 2000; Braxton, et. al., 2000; Hausmann, 2007; Pascarella and Terenzini, 1980; Tinto, 1993; Yorke & Longden 2004). It also underscores Braxton's and Hirschy's (2004) notions of institutional commitment to student welfare, institutional integrity, and communal potential as essential aspects for the everyday practices of colleges.

It is important that institutions consider how these and other similar research findings can be applied to their campuses. Koljatic and Kuh (2001) note that, despite over two decades of calls for reform and mounting evidence of the need for change, there has been no appreciable improvement in the frequency with which the good educational

practices associated with engagement are being used. They urge that faculty members be willing to embrace the philosophy undergirding Chickering's and Gamson's (1987) principles. If this is to occur, however, institutions need to examine what their evaluation criteria for promotion, tenure and other staff rewards communicates to faculty members about what is truly valued and make adjustments accordingly (Chambers, 2008; Koljatic and Kuh, 2001).

Moving to address the other findings in the study, research hypotheses H2 and H5 are concerned with whether students with higher index scores on the combined Engage1 variable and the SCE benchmark will be more likely to be temporary persisters than they are to be non-persisters. Knowing what contributes to even the temporary persistence of students is useful to institutions interested in improving retention rates. Persistence data implies that the closer a student gets to their final two years of college the more likely it is that they will stay to graduation (ACT, 2007; Grandy, 1998; Habley & McClanahan, 2004; NCES, 2008). The temporary retention of students may not be ideal, but in most cases it is a step in the right direction.

Examination of the results, shown in Table 10, leads to a rejecting of the fifth research hypothesis at the  $p \leq 0.05$  level. However, as noted in chapter four, conditional support for H2 was found in Models 1 and 2. According to this study therefore, higher levels of student engagement do increase the likelihood of students being temporary persisters over non-persisters, but factors such as living on campus matter more for this comparison. This finding continues to point towards the increased use of engaging educational practices in the freshman year as a possible method of improving institutional persistence rates.

The above finding also provides insight into some of the nuances of sophomore persistence. One of the background characteristics measured in Model 3, whether students lived in college accommodation or not, is significantly related to the probability of being either a non-persister or a temporary persister. Following the narrative of the MLR across the three models for this comparison illustrates this. The four benchmarks of Engage1, that measure the educationally enriching actions taken by students and the institution, are shown in Model 1 to be important in helping students through the freshman/sophomore transition. It becomes clear, in light of Model 2 though, that the students' sense that they are valued by the institution matters more. When both engagement and various background characteristics are considered a further change in the hierarchy of importance occurs. Model 3 points towards physically living on the campus during the freshman year as the crucial element that improves a student's likelihood of temporarily persisting over not persisting at all.

This finding aligns with existing research that shows the positive impact that living on campus can have on student persistence. Astin's (1984 & 1993a) work with involvement, a construct closely related to engagement, found that students living on campus were more likely to develop a connection with the college and more likely to partake in college sponsored extracurricular activities. These factors increased the likelihood of the students persisting at the institution. Skahill (2002), in looking at the role that social support networks play in increasing persistence, found that students living on campus during their first year were more likely to persist than commuter students and more likely to report feeling that they had been successful in attaining social and academic goals.

To understand why these students persistence is only temporary it is necessary to look at the sophomore year. Pattengale and Schreiner (2000) note the move to the sophomore year is full of changes that increase feelings of isolation for some students. Contributing to this is the fact that sophomore students normally move off campus and, in addition, move away from general education courses and the faculty with whom they have begun to establish relationships (Pattengale & Schreiner, 2000).

