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The Influence of Engagement Upon Success and Persistence of Online Undergraduates

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**THE INFLUENCE OF ENGAGEMENT UPON SUCCESS AND PERSISTENCE
OF ONLINE UNDERGRADUATES**

By Paul D. Dexter

B.A. Saint Michael's College, 1992

M.S.W. Salem State College, 1995

A DISSERTATION

Submitted in Partial Fulfillment of the

Requirements for the Degree of

DOCTOR OF PHILOSOPHY

in Public Policy

The University of Southern Maine

August 2015

Advisory Committee:

Dr. Jeffrey Beaudry, Professor of Educational Leadership, Advisor

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THE INFLUENCE OF ENGAGEMENT UPON SUCCESS AND PERSISTENCE OF
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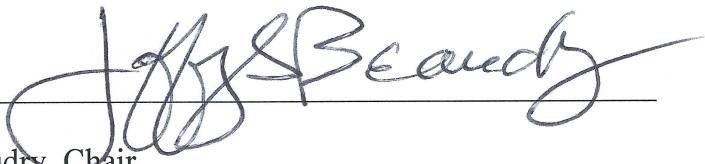
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Paul D. Dexter

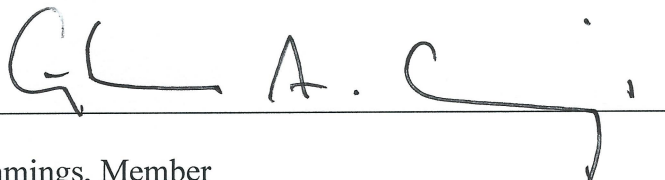
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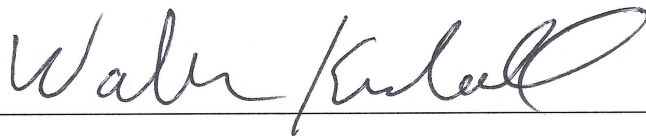
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THE INFLUENCE OF ENGAGEMENT UPON SUCCESS AND PERSISTENCE OF ONLINE UNDERGRADUATES

By Paul D. Dexter, M.S.W.

Dissertation Advisor: Dr. Jeffrey Beaudry

An Abstract of the Dissertation Presented
In Partial Fulfillment of the Requirements for the
Degree of Doctor of Philosophy in Public Policy

August 2015

Institutions of higher education, states, and government agencies are seeking avenues for increasing access, improving learning outcomes, and increasing student retention. The majority of chief academic officers polled indicate that online learning is key to the growth of their institutions, while simultaneously indicating concern that online learners are less likely to succeed and persist. A common construct for how institutions can facilitate student success and persistence is the notion of engagement. Since 2000, campuses have relied upon the National Survey of Student Engagement (NSSE) to guide institutional policies and practices supporting student success. The research on the applicability of the NSSE to online learning is scarce. This ex post facto quantitative study explored the relationship between scores on the ten NSSE Engagement Indicators and two widely used measures of student success: grade point average (GPA) and persistence.

The study sample comprised students from five public state institutions that had administered the NSSE during the 2013 and 2014 cycles. Statistical tests were employed to examine potential differences between online and non-online learners. A small significant difference in GPA was discovered, with online learners having a higher average GPA than non-online counterparts. There was no significant difference in rates

of persistence between the groups. Regression analyses revealed no statistically significant relationship between Engagement Indicator scores and either GPA or persistence.

The study findings did not support assertions in the field that online learners are less likely to succeed than non-online learners. The findings were contrary to previous research on the role of engagement in the equation of student success and persistence. Differences in NSSE scores between online learners and non-online learners offered evidence of how those groups may be distinct. The study suggests the need for delineating NSSE results based upon different groups of students, and brings into question the applicability of the engagement construct for online learners. The need to clearly and consistently define “online” becomes a critical aspect of the discussion. Recommendations for policy and practice are offered, including the importance of addressing attrition bias, and a caution on making inferential interpretations with descriptive statistics from a survey.

DEDICATION

My father, Paul Dexter Sr., embodied the notion of “hard work.” I was born shortly after his return from service in the Vietnam War, and he worked any number and nature of jobs necessary to support his family. He toiled without complaint through physical, mental, and economic challenges. He and my mother, Alice Dexter, placed a great deal of value on education, and somehow afforded undergraduate school for me and my older sister. After 72 years of life, and 46 years of marriage, he passed away after a battle with Parkinson’s Disease during the second year of my Ph.D. program. Since then, my mother has shown tremendous courage and determination to live a purposeful and productive life. I wish my father had been able to share in the occasion of my degree completion, and thank both my parents for paving the road of my educational possibilities.

The sacrifice in completing this Ph.D. was shared by my wonderful family. I am truly grateful for the patience, encouragement, and support offered by my wife, Katie. She is a dedicated educator at Greely High School, and an unfaltering mother to our two children. Katie is a true inspiration, my best friend, and my loving life partner for over 24 years. We share in all of life’s adventures, the greatest of which has been parenthood. Our daughters, Emma and Nora, are the source of so much of my life’s joys, and precious moments. They have blossomed into two of the most caring, intelligent, and balanced young women I have ever known. Bearing witness to their academic achievements and personal milestones motivated me throughout the program, and kept me focused on my goal. I am also forever thankful for the encouragement offered by my in-laws, Thomas and Alvera Bosica, two of the most loving and thoughtful people in

my life.

Finally, I would be remiss if I did not thank our five-year old black Labrador, Luna. She spent countless hours lying at my feet while I read, researched, and wrote my way towards the degree. Her gentle snoring was the soundtrack of my doctoral program.

ACKNOWLEDGEMENTS

I would like to thank Dr. Glenn Cummings and Dr. Walter Kimball for serving on my dissertation committee. I am grateful for their expertise, patience, and guidance. I especially appreciate the efforts of my dissertation chairperson, Dr. Jeffrey Beaudry. His excitement regarding my dissertation topic was infectious from the outset, and helped to sustain me throughout the writing process. Dr. Beaudry offered both sage and practical advice for three years, along with a safe space for me to question, struggle, and brainstorm. Dr. Brian Doore served as an active reader, and helped to make my research and my writing better.

The assistance provided by James Sloan at the Center for Educational Policy, Applied Research, and Evaluation was truly invaluable. Jim served as the objective third party for the construction of my data set. He is a skilled researcher and statistician, one who thankfully speaks in understandable terms about the process for cleaning, organizing, and manipulating data sets. I will always be in his debt for taking time from his daily demands to assist me with the process.

The reference staff at USM Libraries offered assistance with navigating databases and securing articles during the research phase. Their positive energy and knowledgeable service contributed greatly to the completion of this degree.

Mary Sloan, the director of graduate admissions and a long-time colleague at USM, first alerted me to the doctoral program. She has been its champion, and a trusted confidant for many of the students. On behalf of the entire cohort, I thank Mary for her dedication. On a personal level, I thank Mary for her belief in me, and for her genuine interest in my success.

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CHAPTER I: INTRODUCTION

The purpose of this study is to add to the body of literature regarding the role of student engagement in the undergraduate college experience. Institutions of higher education, states, and government agencies are seeking avenues for increasing access to higher education, improving learning outcomes, and increasing student retention. This study informs educators and policymakers who are designing academic programs and campus structures intended to increase access to higher education and increase degree attainment among learners. Institutions of higher education face growing scrutiny regarding student success and persistence to degree completion. A common construct for how institutions of higher education facilitate student success is the notion of engagement.

The engagement construct is one of shared responsibility between an institution and a student: it entails what structures, policies, and practices are implemented by an institution, along with how students avail themselves to opportunities for engagement. Engagement, therefore, is a construct of dual actions: those on the part of students, and those by institutions of higher education. There is compelling evidence that high student engagement is associated with student success and persistence. This study explores and applies the construct of student engagement. While student engagement is widely embraced as essential to student success and persistence in traditional campus-based experiences, it has not been thoroughly evaluated as a predictor for successful completion of online undergraduate courses or degree programs. Before it can be determined if online learning experiences can be assessed with the traditional lens of student

engagement, the question of whether engagement is predictive for success among online learners needs to be examined.

Online learning continues to grow, often touted as an avenue for increasing access to higher education while reducing cost. But not only has there been a scarce application of the success and persistence research to the realm of online learning, there also is a lack of robust research on online learning in general. It has often been assumed that online programs are populated primarily by nontraditional or “adult” learners, who in turn are distinguished from traditional-aged counterparts. Recent indications, though, point to a likely increase in the number of traditional-aged students enrolling in online undergraduate programs. The number of online courses and programs offered by colleges and universities has grown dramatically, along with interest in such programs, across a wide spectrum of learners. As educational models and options change, so too may the constructs of student success and student persistence if the existing constructs do not provide a deeper understanding when applied to online students or online environments. Identifying how institutions can support different learners in the online realm is a timely and crucial endeavor.

Research Questions

The purpose of this study was to explore the relationship between level of student engagement and the rates of success and persistence among students enrolled primarily in online undergraduate coursework. The research questions for this study were:

1. What is the relationship between student engagement and persistence in online undergraduate coursework?

2. What is the relationship between student engagement and cumulative grade point average (GPA) in online undergraduate coursework?

Study Rationale

Student Persistence and Degree Completion Rates

The connection between having a highly college-educated population and being competitive in the global economy has been highlighted in recent national discussions (Lotkowski, Robins, & Noeth, 2004). In 2009, President Obama called for the United States to have the highest proportion of college graduates in the world by 2020 (Casazza & Silverman, 2013, p. 6). While the U.S. Department of Education projects that the country will need 10 million additional college graduates from community colleges and four-year colleges and universities to meet the president's goal, the U.S. will fall 8-million graduates short of that goal based upon current graduation rates according to 2012 data from the Office of Postsecondary Education (Casazza & Silverman, 2013). If we are to make substantive strides towards an increased number of citizens completing some level of college education, "Colleges and universities must find ways to provide meaningful access to increasing numbers of students while reducing their expenses and accelerating students' time to completion" (Casazza & Silverman, 2013, p. 7). However, the time it takes for students to complete a college degree has been a long-standing concern, without a simple solution being identified to make a significant improvement in the national rate of completion. Lotkowski et al. (2004) stressed how, "Low retention rates waste human talent and resources, jeopardize our nation's economic future, and threaten the economic viability of our postsecondary institutions and our country's democratic traditions" (p. 2). There is a sense of urgency to address the high rates of

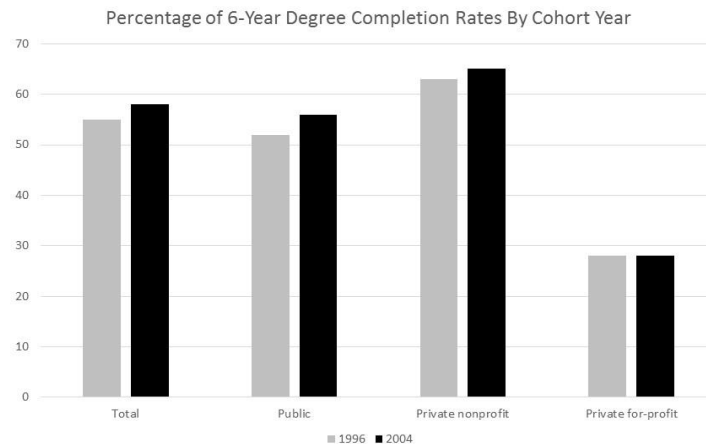
college dropout, and the stakes are high, going well beyond the solvency of any one institution of higher education.

For more than three decades, colleges and universities increasingly have been expected to be accountable for the quality of undergraduate education (Pascarella, Seifert, & Blaich, 2010). College administrators and public officials alike have long looked at retention rates as a key indicator of institutional effectiveness (Astin, Korn, & Green, 1987). The concept of student persistence has been a mainstay in higher education research due to long-standing concerns about high attrition rates, which involve considerable costs to individuals, institutions, and society. Public policymakers and institutional administrators continue to ask how the educational system can improve the degree of student success in college. The economic and social benefits associated with postsecondary education have provided an impetus for a wide range of organizations across the country to launch initiatives in support of the college completion agenda (Hu, 2011; Hu & McCormick, 2012; Shapiro, Dundar, Ziskin, Yuan, & Harrell, 2013). With stagnant degree-completion rates, there is an urgent need to better understand college students, and to design effective policies and programs to help students succeed.

Enrollment trends, degree completion rates, and student demographics were examined by the National Center for Educational Statistics in *The Condition of Education 2012*, illustrating how postsecondary graduation rates have remained at a relative plateau for well over a decade. According to the report, 55 percent of first-time, full time students who began seeking a bachelor's degree in the fall of 1996 completed within six years at that institution. For first-time, full-time students who began their bachelor's degrees in fall 2004, 58 percent completed the degree within six years (Aud, S., Hussar, W.,

Johnson, F., Kena, G., Roth, E., Manning, E., Wang, X., & Zhang, J., 2012, p. 90). Seventy-nine percent of first-time, full-time students were “retained” (returned in 2010 after beginning studies in 2009), while 45 percent of first-time, part-time students persisted from first to second year (Aud et al., 2010). First-to-second year persistence rates differ between institutional types, with private institutions retaining students at slightly higher levels. These results are summarized in Figure 1.1:

Figure 1.1: Bachelor’s Degree Completion Rates



In 2013, the National Student Clearinghouse Research Center published its second annual report on national college completions rates “in response to the limitations of institution-based research by focusing on student-level data” (Shapiro, Dundar, Ziskin, Yuan, & Harrell, 2013). The center tracked the completion of postsecondary certificates and degrees among first-time degree-seeking students who started their postsecondary educations in fall 2007. A significant differentiation between the *Condition of Education 2012* and the approach taken in developing the NSCRC report was how the latter elected to follow student enrollments nationwide from fall 2007 through spring 2013. That

allowed an exploration of degree completion rates across institutions, not one limited to the institution at which students first enrolled in an undergraduate program. Shapiro et al. (2013) found that 56.1 percent of first-time degree seeking students who enrolled in fall 2007 completed a degree or certificate within six years, including 13.1 percent who completed at an institution other than the initial institution. Therefore, even accounting for movement between institutions, just over half of students have been successfully completing their degree program within six years of initial enrollment.

As a follow up, the NSCRC published *Completing College: A State-Level View of Student Attainment Rates* in February 2015. The cohort comprised first-time degree-seeking students who started their postsecondary studies in the fall of 2008, nearly 2.7 million students. The study found notable mobility among students pursuing a degree: nationally, 13 percent of students who started at four-year public institutions completed at an institution other than their initial institution, and one in three students who started at two-year public institutions completed at an institution other than the one where they first enrolled (Shapiro, Dundar, Wakhungu, Yuan, & Harrell, 2015). The overall six-year completion rate for first-time-in-college degree-seeking students who started college in fall 2008 was 55.1 percent, with nearly one in four students completing a degree at an institution other than the one where they were initially enrolled (Shapiro et al., 2015).

Accounting for the mobility among institutions has the potential to offer a more accurate picture of national and state degree completion rates. However, the NSCRC study also found differences in completion rates between age groups, adding a layer of complexity to the degree-completion discussion. There was a considerable gap between the overall completion rates of traditional-age students and older students, with adult

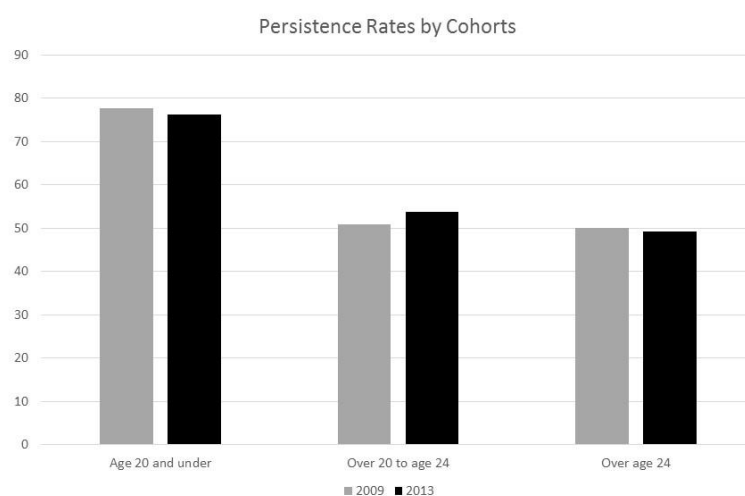
learners (defined as over the age of 24 at first entry) showing a six-year completion rate 17 percentage points lower than that for the traditional-age group (42 percent and 59 percent, respectively) (Shapiro et al., 2015). Those findings indicate the importance of exploring how the undergraduate experience for traditional-age learners may be distinctly different than that of older learners.

The NSCRC reported on the most recent college-persistence and retention data in spring 2015. “Persistence” is defined as the percentage of students who return to any institution of higher education for their second year of college, while “retention” is the percentage of students who return to the same institution in their second year (Shapiro, et al., 2015). Among students who started college in fall 2013, 69.6 percent returned to college at a U.S. institution in fall 2014, and 59.3 percent returned to the same institution. More longitudinally, about one in nine students who started college in any fall terms between 2009 and 2013 transferred to a different institution by the following fall (Shapiro et al., 2015). That reinforces the earlier NSCRC findings regarding the mobility of students, and the importance of being able to track progress towards degree completion across institutions.

According to the 2015 NSCRC report, persistence differed among age groups. For students 20 and under at the time of beginning college, the persistence rate was 76.3 percent, down 1.4 percentage points since 2009. Students over 20 and up to 24 years of age saw the largest gains in persistence (up 2.8 percent since 2009). That group, though, accounted for only 7.5 percent of the overall fall 2013 cohort. For students over age 24 at the time of college entry, the persistence rate was 49.3 percent, down 0.7 percentage points since 2009 (Shapiro et al., 2015). These data illustrate the national trend among

first-to-second-year college enrollments, a key component to students' eventual rate of degree completion. The persistence trends are summarized in Figure 1.2 below. Looking holistically at the retention, persistence, and degree-completion trends, it is clear that the needle has not moved significantly in the positive direction over the past four years. This reinforces how, despite the national call to action, undergraduate students are still facing considerable challenges in their collective efforts to earn a college degree.

Figure 1.2: First to Second-Year Persistence by Age Group



It is noteworthy that neither the National Student Clearinghouse Research Center reports nor the National Center for Educational Statistics report even mentioned the term “online learning”. As a result, it is unclear in these studies whether the rates of student persistence and degree completion differ among traditional face-to-face learning experiences and online experiences. Online programs have been touted as offering students a higher level of access and convenience, although relatively little has been written about retention and online learning, especially among online institutions of higher

learning that have developed since the early 1990s (Boston, Ice, & Gibson, 2011). There have been some indications that retaining students in online courses can be even more challenging than keeping students in face-to-face courses (Clay, Rowland, & Packard, 2009; Johnson & Mejia, 2014). However, empirical data is not provided in such prominent reports as those mentioned above. The rapid rate of expansion of online learning warrants examination, as it has implications for how researchers, institutions, and states gather and report data on student persistence and degree completion in higher education.

Expansion of Online Learning

This section summarizes the growth of online learning, and illustrates how the lack of unified terminology in the field poses challenges to understanding the efficacy of online learning. Opportunities for online learning experiences continue to grow, including blended and fully online college courses. There are massive open online courses (MOOCs), virtual high schools, and other offerings for learners across the lifespan. The expansion of online learning among the K-12 population has implications for the field of higher education. According to the Evergreen Education Group, approximately 620,000 students in the K-12 population took an online course during the 2011-2012 school year, an increase of 16 percent from the previous year. The number of states and school districts requiring online courses for high school graduation has also grown, with Virginia and Idaho joining the ranks of Alabama, Florida, and Michigan as having laws mandating virtual education (Sheehy, 2012). More than two-thirds of school districts in 2007-2008 had at least one student who was taking an online course, and it has been predicted that, by 2019, half of courses in grades 9-12 will be delivered online (Van Der

Werf & Sabatier, 2009). As more K-12 learners experience online learning, it is reasonable to expect that more will pursue a partially, or fully, online path of higher education.

The growth of online education has been influenced by the distance education movement. Distance education became available through online courses, and over time traditional face-to-face courses have changed to take advantage of new technology (Bejerano, 2008). Which students, though, are drawn to online learning? Overall, the fastest-growing demographic group in the next decade of higher education are those ages 25 to 44 (Van Der Werf & Sabatier, 2009). As institutions of higher education increase online options for adult learners who may be better suited for that learning environment, what are the implications as more traditional-age learners are drawn toward the option of online undergraduate education? According to the NCES report, 15 percent of undergraduates age 23 or younger participated in a distance education course, with only 1 percent being enrolled in a distance-education degree program, compared with 5 percent of those ages 24 to 29 and 8 percent of those age 30 and older. In the same document, however, it is reported that students age 23 or younger comprise 22 percent of all students enrolled in a distance-education degree program (p. 11).

The pressure to move more educational experiences online may have some unanticipated and unintended influences upon learners. Allen (2006) asserted that “the rush to provide advances in technology, specifically on-line and distance learning, is in sharp contrast to the institutional goals of retaining and graduating students” (p. 122), a movement which may be setting up students for failure. That sentiment is echoed in the *State U Online* report, which recommends that institutions and state systems provide

support and retention efforts “given the attrition problems that can occur with online course-taking” (Fishman, 2013, p. 24). The challenge remains for many institutions to define “online learning” and structure data-collection procedures in a manner that distinguishes a fully online learner from a partially online or face-to-face student.