Tinto's (1993) theory of college student departure provides further insight. Drawing on Durkeheim's (1951) study of suicide, Tinto (1993) posits that feelings of isolation are a crucial antecedent to students' decisions not to persist with college. He suggests that successful social integration is a means of preventing these feelings becoming overwhelming (Tinto, 1993). New research on the importance of students developing a sense of belonging at college supports this suggestion (Hausmann et. al., 2007). It is possible that, for the temporary persisters in this study, physically living on campus was sustaining this sense of connectedness. That is, the relationships these students developed may have been based on proximity rather than some deeper connection. Considering the likelihood that these students then moved off campus in their sophomore year, this would remove the surroundings that formed the foundation for this connection and could trigger the development of feelings of isolation. This could account for why they subsequently left higher education.

Students' ACT scores were also found to be useful predictors in the comparison of temporary persister with non-persisters. Research by Cambiano and others (2000) suggests that ACT scores should be significant predictors of persistence. However, the direction of the relationship indicated by the odds ratio in Table 10 is in contrast to what

would intuitively be expected. The results of the MLR indicate that students with higher ACT scores are less likely to persist temporarily to the sophomore year than they are to leave by the end of the freshman year.

Looking at ACT scores across all three of the comparisons in Model 3 a pattern emerges with regard to temporary persistence. As noted above, in the contrast between temporary persisters and non-persisters, having higher ACT scores decreases the likelihood of temporary persistence. The same is true in the contrast between longterm persisters and temporary persisters. High ACT scores decrease the likelihood of temporary persistence. What can be gathered from these observations is that students with higher ACT scores are more likely to either leave at the end of the freshman year or persist all the way through to the junior year, compared to persisting temporarily.

Taking engagement trends across the comparisons into account a further piece of information emerges. The non-persister group is consistently found to be less likely to be highly engaged. The Model 2 comparisons imply that this is particularly true for the SCE benchmark. So students with high ACT scores who are less engaged are more likely to leave by the end of the freshman year. In contrast, students with high ACT scores who are highly engaged are more likely to be longterm persisters than they are to be in either other group.

As already discussed, if students do not feel sufficiently connected they are less likely to show any form of persistence. Unpacking the Engage1 measure indicates that feeling less academically challenged may also be contributing. Non-persistence due to lack of academic challenge is a danger pointed to in existing literature. The experience of incongruence with regard to academic integration in Tinto's (1993) model of college

student departure contains such a warning. Similarly, Chickering and Gamson (1987) consider high expectations are critical to keeping high achieving students invested in their learning and by implication the institution. In fact, Ryan's (2005) investigation using Chickering's and Gamson's (1987) seven principles of quality undergraduate education pointed out that having higher expectations of students is the best way to improve educational outcomes. Schroeder's and Hurst's (1996) conditions for optimal learning environments also include the existence of challenge and the opportunity to apply knowledge (Schroeder & Hurst 1996).

Students with high ACT scores who feel less connected to their institution may be transferring to another college rather than leaving higher education all together. Indeed, their higher ACT scores may make them more successful at doing this. However, the inability in this study to distinguish transfer students from other non-persisters makes finding confirmatory evidence for this speculation difficult.

No support in this study was found for hypothesis H3 and by association H6. The resulting conclusion is that at the end of the freshman year those students destined to be longterm or temporary persisters had similar levels of engagement. This is a negative finding in regards to the usefulness of students' index scores for predicting longterm persistence. However, it does uncover more detail about the students who temporarily persist to their sophomore year. Two scenarios are possible: (1) something detrimental to the temporary students' level of engagement is occurring during the course of their second academic year; or, (2) a factor external to engagement is leading temporary students to leave. As only the single measure of engagement is taken, this study is not able to comment directly on what is occurring to students' engagement during the

sophomore year. However, by looking at the models across the MLR and the relationships outlined in the differing comparisons, limited exploration of the two scenarios can be undertaken.