Bowen (2013) attributes the proliferation of online offerings to three fundamental, and potentially lasting, forces: technological advances, students’ acceptance and embracement of all things digital, and “the growing consensus in public discourse that current trends in both the cost of higher education and such outcomes as completion rates and time-to-degree are neither acceptable nor sustainable” (p. 2). Initially, the growth of distance education was potentially limited by the 50 percent rule of the Higher Education Act of 1992, under which schools offering more than 50 percent of their courses through distance education were not eligible to distribute Title IV student financial aid (Deming, Goldin, Katz, & Yuchtman, 2015). Waivers to that rule began to be granted in 1998, and the rule itself ended in 2006, opening the field to more competition (Deming et al., 2015). The increased competition, along with advances in online learning technology, might be able to “bend the cost curve” in higher education, although “it is possible that the quality of education suffers when more content is delivered online” (Deming et al., 2015, p. 7). The growing cost of higher education is a clear motivator for institutions and students alike to consider online options. However, Bowen (2013) cautioned that: “There is, truth be told, far too little hard evidence available about what works and what cost savings, if any, can be anticipated” (p. 3). Nevertheless, the concept of cost savings continues to be part of the rationale for the expansion of online learning in higher education.

Projected trends in higher education point to more traditional students pursuing an undergraduate education through nontraditional avenues. In a Chronicle Research Services poll of 121 college admissions and enrollment officials, almost one quarter of respondents think students in 2020 will take 20 to 40 percent of their courses online, with 9.5 percent of respondents reporting the percentage of online courses will be even greater (Van Der Werf & Sabatier, 2009). Terminology in the field continues to evolve with various delivery methods of educational experiences, but the lack of uniformity of the vernacular can lead to confusion about what constitutes “online learning”, as well as the applicability and significance of data. A recent example is embodied in a report prepared for the U.S. Department of Education’s National Center for Education Statistics (NCES), *Learning at a Distance: Undergraduate Enrollment in Distance Education Courses and Degree Programs*. Students selected for inclusion in the statistics are defined as those who:

reported that they took a course for credit during the academic year that was not a correspondence course but was primarily delivered using live, interactive audio or videoconferencing, pre-recorded instructional videos, webcasts, CD-ROM or DVD, or computer based systems delivered over the internet. (Radford & Weko, 2011, p. 2)

Similarly, undergraduate students are labeled as having participated in a distance-education degree program if they reported that their entire degree programs were taught through such courses (Radford & Weko, 2011). That definitive language casts a wide net in terms of the array of “distance” learners, making it challenging to differentiate between students enrolled in fully online undergraduate programs and those who are using one or

several technology-based approaches in pursuit of their degrees. The study itself uses a methodology that collects data from instruments administered to students via telephone and internet, as well as data collected from databases of student-loan programs and financial-aid applications. It is questionable whether the combination of self-reported data from students and data sets from other sources results in uniform data based upon common definitions for terminology.

That definition is a topic of analysis in a report created by the New America Foundation and Education Sector, *State U Online*. Noting how the NCES definition measures distance education within “a smorgasbord of models”, the authors suggest that:

As online education has grown significantly over the past decade, and as more brick-and-mortar students take a hybrid of online and face-to-face courses it has become necessary to designate the difference between a fully distance-education student and a student enrolled in online courses and/or degree programs in order to better understand online student movement and outcomes. (Fishman, 2013, p. 23)

The policy implications are clear: better measurement of online student participation would increase understanding of trends in online education, and assist campuses and states to set goals for online programs and measure progress (Fishman, 2013).

Recently, attempts have been made to clarify the extent to which students are selecting online options as part of their pursuit of college degrees. In February 2015, the Babson Survey Research Group (BSRG) released *Grade Level: Tracking Online Education in the United States*, its twelfth annual report documenting online learning in the country. The widely disseminated and oft-cited series has begun a transition from

using data collected by BSRB to using enrollment numbers from the National Center for Educational Statistics' Integrated Postsecondary Education Data System (IPEDS).

Differing definitions of “online” have historically led to discrepancies in the total counts of students taking online courses. For example, the IPEDS results produced a smaller estimate (5,257,379) for 2013 than did the previous BSRG numbers (7,126,549) (Allen & Seaman, 2015). Even with that change in data sources for the annual report, definitions remain incongruent. For the past twelve years, the BSRB definition has been:

An online course is defined as one in which at least 80% of the course content is delivered online. Face-to-face instruction includes courses in which zero to 29% of the content is delivered online; this category includes both traditional and web facilitated courses. The remaining alternative, blended (or hybrid) instruction, has between 30% and 80% of the course content delivered online. (Allen & Seaman, 2015, p. 8)

However, the primary source of the enrollment data, IPEDS, defines a distance education course as, “A course in which the instructional content is delivered exclusively via distance education” (Allen & Seaman, 2015, p. 8). Within one report, therefore, there is not a unified definition of online learning: the BSRG definition serves as the prompt for educational leaders to self-report perceptions regarding online learning, and the IPEDS enrollment data is founded upon a more restrictive definition. While that is an important caveat when considering the results, the annual BSRG report has been the only national chronicler of online and distance education for the past decade (Allen & Seaman, 2015), offering a benchmark for the growth of online learning, and a snapshot of the perspectives of leaders in higher education.

In the face of shrinking enrollments, it is not surprising that there was a growth in the proportion of chief academic leaders reporting that online learning is critical to their institutions' long-term strategies, increasing from 48.8 percent in 2002 to 70.8 percent in 2014 (Allen & Seaman, 2015). While the rate of growth among students electing to take at least one distance-education course has slowed, it is still greater than the growth rate of the overall higher-education student population (Allen & Seaman, 2015). According to the BSRG report, the two classes of institutions showing the greatest growth between 2013 and 2014 were public four-year institutions (increased by 126,824 or 7.2 percent) and private non-profit four-year institutions (up by 86,811 or 12.7 percent) (Allen & Seaman, 2015, p. 5). In addition to the year-to-year growth comparison offered in the annual BSRG report, chief academic officers are asked to report their perceptions about the relative quality of both online and face-to-face instruction, which could be based upon a wide range of factors including detailed course metrics, conversations with peers, and stories from the press (Allen and Seaman, 2015). Below are some of the key findings from the BSRG report:

- 28 percent of chief academic officers say that their faculty members accept the “value and legitimacy of online education”, a rate substantially the same as it was in 2003.
- The proportion of academic leaders rating the learning outcomes in online education as the same or superior to those in face-to-face instruction grew from 57.2 percent in 2003 to 77.0 percent in 2012. The upward trend reversed in 2013, with a dip to 74.1 percent, a rate that remained constant in 2014.

- Fewer leaders rate the learning outcomes in online courses as “superior” or “somewhat superior” to face-to-face (20.0 percent to 16.3 percent), but greater numbers rate them as the “same” (54.1 percent to 57.9 percent).
- 68.3 percent of academic leaders believe that “students need more discipline to succeed in an online course than in a face-to-face course”, and leaders with the most experience with online and distance courses are the most likely to assert that belief. (Allen & Seaman)
- “Increasing numbers of academic leaders think that retaining students is a greater problem for online courses than for face-to-face courses (44.6 percent in 2014 versus 40.6 percent in 2013, 28.4 percent in 2009, and 27.2 percent in 2004).” (Allen & Seaman, 2015)

The same leaders asserting the importance of online learning to their institutional growth strategies have concerns about that growth. One of them centers on the key metric of institutional effectiveness: student retention. However, as noted by Allen and Seaman (2015), “While these results show an increasing level of belief that student retention for online courses is a greater problem than for face-to-face instruction, it does not tell us why this is so” (p. 24). Additionally, some of the trepidation academic leaders continue to have regarding online learning may be attributed to the lack of an agreed-upon measure of educational quality (Allen & Seaman, 2015). Without consistent quality metrics in place for online coursework, such trepidation may be warranted.

Student interaction with instructors, both for face-to-face and for online learning experiences, has often been raised as a critical component of educational quality. In response to the third annual *Inside Higher Ed Survey of Faculty Attitudes on Technology*,

80 percent of faculty and 89 percent of administrators rated “very important” that “online courses and programs provide meaningful interaction between students and instructors” (Jaschik & Lederman, 2014, p.7). However, other results from the survey raise questions regarding how consistently that is achieved on a variety of measures:

- Only nine percent of faculty members strongly agreed that “online courses can achieve student learning outcomes at least equivalent to those of face-to-face courses”.
- Eighty-three percent of faculty reported that online courses are of lower quality than face-to-face courses in terms of interaction with students during class.
- Seventy-seven percent of faculty reported a lower ability to reach “at-risk” students in online course. (Jaschik & Lederman, 2014)

As with the BSRG survey, those results were based on the perceptions of postsecondary academic leaders and faculty. With online education potentially offering avenues for enrolling more students, and creating paths to degree completion, assessment of online learning becomes a vital component of the policy equation.

A 2010 U.S. Department of Education meta-analysis of evidence-based online learning indicates on average a greater effectiveness of online learning than traditional face-to-face instruction (Means, Toyama, Murphy, Bakia & Jones, 2010). However, the inconsistencies among studies and confounding practice variables in the meta-analysis led to a response that questions the applicability of the findings. Jagers and Bailey (2010) noted of the meta-analysis that the positive effect of online learning outcomes “was much stronger when contrasting hybrid-online courses to face-to-face courses than when contrasting fully online to face-to-face courses” (p. 2). Again the lack of shared and

clear terminology plays an important role: the definition of “online learning” in the DOE’s meta-analysis includes both fully online and hybrid courses, a distinction potentially overlooked by the average reader or the popular press. Delving deeper into the constructs of the meta-analysis shows that more than half of the 28 studies on fully online learning “concerned not a semester-length course but rather a short educational intervention on a discrete and specific topic, with an intervention time as short as 15 minutes” (Jaggers & Bailey, 2010, p. 3). Such educational experiences are quite distinct from the typical semester-long course where there is more likely to be direct contact between students and their professors. Additionally, few of the studies included in the meta-analysis attempted to assess the causal impact of course-delivery format on student learning outcomes (Wu, 2015).

Jaggers and Bailey (2010) pointed out how the topics of many courses included in the meta-analysis also were particularly well-suited to the online context, such as how to use an Internet search engine. The studies included target populations such as primary school students and professionals outside of the college setting, with only seven studies being conducted with undergraduate or graduate students in semester-long online courses. Of those seven studies, all were conducted at mid-sized or large universities rated as either “selective” or “highly selective”. That could indicate that the sample in the meta-analysis may not be representative of some of the very populations online learning is touted to support through better access or affordability (Jaggers & Bailey, 2010). It is important to note that increased access to college through online learning options does not imply increased likelihood of degree completion. Wolff, Wood-Kustanowitz, and Ashkenazi explained how almost all of the studies in the meta-analysis

neglected to report on student attrition rates, making it impossible to determine if differential attrition rates may have biased the measures of student performance (2014). Higher withdrawal rates among lower-performing online students can make online learning outcomes seem superior: students who persist may already be higher performing.

In a more recent review of the empirical literature on online learning, Wu (2015) examined research published between 2013 and 2014, focusing upon twelve studies that met the research criteria. It was found that several studies neither defined nor differentiated between the types of online and hybrid courses included, which can muddy the results “given that other studies have shown that online and hybrid delivery formats produce different learning effects in terms of magnitude, direction, and statistical significance (Wu, 2015, p. 14). Wu (2015) noted, “While the potential benefits of online learning have been widely discussed, there is still too little known about the extent to which students have realized these benefits” (p. 18). No study went beyond course-specific outcomes to study longer-term effects such as retention, graduation rates, and time to degree attainment (Wu, 2015). Similarly, none of the studies accounted for attrition bias, an oversight that “very seriously threatens a study’s validity when course performance at the end of the semester serves as the dependent variable of interest” (Wu, 2015, p. 13). Of all the factors of interest in the field regarding higher education, the notion of persistence is perhaps one of the most critical. It is also one of the most neglected aspects of the discussion regarding online learning.

Advocates of online learning are optimistic that fully online coursework promotes greater access by reducing the cost and time of commuting, as well as by providing a flexible schedule for the learner (Jaggers & Bailey, 2010; Griffiths, Ghingos, Mulhearn,

& Spies, 2014). However, studies suggest that under-prepared students are more likely to withdraw from online rather than face-to-face courses, even after including a variety of controls (Jaggers & Bailey, 2010; Johnson & Mejia, 2014). There may be other distinctions to consider among subpopulations of college students, such as community colleges versus four-year institutions. The largest postsecondary educational system in the nation is the California Community College system, and community colleges are more likely to serve nontraditional students with family and work obligations, students who could potentially benefit the most from online learning options (Johnson & Mejia, 2014). A study of online students in the California system found that 79.4 percent of all students enrolled in online courses between 2011 and 2012 completed the courses, compared to 85.9 percent among those enrolled in traditional courses (Johnson & Mejia, 2014). Furthermore, those completing online courses with a passing grade did so at a 10 percentage point lower rate than those in face-to-face courses, a gap that has persisted for the last decade (Johnson & Mejia, 2014). One positive outcome of the study was that students who took at least some online courses were more likely than those who took only traditional courses to earn an associate's degree or to transfer to a four-year institution (Johnson & Mejia, 2014). When considering achievement among different groups of students enrolled in the community colleges, the study found that online learning does nothing to overcome achievement gaps across racial and ethnic groups, and "in fact, these gaps are even larger in online classes" (Johnson & Mejia, 2014, p. 2). Therefore, some of the populations that may benefit from increased access to education through online avenues may struggle more than others.

The difference between achievement among racial and ethnic groups has been an area of study, both with face-to-face and online learning environments. As Bowen (2013), mused: “Will the development of various forms of online learning help level the playing field or exacerbate the already large divide between educational haves and have-nots?” (p. 12). In a more longitudinal study, researchers followed a sample of more than 40,000 degree-seeking students enrolled in one of Washington state’s 34 community or technical colleges for five consecutive years (2004-2009). Nearly 500,000 online and face-to-face courses were taken among the sample. The results showed that all types of students performed more poorly in online courses than they did in face-to-face courses, but the performance gap varied significantly across subgroups (Xu & Jagers, 2014). The findings suggested that performance gaps between key demographic groups already observed in face-to-face classrooms are exacerbated in online courses, such as those among males, African American students, and students with lower level of academic preparation (Xu & Jagers, 2014). The researchers warned, “If this pattern holds true across other states and educational sectors, it would imply that the continued expansion of online learning could strengthen, rather than ameliorate, educational inequity” (Xu & Jagers, 2014, p. 651). As institutions of higher education incorporate opportunities for online learning into long-term growth and sustainability plans, understanding how specific conditions influence persistence among online learners can guide practices for maintaining high enrollment within online programs, and the effective and efficient allocation of resources to support online learners and educators.

At the same time that many students are demanding more online options, others want to learn in traditional classroom settings. Some students recognize that “they need

the discipline of going to classes at set places and times, or they will never get around to studying” (Van Der Werf & Sabatier, 2009, p. 4). Such recognition is consistent with literature on online learning that suggests online courses require students to assume greater responsibility for their learning, and may need higher levels of self-regulation, self-discipline, and metacognitive skills (Xu & Jaggars, 2014). It is likely that many students would benefit from the structure of the physical classroom to succeed, as they may not possess the metacognitive insight regarding how they learn best. Driven by the allure of online learning, and even perhaps some limited online experience prior to college, students may perceive a fully online undergraduate degree as a viable and attractive option for degree attainment. The concern about traditional-age undergraduates is summarized by DiBiase and Kidwai (2010). Older cohorts are seen as being more spontaneously engaged, while the less-experienced younger students may warrant a more proactive approach by instructors to elicit engagement. Coupled with inexperience in self-directed learning and the demanding content of undergraduate courses, that can “conspire to undermine younger students’ readiness to thrive in online learning environments” (DiBiase & Kidwai, 2010, p. 324). The researchers assert that “if evidence indicates that some student cohorts are not well served by online learning, it is our duty to advise administration accordingly, and to propose alternatives that accommodate both student needs and institutional goals” (DiBiase & Kidwai, 2010, p. 303). Administrators and policymakers may need to differentiate among learners in regards to the likelihood of success and persistence along any chosen path towards degree completion.

Patrick M. Callan, president of the National Center for Public Policy in Higher Education, noted how online institutions can keep costs low and appeal to a wide array of

students, but that successful colleges will combine online learning with classroom instruction since “younger students in particular need the structure and discipline of a classroom if they are going to learn” (Van Der Werf & Sabatier, 2009, p. 25). Caution has been expressed regarding adult students in online programs as well. Tim Panfil, managing director of the School for Advanced Learning at Elmhurst College, points out, “Convenience does not equate to easiness, and a lot of adult students don’t understand the level of discipline it takes to complete a program entirely online” (Van Der Werf & Sabatier, 2009, p. 49). Panfil has observed an increase in the number of adult students who had enrolled in online degree or certification programs but could not complete them, attributed at least in part to a lack of understanding on the time it takes if one is to succeed in online programs. Researchers with the Community College Research Center analyzed a dataset of over 51,000 degree-seeking students in the Washington state community college system to examine whether adaptation to the online learning environment varies across student characteristics. Findings indicate that older students adapted more readily to online courses than did younger students, while older students demonstrated poorer academic performance in online courses as compared with face-to-face courses. The researchers suggested that older students may be willing to trade better academic performance for a more flexible academic schedule associated with online learning (Xu & Jagers, 2013).

Gaps Addressed in this Study

The focus of this study is the concept of student engagement, one that permeates age groups, disciplines, and types of academic programs in higher education. Distinguishing between traditional-age undergraduates and adult learners in online

programs is not a focus of this research study, yet is notable for the prevalence of discussion in the field. According to Carini, Kuh, and Klein (2006), the value of student engagement extends beyond the undergraduate experience, as the act of being engaged adds to the foundation of skills and dispositions essential to live a productive and satisfying life after college. The importance of engagement is well documented, yet much like other terminology, engagement is not limited to a narrow agreed-upon definition.

It is unclear from the existing research whether online learning affords opportunities and conditions long associated with student success and persistence. However, it has not yet been established whether the model of student engagement is an appropriate one for understanding the online learning environment, or predicting student success. This study applied the common construct of student engagement to online learning. It also examined online learning over time and across experiences, going beyond the course-specific and semester-centric approaches taken by previous researchers. Finally, unlike other studies that are campus centric, this study includes several campuses operating in the same state institution, casting a wider net for inclusion of students who may have been highly mobile between campuses along the path toward degree completion. For the purpose of this study, each of the terms discussed was operationalized to establish context and offer clarity for future study.

Operational Definitions of Key Terms

Below are some of the operational definitions of key terms for the purpose of this study. Definitions were chosen by the researcher to align with the preponderance of previous research on the topic, as selecting common vernacular will contribute to more accurate interpretation and application of the research findings.

- **Traditional-age students** are undergraduate students between the ages of 18 and 25, while **adult students** (interchangeable with **nontraditional students**) are older than 25 years.
- **Online learning** describes undergraduate courses comprising for-credit semester-long learning experiences, delivered entirely through web-based modalities. The term intentionally excludes blended learning, which inherently involves some face-to-face contact with peers and the faculty. Learning experiences not equating to a semester-long course of at least three credits are also excluded.
- An **online learner** is defined as an undergraduate student having taken at least 50 percent of coursework online. Students must be enrolled in at least two online courses per semester for participation in the study, allowing for the inclusion of part-time students.
- **Success** is measured by cumulative grade point average (GPA), as it is often representative of “good academic standing” at many institutions of higher education.
- **Persistence** is demonstrated by enrollment in at least three consecutive academic semesters at the same institution of higher education, with a credit load of at least six credits per semester.
- **Engagement** is defined as a critical threshold of time students allocate to educationally purposeful activities, measured by the National Survey of Student Engagement (NSSE). NSSE Engagement Indicator scores will represent the concept of engagement.

Study Limitations

In the design phase, some study limitations were anticipated, facets of the study that could be controlled. Those can impact the generalizability of the findings. The limitations for this study are:

1. Using a convenience sample presents a potential bias in representation, as the entire spectrum of learners across measures such as age, race, socioeconomic status, rural/urban residence, or family history of postsecondary education were not proportionately represented among the subjects in this study.
2. Based upon the timing of the NSSE administration across institutions, an attrition bias may have been inherited with the data set, as students who were most at risk may have dropped out prior to the administration of the NSSE in the spring semester of each cohort year.
3. The geographical location of the online learners may have increased or decreased the availability of involvement opportunities, which in turn may have influenced the amount of time allocated to outside-the-classroom engagement among online learners.
4. The subjects in this study fell within a finite array of academic majors based upon the online offerings of their institution(s). Caution will need to be used in how the study findings are extrapolated to other disciplines and majors that are distinctly different from those in this study.
5. This study relied on data from multiple institutions, each of which defined “online learner” slightly differently. Efforts to address those potential discrepancies were

made, yet may have not fully compensated for nuances among individual campuses included in the study sample.

CHAPTER II: LITERATURE REVIEW

This literature review provides a foundation for understanding the construct of student engagement. The first part of the review chronicles the focus upon student success, retention, and persistence in the field of higher education. That is followed by an explanation of the emergence of student engagement theory, including distinctions among three often-interchanged terms in the field: involvement, integration, and engagement. Linkages are made between student engagement and measures of student success and persistence. The intent was to establish how those concepts are both distinct and related, with one outcome being the creation of the widely administered National Survey of Student Engagement (NSSE). The history of NSSE shows how the instrument was built on the concept of engagement that emerged over time. A summary of how the NSSE has been administered in the field is provided, along with an exploration of the most-studied issues for NSSE administration and interpretation. Exploration of the NSSE includes discussion of its application for traditional-aged students, adult learners, and online learners. Altogether, the literature review offers the context for understanding the rationale for and design of the research study concerning student engagement.