The comparison of the temporary persisters and longterm persisters in the final model sheds some light. Model 3 indicates that two background variables are important in this comparison. The first, student ACT scores, is perhaps the easiest to interpret. The model highlights that students with higher ACT scores are more likely to be longterm persisters than temporary persisters. This matches what has been reported in the past. Pre-college academic ability strongly impacts a student's chances of college success including the likelihood of persistence (Cambiano et. al., 2000; Kuh et. al., 2006). Students with less well developed study skills or who are below the average in mathematics and reading are less likely to be successful at college and less likely to persist to graduation (McCarthy & Kuh, 2006; Kuh, 2007; Kuh et. al., 2006). Given the content of the ACT test, it is not unreasonable to assume that lower ACT scores are indicative of these attributes. This, combined with the earlier finding that unengaged high achievers were leaving in their first year, provides an adequate explanation for the direction of the odds.

The second finding is more difficult to explain. The Model 3 comparison reveals that living on campus increases the likelihood of temporary persistence over longterm persistence by approximately 150%. The wide confidence interval hints that this may be somewhat overstated. Across all three comparisons though, living on campus is found only to significantly improve the odds of being a temporary persister when all other variables are taken into account. A plausible conclusion then is that there is something

about living on campus during the freshman year that is either helping these temporarily persisting students stay longer, or that is hindering them from persisting to graduation.

The first alternative has already been discussed above in the findings generated by the temporary persister versus non-persister comparison. If it is the case that the connectedness these students report at the end of the freshman year is reliant on the physical closeness generated by campus living, this has implications for the rejection of H6. It creates the possibility that the temporary persisters' reported levels of engagement in the SCE benchmark may be artificially inflated. It is not possible to explore this further in the current study, but it is nonetheless worthy of note.

One consideration for how institutions can respond to the importance living on campus has for students at risk of only temporarily persisting can be found in Braxton's and McClendon's (2001) recommendations of how to improve social integration. They suggest that residential campuses should require all first and second year students to live on campus (Braxton & McClendon, 2001). Requiring students to continue to live on campus through their second year may help temporary persisters develop stronger relationships that can be sustained once the physical proximity is removed. Keeping this key area of the college experience constant for these students also allows beneficial programs such as learning communities to have greater impact (Pascarella & Terenzini, 1991; Lenning & Ebbers, 1999; Light, 2001; Tinto, 2007).

The finding could also be interpreted as indicating a possible negative effect of living on campus on the persistence of some students. Tinto (1993) makes the comment that college often represents the first time students are living away from home and having to make adult decisions. It is possible that the students in the temporary persistence

group made decisions that were not conducive to their academic success. Yorke and Longden (2004) recognize this possibility. It would be expected, however, that if this were the case it would be reflected in differences between the temporary persisters and longterm persisters on engagement variables. There is no observable evidence of this in any of the models. However, the comparison between temporary persisters' and longterm persisters' mean scores on the LAC benchmark using a one-tailed t-test did indicate that the longterm persisters average score was significantly higher. Considering that the central concern of this benchmark is the measure of students applied academic behaviors and efforts, this could indicate that the temporary persisters may have been prioritizing more social pursuits. The consequences of this scenario could lead to additional barriers for these students in the following academic term and an increased likelihood of leaving the institution (Yorke and Longden, 2004).

It could also be that whatever is causing the negative impact falls outside the domain of experiences covered by engagement, or that the measures of the NSSE are not sensitive enough to pick up on them. Areas of social incongruence (Tinto, 1987 & 1993) may be responsible. For example, Leana (1994) points to some extreme experiences encountered by residential students: listening to a hallmate's experience with date rape; assisting a classmate to get help who has just been mugged along fraternity row; or trying not to seem old fashioned when a roommate invites his or her date to sleep over in the adjoining bed, but finding the scene awkward, and resenting having to take a sleeping bag night after night to a friend's suite to avoid such an encounter.

These one off impactful experiences may not be enough to change a student's overall scores on the SCE benchmark, but they may be traumatizing enough to lead to

withdrawal from the institution in order to return to the comfort offered by the home environment (Tinto, 1993). Kuh (2001-2002) warns that institutions need to be aware of the effects that proximal peer groups in settings such as dormitories are having on student persistence. In these situations, the importance of colleges working to improve campus advising and counseling is intensified. Future research should examine this possibility.

### Recommendations for Future Research

As stated in the delimitations section of chapter one, this study is specifically targeted at a single institution. Differing settings may produce differing outcomes. It is recommended that future research both at the institution where this current study is situated and at other colleges replicate and improve upon this work with the aim of continuing to develop our understanding of the relationship between engagement and persistence. Of note for future studies is the usefulness, illustrated in this paper, of distinguishing temporary persisters from either non-persisters or longterm persisters. This distinction creates additional nuances that may otherwise be overlooked in traditional dichotomous comparisons. Using this design element to track students who complete the NSSE all the way to graduation will provide a highly detailed narrative that can help institutions improve their undergraduate practices. Unfortunately this was not possible in the current study as the institution at which the study is situated has only administered the NSSE to its freshmen for the past three years.

Some of the barriers to interpreting findings encountered in this work also point to fruitful lines of analysis for new studies. The measures of persistence being taken at the beginning and end of each year potentially obscure useful information. Generating

persistence figures this way makes it impossible to tell how much time actually elapses between when students from different year groups leave the institution. For example, the point in time when the temporary persisters leave the institution could be only a few academic weeks after their freshman peers, it could be nearly a year later or evenly dispersed throughout the second year. Determining how far these temporary persisters have moved beyond their freshman experiences and become immersed in the differing experience of being a sophomore is a worthy avenue for future inquiry.

Future studies should also seek to use more complete measures of student background characteristics. The use of multiple measures of pre-college preparation, such as high school GPA or SAT scores was beyond the scope of data available for this study, as was an actual measure of SES. Furthermore studies in differing settings, or with a larger sample in the current setting, should investigate race and ethnicity as part of their analysis. Due to the homogeneous sample this was not possible here.

Qualitative follow ups of departure students, especially those who temporarily persist, could prove to be productive avenues of analysis. Such studies could help establish if the NSSE measures are sensitive enough to capture one off experiences that potentially impact on persistence, and point to additional questions that may improve the benchmark measures.

Finally, a line of inquiry that would be helpful in validating the findings of this and other studies that use the NSSE or similar tools is a comparative exploration of those students who leave before the administration of the NSSE with subsequent non-persisters.

### Conclusion

This study offers evidence that increasing student engagement in the freshman year improves the likelihood of students persisting longterm at an institution. As persistence towards graduation carries an array of benefits for various stakeholders, finding ways to support engagement is obviously desirable. It is important to remember that student success and persistence stems from a variety of sources of which student engagement is only one. Institutions should continue seeking to improve the student experience through strategies such as freshman seminars and advising structures that perform defined support tasks.

As a process indicator, perhaps the NSSE tool itself provides the best indication of what institutions can do to improve how they are assisting students engage in productive practices. Four of the five benchmarks (LAC, ACL, SFI and EEE) consist of a range of both institutional and student orientated items that represent concrete actions that can be either put more pervasively into practice or supported. Many of these changes can be made immediately; others require a longer time investment in order to provide training for faculty.

In this study the fifth benchmark, SCE stands out as the most crucial element in the engagement/persistence relationship. It is a reflection of an institution's culture and student centeredness. For colleges, improvements on the items measured by the SCE benchmark will only come about through sustained efforts at all levels of the institution. Koljatic and Kuh (2001) note that in large organizations characterized by bureaucracy change can be slow to take hold and bringing it about may require negotiating many

setbacks along the way. Institutions genuinely interested in improving the longterm persistence of their students will not use this as an excuse not to begin.