The Emphasis upon Student Success and Persistence

College retention rates have not significantly improved over the years, despite the many and varied programs and services that colleges have instituted (Seidman, 2005). By the mid-1970s, enrollments in higher education had exceeded 11 million; but growth was becoming stagnant, which spurred leaders at colleges and universities to further explore better ways for attracting and retaining students on their campuses (Seidman, 2005). In 1975, the federal government requested a research-based report on how shifting federal

financial-aid policies could potentially increase student persistence, and the response to the article fueled the conversation about student attrition and retention (Spann, 1990).

The report began with an acknowledgement of how the working definition at that time of “dropout” could significantly impact questions of policy in higher education (Tinto, 1975):

From the institutional perspective, administrators may be unable to identify target populations requiring specific forms of assistance. From the wider perspective of the state, planners may not be able to provide for flexible admission and transfer procedures that permit individuals to find a niche in some part of the higher education system more easily. (p. 90)

The model offered in the report explained how dropout decisions were influenced by several factors, including individual attributes, goal and institutional commitment, performance, interactions, and academic and social integration (Tinto, 1975). Dropouts occurred both voluntarily and involuntarily, with voluntary withdrawal taking into consideration a cost-benefit analysis by a student, and seemingly relating to “the lack of congruency between the individual and both the intellectual climate of the institution and the social system composed of his peers” (Tinto, 1970, p. 117). It was emphasized that “one must view dropout from college as the outcome of a longitudinal process of interactions between the individual and the institution (peers, faculty administration, etc.)” (Tinto, 1970, p. 103). The outcome of student retention, or lack thereof, became the shared responsibility of the individual and the institution.

The study of retention expanded rapidly in the 1980s, driven mainly by the practical realities of demographic shifts in the potential college student population

(Seidman, 2005). Although focused on K-12 education, the publication of *A Nation at Risk* in 1983 contributed to “a palpable sense of urgency for colleges to demonstrate that they provide a high-quality undergraduate education by reporting on their students’ cognitive and personal development” (Pascarella et al., 2010, p. 16). By the end of the 1980s, knowledge about student retention had increased through writing and research, along with increased communication across campuses, and the featuring of retention as an important theme at regional and national conferences hosted by major associations in higher education (Seidman, 2005). The focus on retention expanded to include the concept of persistence, with the recognition that student success included the ability to persist to the completion of a degree at more than one institution (Seidman, 2005).

According to Tinto, early literature framed the issue of college attrition as the failure of the student to “measure up to college in terms of maturity level, ability, or personality” (as cited in Spann, 1990, p. 18). With the emergence of new research, it became more and more clear that it was the interaction between the student and the campus that was most influential. Students were more likely to succeed at colleges and universities committed to their success, ones that maximized good practices and enhanced students’ academic and social engagement or effort, and that cultivated positive working relationships among groups (Pascarella, 2001; McClenney, 2006).

A consistent body of evidence indicated that one of the most powerful sources of influence on student learning, along with student persistence, was interpersonal interaction, whether it be with peers or faculty (Spann, 1990; Terenzini, Pascarella, & Blimling, 1999; McClenney, 2006). That interpersonal interaction occurred both inside and outside of classrooms. As more research emerged, it became clear that students’ out-

of-class experiences appeared to be far more influential in students' academic and intellectual development than many faculty members and academic and student affairs administrators had thought (Terenzini et al., 1999). It is worth noting that much of the literature regarding the influence of student experiences on learning "is dominated by studies of white, traditional-age, full-time students attending four-year residential institutions" (Terenzini et al., 1999, p. 611). However, the increased understanding of the interplay between academic and non-academic factors offered new perspective on how to design college-retention efforts.

Student Engagement Theory

This section offers an exploration of the emergence of student engagement theory. While a multitude of theorists and researchers has contributed to the concept of student engagement, this exploration focuses upon some of the most major shifts in thinking over the past three decades that led to the current student-engagement construct. The theoretical contribution timeline is summarized below in Table 2.1:

Table 2.1: Major Contributions to Student Engagement Theory

<u>Theoretical Contribution</u>	<u>Theorist(s)</u>	<u>Year Introduced</u>
Student involvement	Astin	1975
Quality of effort	Pace	1979
Good practices in undergraduate education	Chickering & Gamson	1987
Social and academic integration	Tinto	1987
Student outcomes	Pascarella	1985
Student engagement	Kuh	1991

The notion of student involvement as it relates to success and persistence in college has been explored for decades. Astin (1984) defined a highly involved student as one who "devotes considerable energy to studying, spends much time on campus, participates actively in student organizations, and interacts frequently with faculty

members and other students” (p. 297). Those are examples of involvement, not a fully inclusive definition, meant to illustrate how involvement implies a behavioral component. The behavioral aspect of involvement theory centers upon the investment of a student’s physical and psychological energy along a continuum. The theory comprises both quantitative and qualitative features directly proportional to the amount of student learning and personal development associated with any educational program (Astin, 1984). The emphasis is on the active participation of a student in the learning process, and the role institutions play in fostering that participation. Students’ time is finite, and institutional policies and practices can impact the way students spend their time, such as by the amount of effort they devote to academic pursuits (Astin, 1984).

The concept of student involvement arose from a longitudinal study of college dropouts completed by Astin in 1975. Exploring factors that increased and reduced involvement, and demonstrating the relationship between involvement and persistence in college, Astin (1999) sought to articulate a theory of student development in part to address the lack of common vernacular in the field of higher education. Astin (1999) observed how those in academia treated the student as a “black box” by focusing on the input of institutional policies and programs and the output of achievement measures, while missing *how* those educational programs and policies are translated into student achievement and development. Astin (1999) defined the construct of student involvement as the amount of physical and psychological energy that a student devotes to the academic experience. While that did not deny that motivation or other “interior” factors were important in student development, the behavioral aspects were most critical since “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” (Astin, 1999, p. 519). That is, while there are similarities between the construct of student involvement and the construct of motivation, involvement was behavioral, and therefore more observable and measurable. In that student development model, the amount of student learning and development associated with any educational program is directly proportional to the quality and quantity of student involvement in that program, influenced by educational policies and practices.

Considering the finite nature of students’ time and energy, activities outside of the educational sphere represent a potential reduction in the time and energy a student has to devote to educational tasks. Subsequently, Astin (1999) emphasized how administrators and faculty members must recognize that every institutional policy and practice – attendance policies, office hours, location of buildings, on-campus employment opportunities, extracurricular activities – can impact the time and effort students allocate to academic pursuits. For example, off-campus and full-time employment may decrease the time and energy that a student can devote to studies and other campus activities. Astin (1999) concluded from his landmark 1977 study that nearly all forms of student involvement are associated with greater than average changes in the characteristics of entering freshman, and some involvement outcomes were more strongly associated with such change than either entering freshman characteristics or institutional characteristics. The emphasis again is on what students do upon entering college, not who they were prior to college.

In Astin's model, there is a sense of mutuality between a student and an institution. Similarly, Pace (1982) described the mutual accountability of students and institutions for student success:

[Colleges] are accountable for the resources and facilities, the programs and procedures, the stimuli and standards they provide for student learning and development. But surely the students are also accountable for the amount, scope, and quality of effort they invest in their own learning and development, and specifically, in using the facilities and opportunities that are available in the college setting. Accountability for achievement and related student outcomes must consider both what the institution offers and what the students do with those offerings. (pp. 1-2)

Pace (1982) expressed how both time and effort are important considerations in student learning and development, with time being a representation of frequency and effort being a dimension of quality. The College Student Experiences questionnaire, developed by Pace in 1979, included 14 quality-of-effort scales, along with items to determine relationships between quality of effort and achievement and elements that may explain those relationships (Pace, 1982). The final section of the questionnaire, Estimate of Gains, measures student beliefs concerning the achievement of higher education objectives. That raises the issue of credibility in regard to student self-reports, as there is no accompanying objective measure of achievement. Pace (1982) addressed that concern directly, explaining how, "In our total set of data there are many other examples of congruent or validating relationships between known facts and students' ratings.

Consequently, we can accept the self-reports of activities and the self-estimates of progress as broadly credible, valid, and true to the facts” (pp. 11-12).

Using a multiple-regression analysis of approximately 3,000 responses from 11 colleges and universities, Pace (1982) found that adding quality-of-effort measures to the traditional measures of student status, college status, and environment ratings, resulted in an additional 10 to 15 percentage points to the explained variance. While prior research held that student characteristics and background were the most important determinants of achievement, once students get to college what counts most is not who or where they are, but what they do (Pace, 1982). Grades do not tell “the whole truth”, as students who have high scores on the quality-of-effort scales related to academic/intellectual experiences make greater gains than students whose quality-of-effort scores are low, regardless of their grades (Pace, 1982). For example, “B- students with high quality-of-effort scores make more progress than B+ students with low quality-of-effort scores” (Pace, 1982, p. 19). When considering the dimensions of time and quality of effort, both are important, as breadth of involvement and breadth of attainments go hand in hand. However, time on task alone has weak explanative value. Students who spend more time at a low level of quality make less progress than those who spend fewer hours at a high level of quality; therefore, the more aspects of the college experience one participates in at above-average quality of effort, the more above-average progress is made in goal achievement (Pace, 1982). That contribution helped to illustrate the importance of student behaviors, yet student factors do not represent the entire equation that results in whether students persist and succeed in college.

Astin and Pace each emphasized how student behaviors influenced outcomes, but the realization the role that institutions played in the equation was also growing. In the mid-1980s, Arthur Chickering and Zelda Gamson, both board members of the American Association for Higher Education, attended the Wingspread Conference operated by the Johnson Foundation, along with authors of reports on undergraduate education and observers in higher education. Chickering and Gamson (1999) noted that, it became clear at the meeting how “the dissemination of a statement of principles could be timed to an undergraduate education reform movement that appeared to be sweeping the country” (p. 76). A task force was formed in 1986, comprising scholars who had researched the impact of the college experience and scholars of organizational, economic, and policy issues in higher education (Chickering & Gamson, 1999, p. 76). The task force adhered to the following tenet:

We insisted that whatever we produced be accessible, understandable, practical, and widely applicable. Although everyone agreed that faculty were the primary audience, several task force members also felt that we should try to reach campus administrators, state higher education agencies, and government policymakers.

The desire to reach multiple audiences reinforced the need to make the principles understandable and practical. (Chickering & Gamson, 1999, p. 76).

From the task force emerged the *Seven Principles for Good Practice in Undergraduate Education*, intended as guidelines for students, faculty, and administrators to improve teaching and learning.

The seven principles are based upon 50 years of research “on the way teachers teach and students learn, how students work and play with one another, and how students

and faculty talk to each other” (Chickering & Gamson, 1987, p. 2). While each of the principles can stand alone, effects of the principles multiply when all are present (Chickering & Gamson, 1987). The *Seven Principles* comprising good practice are:

- Encourages contact between students and faculty
- Develops reciprocity and cooperation among students
- Encourages active learning
- Gives prompt feedback
- Emphasizes time on task
- Communicates high expectations
- Respects diverse talents and ways of learning

Together, the principles employ six powerful forces in education: Activity, Expectations, Cooperation, Interaction, Diversity, and Responsibility (Chickering & Gamson, 1987).

Much like with Pace, the importance of time on task was emphasized, as, “Time plus energy equals learning. There is no substitute for time on task” (Chickering & Gamson, 1987, p. 5). Again, though, the concept of shared responsibility was raised:

While teachers and students hold the main responsibility for improving undergraduate education, the power to shape an environment favorable to good practice lies within institutional leaders, state and federal officials, and accrediting associations (Chickering & Gamson, 1987). Thus the theme of collaborative effort and shared responsibility continued to emerge.

The seven principles stressed the importance of the social aspect of involvement, specifically how learning is enhanced when it is more like a team effort than a solo race, more effective when collaborative and social instead of isolated (Chickering & Gamson,

1987). That social thread was picked up by Tinto (2004), who stated, “Students who are actively involved with peers, faculty, and staff – especially in learning activities – are more likely to learn, persist, and graduate” (p. 9). Recognizing some differences between commuter and residential students, Tinto (1997) noted how students in nonresidential settings need to attend to a multiplicity of obligations outside of college, and for those students going to college is one of a number of tasks to be completed. The classroom may be the only place where commuter students and faculty meet for the educational experience, especially for commuters who have multiple obligations outside of college, with the classroom being the primary avenue for establishing academic and social integration (Tinto, 1997).

To investigate the concept of the classroom as a community for involvement, Tinto (1997) studied the Coordinated Studies Program at Seattle Central Community College, comparing first-year students enrolled in CSP to those enrolled in non-CSP classes. The results indicated five significant predictors of persistence among students in the study: participation in the CSP, college GPA, hours studied per week, student perceptions of faculty, and the factor score on involvement with other students. The findings of the study revealed the potential to promote student involvement and achievement in settings where such involvement is not easily attained, such as the nonresidential undergraduate campus, and are summarized below:

- Participation in a shared learning experience, namely a learning community developed through the classroom environment, enabled new college students to meet social and academic needs without having to sacrifice one for the other.

- For some students, high levels of academic achievement may not be enough to offset the effect of social isolation, while for other students, sufficient social integration or involvement may counterbalance the absence of academic involvement.
- Membership in a classroom community provides important linkages to membership in communities external to the classroom. The academic sphere of the college experience occurs within the broader social system of the campus: social and academic lives are interwoven, with social communities emerging out of academic activities.
- Interactions across the academic and social geography shape the educational opportunity structure of campus life and, in turn, influence both student learning and persistence. (Tinto, 1997)

Those results reinforced Tinto's earlier assertion that "we must seek ways to integrate, not isolate, the academic and social experiences of students. To have one without the other is a mistake" (as cited in Spann, 1990, p. 22). Social interaction becomes part of the academic time on task of students.

Recognition of the quantity and quality of student initiative, paired with the effort of institutions to facilitate such initiative, continued to evolve. Kuh (2009) emphasized how student engagement represents the time and energy devoted by students, as well as what institutions do to induce students to participate in activities linked to desired college outcomes, defined as "educationally purposeful activities". How a student allocates time during college is a far greater predictor of success and persistence than are pre-enrollment characteristics:

Precollege characteristics such as academic achievement represented by ACT or SAT scores are strong predictors of first-year grades and persistence. However, once college experiences are taken into account – living on campus, enrollment status, working off campus, and so forth – the effects of precollege characteristics and experiences diminish considerably. (Kuh, 2009, p. 687)

According to Hayak and Kuh (2004), one of the “unequivocal conclusions” from the last half century of research on the impact of college students is that what matters more to success in the first year is what students actually do, not what institutions have in terms of resources such as facilities and faculty credentials (p. 11). It is not that institutional offerings are unimportant, rather the emphasis is upon how students avail themselves to institutional offerings. That is congruent with the mutuality between students and institutions as discussed earlier.

With any growing field of research, confusion about the meaning and scope of terminology can be of concern. Wolfe-Wendel, Ward, and Kinzie (2009) examined the concepts of involvement, engagement, and integration to provide common definitions and understandings of those terms. In a qualitative analysis of the literature on student engagement, involvement, and integration, Wolfe-Wendel et al. (2009) interviewed some of the originators of the concepts – Alexander Astin, Vincent Tinto, and George Kuh – as well as scholars who have applied the constructs in their research. The analysis provides not only distinction between common terms, but also a richer understanding of how the constructs relate to a consideration of student success and persistence in college.

A contribution of Astin’s theory of student involvement was the elaboration on the Input-Environment-Output model, offering involvement as an additional construct

between Environment and Outcome (Wolfe-Wendel et al., 2009). Pascarella (2001) had suggested that “something akin to [Astin’s] Input-Environment-Output approach could be invaluable in updating knowledge about those educational practices that predict important outcomes, even when controls are made for student input characteristics” (p. 23). Kuh introduced the concept of engagement in recognition that “involvement” – namely what students do with their time – alone is insufficient for advancing institutional efforts, as one needs to know what the institution is doing as well (Wolfe-Wendel et al., 2009). In distinguishing between engagement and involvement, student engagement is an expression of the importance of more explicitly linking student behaviors and effective educational practices. That is, engagement connects more directly than involvement to desired educational processes and outcomes, emphasizing action the institution can take to increase student engagement (Wolfe-Wendel et al., 2009).

The term “integration” is used to explain the extent to which students come to share the attitudes and beliefs of their peers and faculty, as well as the amount of adherence to rules and requirements of the institutional culture (Wolfe-Wendel et al., 2009). Social integration is described as students’ perceptions of interactions with their peer group, faculty, staff, and other institutional social constructs, while academic integration refers to perceptions of the experiences in the formal and informal academic system that enhance the intellectual development of the student (Wolfe-Wendel et al., 2009, p. 415). The concepts of academic and social integration are reciprocal between the student and the institution, with students departing from past cultural involvement to become integrated into a campus culture through the development of relationships and the establishment of a sense of belonging (Wolfe-Wendel et al., 2009). In an interview, Kuh

described the concept of integration as the connection between integration and involvement: "...you become integrated through involvement and engagement, by devoting efforts to things that promote positive outcomes... You don't get integrated academically or socially unless you do something. Integration is an outcome" (p. 419). It was suggested by Tinto that a good substitute for a term like integration is "sense of belonging", which includes both the connectedness to other people and how a student views those connections vis-à-vis other groups (Wolfe-Wendel et al., 2009).

Wolfe-Wendel et al. (2009) summarize the findings of their research into the following visualization of the concepts of involvement, integration, and engagement:

- Involvement is the responsibility of the individual student, though the environment plays a role. The unit of analysis for involvement is the student and his or her energy; it is the student who becomes involved.
- Integration involves a reciprocal relationship between the student and the campus. To become integrated, to feel like you belong, a student must learn and adopt the norms of the campus culture, but the institution is also transformed by that merger.
- The focus on engagement is on creating campus environments that are ripe with opportunities for students to be engaged. In most of the recent engagement research, the institution, not the student, is the unit of analysis. (p. 425)

Linking Engagement to Student Learning, GPA, and Persistence

Closely associated with the notion of integration, DeNeui (2003) examined students' psychological sense of community (PSC). DeNeui suggested that, in addition to total amount of participation in campus activities, the quality of participation may also

influence a student's PSC. While students who participate extensively may have higher PSC than student who do not participate, high participators will have a lower PSC than students who choose fewer activities, but invest more time in them (DeNeui, 2003). Considering that the majority of students' time is spent outside of class, strategies and partnerships between student affairs and academic affairs that tie together in-class and out-of-class experiences have great promise to increase student learning (Hu & Kuh, 2003; DeNeui, 2003).

Brown and Burdsal (2012) sought to develop a link between student success and sense of community, with "student success" defined in two ways: GPA and degree completion. Finding a reliable but minimal connection between sense of community and GPA, the researchers used a multiple regression analysis to understand how GPA was impacted by four sense-of-community factors: Campus Social Milieu, Divergent Thinking, Institutional Involvement, and Relationships (Brown & Burdsal, 2012). Results indicated that Institutional Involvement and Relationships both help predict GPA, particularly among students who have meaningful relationships, and are committed to their universities. Similarly, Institutional Involvement and Relationships contribute significantly to discriminating between students who do and do not complete a degree, with degree completion being associated with higher-quality relationships, and more involvement in the institution (Brown & Burdsal, 2012). Echoing the sentiments of previous researchers on the reciprocity of the student and the institution, Brown and Burdsal suggested:

universities that encourage the development of high-quality relationships between instructors and students and administrators and students, in addition to supporting

relationship development among students themselves, may see improvements in their graduation rates. Also, universities that motivate students to engage with campus organizations and committees or enroll in courses that demand more community involvement may see improvements in their graduation rates. (p. 445)

The question remains, however, how applicable those concepts are to online learning, since there was no direct measure of, or reference to, those phenomena in the virtual education realm. The following section will examine the available evidence to that end.

Social Interaction in the Online Classroom

The online classroom has been a growing phenomenon, and has been a subject of great interest in higher education. In February 2013, the U.S. Department of Education's Office of Educational Technology published *Expanding Evidence Approaches for Learning in a Digital World*. Much like the DOE meta-analysis results, the report focused primarily on the intrapersonal aspects of learning, such as how technology can assist the processes of individuation, differentiation, and personalization of the educational experience (Cator & Adams, 2013). According to the report, it is well established that "a state of modest alertness...enhances learning and that students tend to learn better when they feel an emotional closeness to their instructor" (Cator & Adams, 2013, p. 31). That assertion was followed by a synopsis of efforts to design automated tutoring software, along with the bulk of the report's focus upon the individual learner. Turning to the interpersonal realms, one of the final recommendations of the report states, "R&D funding should be increased for studying the noncognitive aspects of 21st-century skills, namely interpersonal skills (such as communication, collaboration, and leadership) and intrapersonal skills (such as persistence and self-regulation)" (Cator & Adams, 2013, p.

85). The report suggested that such skill development may relate to positive outcomes such as increased earnings, better health, and greater civic engagement. The added emphasis on the interpersonal aspect of learning is consistent with research on student success and persistence among college students.

Some researchers have investigated the motivation for students to pursue online learning, as well as differences between online learners. Chen, Gonyea and Kuh (2008) compared the engagement of distance learners in educational practices with that of their campus-based counterparts at four-year degree-granting colleges and universities in the United States, addressing the following three research questions:

1. Why do distance learners take online courses?
2. What are the engagement patterns, self-reported learning and personal development outcomes, and satisfaction levels of distance learners versus campus-based learners?
3. What are the engagement patterns, self-reported learning and personal development outcomes, and satisfaction levels of traditional-age (24 years old and younger) versus adult (older than 25 years) distance learners?

In the design of the study, distance learners were identified by asking the question, “Thinking about this current academic term, are you taking all courses entirely online?” Of those who answered “yes” to this question, 3,894 students at 367 American four-year colleges and universities were included in the sample. More than two-fifths (44 percent) of first-year, and half of the senior-year distance-education learners were enrolled part-time, compared with only 4 percent of first-year and 13 percent of senior campus-based learners. (Chen et al., 2008). The sample of distance learners was also older, with a mean

age of 25 for the first-year students and 32 for the seniors, as compared to 18 and 22 for the respective means of on-campus learners. That provides some additional evidence that “adult learners” may be drawn to online learning at higher rates than traditional-age students.