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APPENDICES

APPENDIX A

THE NATIONAL SURVEY OF STUDENT ENGAGEMENT 2007

[http://nsse.iub.edu/pdf/NSSE2007\\_US\\_English\\_paper.pdf](http://nsse.iub.edu/pdf/NSSE2007_US_English_paper.pdf)

APPENDIX B

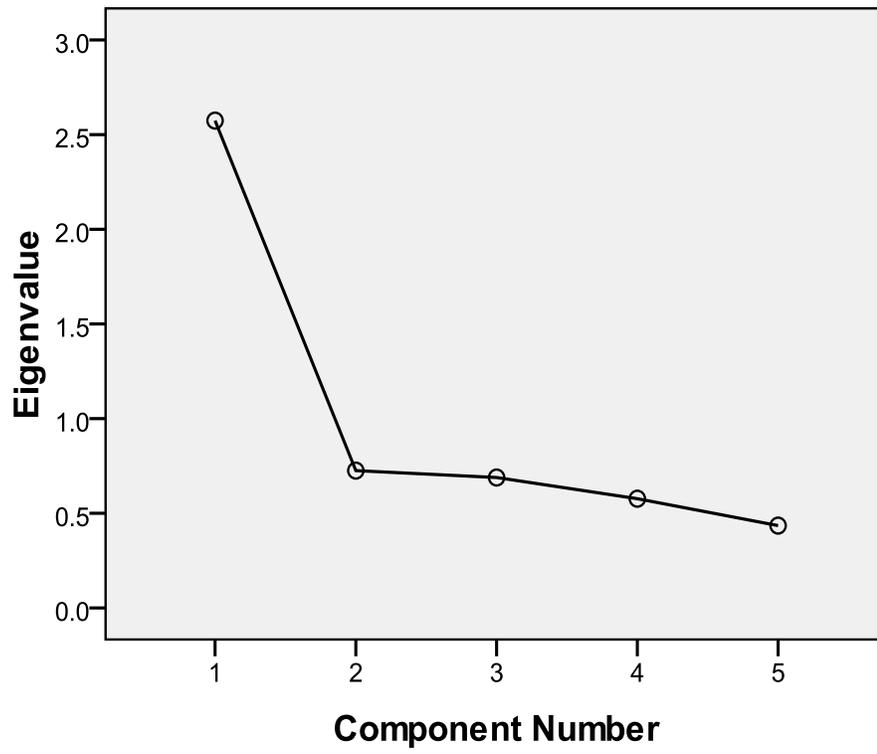
NSSE BENCHMARKS: TABLE OF VARIABLES

[http://nsse.iub.edu/pdf/nsse\\_benchmarks.pdf](http://nsse.iub.edu/pdf/nsse_benchmarks.pdf)

APPENDIX C

FACTOR ANALYSIS: SCREE PLOT

### Scree Plot



(Table generated by SPSS v.17.0)

APPENDIX D

BACKGROUND VARIABLES: FREQUENCY COUNTS AND DESCRIPTIVE  
STATISTICS

Table 11. Frequency Counts for Background Variables used in MLR Analysis

	Frequency	Percentage
<i>FathrEdu</i>		
Did not finish highschool	11	3.0
Graduated from highschool	73	20.2
Attended college but did not graduate	56	15.5
Completed associates degree	59	16.3
Completed bachelors degree	95	26.2
Completed masters degree	40	11.1
Completed doctoral degree	28	7.7
<i>MothrEdu</i>		
Did not finish highschool	5	1.4
Graduated from highschool	54	14.9
Attended college but did not graduate	69	19.1
Completed associates degree	69	19.1
Completed bachelors degree	123	34.0
Completed masters degree	33	9.0
Completed doctoral degree	9	2.5
<i>LiveNow</i>		
College accommodation	270	74.6
Non-college accommodation	92	25.4
<i>Gender</i>		
Male	165	45.6
Female	197	54.4
<i>ACT</i>		
<20	34	9.4
20 to 23	117	32.3
24 to 27	126	34.8
28 to 31	72	19.9
>31	13	3.6

Table 12. Descriptive Statistics of Unstandardized Background Variables used in MLR Analysis

	Mean ( $\bar{x}$ )	Standard Deviation (s)
FathrEdu	4.07	1.62
MothrEdu	4.07	1.36
LiveNow	0.25	0.44
Gender	0.54	0.50
ACT	24.46	3.87