The results indicated that distance learners generally scored higher than their campus counterparts in some areas, including levels of academic challenge, but were less engaged in active and collaborative learning. More specifically, the lower-level of engagement appeared in two areas: working with other students on projects during class, and working with classmates outside of class to prepare class assignments. Those are experiences typically associated with desired outcomes of college such as satisfaction, persistence, and intellectual and social development (Chen et al., 2008). The researchers suggested that more literature is needed in the field regarding online active and collaborative learning, and its impact upon distance learners’ college outcomes in terms of intellectual gains, persistence, and personal and social development (Chen et al., 2008). The researchers also questioned whether low levels of active and collaborative learning opportunities for distance learners could negatively affect their performances in the workplace or other aspects of their lives, such as the interpersonal skills and practical competencies required by the 21st-century workplace (Chen et al., 2008).

Certain design aspects of the study create potential complications in answering the original research questions. First, during the data-collection period, a student enrolled in one online course would qualify for inclusion in the sample, even if enrolled in a program that will entail face-to-face courses for completion of the undergraduate degree. Secondly, in the analysis of the data, the researchers appear to aggregate all distance

learners in the sample as compared to all on-campus learners, despite the disproportionate number of part-time distance learners. Therefore, while the aim was to clarify the relationship between engagement and online learning, the sampling and terminology of the study may exacerbate the confusion in the field. A broader question is how social interactions online compare with social interactions in the classroom. That is a potential concern because application of brick-and-mortar paradigms to online learning experiences may be ineffective or even counterproductive. The issues associated with cross attributions such as that are discussed in Chapter V.

Other researchers have applied the interpersonal lens to better understand the online learning environment. Slagter van Tryon and Bishop (2012) assert that a key factor in predicting online course successes is the extent to which students in online learning environments perceive themselves as being socially connected to their peers. The underlying process involved in the development of social connectedness is social cognition, providing context and shaping behavior through the expectations that participants have of one another's intentions and predicted "next moves" during an encounter (Slagter van Tryon & Bishop, 2012). That again points to the importance of interpersonal factors in online courses, both in terms of the success of the learner, and the development of interpersonal skills within the online learning environment.

One facet of social connectedness is a sense of belonging, similar to the notion of integration discussed earlier. Studies of students' online experiences suggest that many online courses lack a sense of social presence, defined as "the projection of an authentic persona that connects to others involved in the course" (Jaggers, 2011, p. 20). Students who take online courses may miss out on experiences that connect them with faculty and

students, potentially leading to isolation and decreased persistence as compared with face-to-face courses (Bejerano, 2008; Jaggars, 2011). Acknowledging online learning challenges such as a sense of isolation and general lack of support, Jaggars (2011) concludes that researchers need to isolate the key elements and mechanisms of effective non-instructional supports, and identify instructional behaviors and activities that encourage student engagement, motivation, retention, and learning. Even as campus administrators and faculty become more aware of the benefits of integration, many students are not aware of the importance of academic and social integration when enrolling in online courses (Bejerano, 2008).

Student Engagement and the NSSE

In 2000, the field of higher education was at ready for an instrument such as the National Survey of Student Engagement (NSSE). Regarding the timing of the NSSE's inception, it was noted:

Policymakers were growing increasingly impatient with an ongoing yet unsustainable pattern of cost escalation, skepticism was building about how much students were learning in college, and regional accreditors were ratcheting up their demands upon colleges and universities to adopt assessment for purposes of improvement. (Gonyea, Kinzie, & McCormick, 2013, p. 1)

Those educationally purposeful activities are precisely the foci of the NSSE. Since the inception of the instrument in 2000, more than a million first-year students and seniors at more than 1,100 four-year colleges and universities have reported the time and energy that they devote to the educationally purposeful activities measured by the annual survey (Chen, Gonyea, & Kuh, 2008).

Exploring the conceptual roots of the NSSE offers insight into its intended scope and purposes. Kuh (2001) described how the instrument emerged from the conversation about educational effectiveness. Following the establishment of the *Seven Principles of Good Practice in Undergraduate Education*, the National Education Goals Panel led a series of conversations on how to promote the measurement and use of such practices. The Pew Charitable Trusts facilitated a group discussion in February 1998 on the topic of college rankings, from which the idea emerged of an annual assessment of how institutions were using the effective educational practices identified in the literature. The instrument was ready for field testing in 1998, with the first national administration launched in the spring of 2000. The NSSE is administered directly to random samples of first-year and senior students at participating institutions, a process facilitated by an independent third party: the Indiana University Center for Survey Research. The purpose of the NSSE, and the recipients of its results, are key considerations.

Kuh (2009) noted how, in the absence of actual measures of student learning, student engagement data such as those provided by the NSSE can serve as proxies or “process indicators” for learning outcomes. In addition to providing actionable data to institutions, the NSSE was designed to discover more about effective educational practices in postsecondary settings, and to advocate for public acceptance and use of empirically derived conceptions of collegiate quality (Kuh, 2009). Institutions can compare their data with those from other institutions, and have the option to link student responses with their own institutional data. While institutions cannot change who students are when they start college, an assessment tool such as the NSSE can help

institutions identify areas where improvements in teaching and learning will increase the likelihood of their students achieving educational and personal goals (Kuh, 2009).

In order to link student learning outcomes to the educational activities and processes associated with them, institutions need an understanding of how students are allocating their time, and those data are provided directly from the NSSE. The NSSE includes the provision of actionable information – behaviors and experiences – that institutions can influence. On a macro-level, the NSSE has advanced awareness and understanding of the important role of student engagement in higher education assessment and improvement, with the widely known NSSE benchmarks being commonly invoked in higher education research and practice (Hu & McCormick, 2012). What the NSSE offers campuses, though, are descriptive statistics regarding NSSE scores. The important distinction between descriptive statistics and inferential statistics in the interpretation of NSSE results is discussed in Chapter V.

Pascarella, Seifert, and Blaich (2009) studied whether good practices in undergraduate education as measured by NSSE benchmarks actually predict important educational outcomes. Using a longitudinal pre-test/-post-test approach, the researchers identified five liberal arts outcomes: Effective Reasoning and Problem Solving, Moral Character, Inclination to Inquire and Lifelong Learning, Intercultural Effectiveness, and Personal Well-Being. The units of analysis were 19 institutions from 11 states participating in the Wabash study, based upon data from the Critical Thinking Test, the Defining Issues Test, and the NSSE. Results indicated that institutional-level NSSE benchmark scores had a significant overall positive association with the seven liberal arts outcomes at the end of the first year, controlling for the differences in the average pre-test

score of the entering student population (Pascarella et al., 2009). The findings support the claim that the NSSE results serve as an effective proxy for measures in growth in important educational outcomes. Therefore, institutions using the NSSE can have reasonable confidence that the benchmarks measure experiences that facilitate such growth, and can influence those experiences through changes in institutional policies and practices (Pascarella et al., 2009).

LaNasa, Cabrera, and Trangsrud (2009) suggested that the predictive nature of the NSSE is well established in the literature, and sought to explore the overall fit of the NSSE benchmarks to a single institution's data to establish construct validity. Factor analysis of each NSSE benchmark indicated several items with loadings less than .70, suggesting that much of the variance for the indicators within the benchmarks was left unexplained (LaNasa et al., 2009). That led the researchers to conduct an exploratory factor analysis of 37 NSSE items, which yielded a nine-factor solution, eliminating one (Working Collaboratively In Class) because of its relative weakness and composition of only two items (LaNasa et al., 2009). The remaining eight-factor model of student engagement, distinct from the five benchmark descriptions utilized by NSSE researchers, offered a substantial improvement across a range of fit statistics, but did contain high levels of error (LaNasa et al, 2009). While the overall results did not suggest the original five NSSE benchmarks were without relevance, the researchers noted that a more comprehensive depiction than the five benchmarks may be required to facilitate institutional change and understanding (LaNasa et al, 2009). That aligns with an early assertion by Kuh (2001) that the greatest impact and utility of NSSE data comes from integration with other institutional data about the student experience.

One notable trend is how expectations among incoming students may not be aligned with the realities of academic demands. According to NSSE data from 2005, approximately 60 percent of first-year students expected to spend more than fifteen hours a week studying, but only 40 percent did so, with 30 percent of first-year students reporting working just hard enough to get by (Kuh, 2007). The 2005 NSSE data also indicated how the vast majority of incoming undergraduates expected to participate in cocurricular activities, yet 32 percent spent no time doing so in their first year; 40 percent to 50 percent of those first-year students did not use career planning, financial advising, or academic tutoring services (Kuh, 2007). Those figures serve as a reminder of how students may arrive with expectations, but it is what they do that ultimately matters.

Data from the NSSE were central to the methodology of this study. The pervasiveness and repetition of administration are indicators of the NSSE being a trusted measure in the field. Of the initial group of 276 institutions from the year 2000, 93 percent administered the survey in NSSE's tenth year or later (Gonyea et al., 2013). With more than 620 participating campuses, approximately 1.6 million undergraduates were invited to complete the NSSE in 2013. At institutions that intentionally put the NSSE results to use, there have been notable increases in student engagement. A 2009 sample from more than 200 institutions showed that more than 40 percent had a significant positive trend in at least one engagement measure for first-year students, and 28 percent had a positive trend for seniors (Gonyea et al., 2013). A similar analysis of 400 institutions was completed in 2012, confirming the earlier finding of gains in engagement trends over a longer time frame. Findings suggest that the positive trends are the result of factors such as intentional efforts by the institutions, an institutional commitment to

improving undergraduate education, attention to data that reveal a need for improvement, and faculty or staff interest in improving undergraduate education (Gonyea et al., 2013).

In 2009, an initiative was launched to update the NSSE to add specificity and adapt the language to reflect changes in the educational experience. Approximately 80 institutions of higher education assisted with the process, resulting in a shift from the familiar five NSSE Benchmarks to a new set of ten “Engagement Indicators” embedded with broad themes that echo the Benchmarks (Gonyea et al., 2013, p. 5). The new Engagement Indicators incorporate more of the engagement-related questions than the original Benchmarks, and “combine high face validity with a more coherent framework and specific measures for the improvement of teaching and learning” (Gonyea et al., 2013, p. 5). The update was completed for the administration of the 2013 NSSE, with new measures such as quantitative reasoning, perceptions of effective teaching practice, and collaborative learning activities (Gonyea et al., 2013). The updated NSSE items more specifically target intentional and productive out-of-class intellectual engagement, emphasizing collaborative learning and help-seeking behaviors (Gonyea et al., 2013). Some of the NSSE item language was also changed to be more inclusive of the online learning environment.

Connecting the NSSE with Success Outcomes

Previous studies have attempted to connect NSSE results to students’ academic performance, including the predictive value of NSSE results to collegiate outcomes such as GPA. Seeking to determine the extent to which student engagement relates to traditional measures of academic performance, Carini, Kuh, and Klein (2006) examined forms of student engagement associated with learning. Those measures included RAND

tests, essay prompts from the Graduate Record Examination, and college GPA. The sample included students from 14 four-year colleges and universities in 2002, with student engagement measured through administration of the NSSE. To more accurately isolate possible effects of student engagement on learning, the researchers statistically controlled for students' SAT scores, along with several student demographic variables. Findings indicate that the greatest impact of institutional interventions to boost student engagement may be on those most at risk for leaving college prematurely (Carini et al., 2006). For example, college students with the lowest SAT scores appeared to benefit more from student engagement than did those with the highest SAT scores, which suggests there may be a compensatory effect of student engagement (Carini et al., 2006).

Kuh, Cruce, Shoup, Kinzie, and Gonyea (2008) explored the relationships between key student behaviors and the institutional practices and conditions that foster student success, measured by GPA and student persistence. Student-level records were merged from different types of colleges and universities, controlling for the net effects of student background, pre-college experiences, prior academic achievements, and other first-year experiences. The data were gathered from eighteen baccalaureate-granting institutions that administered the NSSE at least once between 2000 and 2003, with only first-year students included in the analysis. Student engagement was represented by three NSSE survey measures: time spent in co-curricular activities, time spent studying, and a global measure of engagement comprising nineteen other NSSE items. One of the findings was that the advantage in first-year GPA for students who had higher grades in high school was not as pronounced for students who only studied for five or fewer hours per week in their first year of college (Kuh et al., 2008). Engagement in educationally

purposeful activities had a small, compensatory effect on first-year GPA of students who entered college with lower levels of academic achievement. That demonstrated the assertion that what students do once they are in college does matter, particular among those students who may not be as academically accomplished based on high-school achievement.

On the issue of persistence from the first to second year of college, results found that engagement in educationally purposeful activities during the first year of college had a positive, statistically significant effect on persistence “even after controlling for background characteristics, other college experiences during the first year of college, academic achievement, and financial aid” (Kuh et al., 2008, p. 551). As with other studies, however, there is some question about persistence rate based upon the timing of NSSE administration. The 85 percent persistence rate of students in the study was high, likely due in part to an unknown number of first-year students leaving prior to the spring term when the NSSE was administered (Kuh et al., 2008). The results of any survey administration have the potential to be confounded by the snapshot-in-time dynamic in relation to a more longitudinal measure such as GPA. The notion of attrition bias will be discussed in further detail in relation to the current study.

Recognizing that NSSE scores represent a moment of time during a student’s first year or senior year in college as compared to the cumulative nature of GPA, Fuller et al. (2011) examined the methodology of research regarding NSSE results and GPA. The researchers explored the usefulness and validity of cross-sectional and longitudinal models for predicting student GPA at the time of degree completion by tracking 127 students who took the NSSE in their freshman year and again in their senior year. Thus

those students who did not persist to degree completion were excluded from the study. While both cross-sectional and longitudinal models explained a modest proportion of variance in final GPA, the study did not yield statistically significant results for the NSSE benchmark predictors (Fuller et al., 2011). The researchers noted that the institution from which the data were derived is a selective institution with increasingly competitive admissions, and that significant relations between NSSE benchmark scores and GPA may be found among less-competitive institutions (Fuller et al., 2011). That could indicate a ceiling effect of NSSE indicators upon GPA among higher-performing students, which would align with the earlier discussion on how the compensatory effect of engagement may be more profound for lower-performing incoming students.

By examining the relationship between engagement and persistence, the concept of engagement can be further delineated as academic engagement and social engagement. Hu (2011) obtained a data sample from the Washington Education Foundation (WEF) comprising 832 applicants to the Washington State Achievers (WSA) scholarship program, with 58.3 percent of the sample being WSA recipients and 41.7 percent being non-recipients. A baseline survey was administered at the end of the applicants' first year out of high school and the first year students were in college, and the first follow-up survey was conducted three years after high school graduation, or the third year of college. The majority of the items on the survey were drawn from instruments such as the NSSE, with four items measuring social and community engagement: (1) participation in events sponsored by a fraternity or sorority, (2) participation in residence hall activities, (3) participation in events or activities sponsored by groups reflecting a student's own cultural heritage, and (4) participation in community service activities (Hu, 2011).

In the analysis of the data, Hu (2011) used a principal component factor analysis to determine the underlying factors of student engagement, differentiating between academic engagement and social engagement. The results indicate that, taken alone, neither academic engagement nor social engagement scores were statistically significant in relation to student persistence in college (Hu, 2011). However, some significant differences were found, namely that:

students with low levels of both academic engagement and social engagement were less likely to persist, students with low or middle levels of academic engagement but high-level social engagement were more likely to persist, students with high-level academic engagement but low- or middle-level social engagement were less likely to persist, and students with high levels of both academic and social engagements were more likely to persist. (Hu, 2011, p. 104)

The relationship between student engagement in educationally purposeful activities and the probability of persisting is not linear; in fact, the results indicate that an increased level of academic engagement, when not accompanied by high-level social engagement, is negatively related to student persistence (Hu, 2011). Those findings are consistent with some earlier research. In a study by Kuh in 2000, the 15 percent of college students who devoted a considerable amount of time and effort to academic activities but not much to other college activities were called “grinds”, having persisted at a rate of only 62.8 percent (Hu, 2011). Academic and social engagement play different roles in the eventual success of students in college, with the role of social engagement in student persistence being a consideration in designing and implementing campus programs to promote student success (Hu, 2011). Therefore, the mentality of “the more the better” regarding

student engagement may warrant some re-examination, along with the embedded assumption of the linearity between student engagement and student outcomes (Hu, 2011).

Student satisfaction is another aspect often associated with student success and persistence. Webber, Krylow, and Zhang (2013) examined the relationship between student engagement in college activities and two measures of student success: the objective measure of cumulative GPA, and the subjective measure of students' perceived satisfaction with their institutions. The study sample comprised 2008 NSSE survey responses from 1,269 students attending a Mid-Atlantic state institution. One general finding was that students who reported more frequent engagement in academic and social activities earned higher grades, along with higher levels of satisfaction with their college experiences (Webber et al., 2013). A potential limitation of the study is bias among NSSE respondents, as response to the survey may be confounded with academic motivation.

If students with stronger GPAs and high satisfaction are more likely to graduate, it behooves college officials to provide resources and other support for activities associated with student engagement such as group work outside of the classroom, and discussion with faculty and peers (Webber et al., 2013). Such examples of social integration may largely be a function of the psychological size of an institution, which in turn can be influenced by factors such as formation of peer groups, high-quality advising, and small-group instruction (Webber et al., 2013). With more students enrolling in college part-time or in more distance-based courses, the challenge for academic and student affairs administrators is to develop additional innovative ways to get part-time and distance-

based students involved (Webber et al., 2013). That sentiment echoes the shared responsibility discussed earlier: the institution providing opportunities for involvement, and the students taking the initiative to actively participate. There are multiple entry points for participation beyond attendance at campus activities or joining a student organization. The participation aspect of engagement includes interaction between a student and his or her faculty, academic advisor, and other staff members working in various service offices at an institution. All of the individuals in those roles can forge connections with a student, which in turn can connect the student to the institution.

Distinguishing between Traditional-Aged and Adult Learners

There is a broader question for this research: is the construct of student engagement, as measured by the NSSE, equally relevant for all student populations? It can be informative to first explore differences between two groups often discussed in the higher education field: traditional-aged students and adult learners. Are those groups affected equally by the same experiences in higher education, or even place equal value on aspects of the college experience such as socialization and educational attainment? According to Bean and Metzner (1985), older students are less susceptible to socialization than their traditional-aged counterparts, as they have already developed self-control and values associated with maturity. For nontraditional students, the academic reasons for attending college may take precedence over social reasons. Bean and Metzner's (1985) definition of "academic" is not one of scholarly intent, rather "those factors associated with taking courses for vocational, avocational, certification, or other utilitarian reasons" (p. 489). That is, nontraditional students emphasize utilitarian outcomes more than social outcomes, and that utility is a greater influence on decisions

concerning college attendance (Bean & Metzner, 1985). While some of the more influential models of understanding student attrition rely heavily upon socialization, that model asserted that the lack of social integration by a nontraditional student into an institution calls for a different theory.

This new model does not represent a complete disregard of all elements from traditional models of student attrition. Elements of previous theoretical frameworks preserved in the model concerning dropout decisions include: poor academic performance; intent to leave; background and variables such as high school performance and educational goals; and environmental variables (Bean & Metzner, 1985). An emphasis is placed upon environmental support for the nontraditional student, since for nontraditional students it can compensate for weak academic support, but Bean and Metzner (1985) stressed how academic support will not compensate for weak environmental support. Psychological outcomes are critical for nontraditional students, outcomes which may carry more weight than academic performance (Bean & Metzner, 1985). For example, nontraditional students with a high GPA may still choose to leave school if they perceive low levels of utility, satisfaction, goal commitment, or if they have high stress levels. Similarly, nontraditional students with low GPAs may remain enrolled if they perceive positive psychological outcomes from attendance (Bean & Metzner, 1985).

Other critics suggested that socialization may not be as important for adult learners as for traditional-age students. According to Rovai (2003), Tinto's social integration model is not as useful for studying the attrition of older students, usually associated with living away from campus, belonging to social groups that are not

associated with college, having dependents, not being involved in campus organizations, and attending college part-time. Instead, Rovai (2003) offers a composite model synthesizing Tinto's work along with the framework proposed by Bean and Metzner. In the model both internal and external factors related to persistence are outlined, with students' involvement in, and attachment to, their schools still being seen as essential elements for success (Rovai, 2003). Persistence may be seriously weakened by external factors when institutional academic and social systems are weak, along with life crises such as illness and loss of job (Rovai, 2003). Institutional leaders face the challenge of how to engage and support different student populations that may be impacted differently by varying degrees of engagement (Wyatt, 2011). Similarly, the challenge becomes how to even measure engagement in a manner reflective of the experiences of learners at different points of the developmental continuum.

NSSE and the Adult Learner

The discussion regarding differences between traditional-aged and adult learners led to an exploration of how student success is measured among the groups. Lerer and Talley (2010) argued that three of the five NSSE benchmarks are not appropriate for assessing the quality of education for all college students, as those benchmarks mix items reflecting expectations associated with more traditional students with those more universal educational-experiences focusing on academics, classroom activities, and institutional support. Utilitarian value of the undergraduate education for nontraditional students was raised again by Lerer and Talley (2010), who stated,

Nontraditional students, who are usually older, live and work off-campus and have families and responsibilities not related to their experiences as students, do

not seek the same outcomes from their education as traditional college students. They tend to focus on academics, and do not have the time (or perhaps the inclination) to participate in off-campus activities or interactions outside the classroom. (p. 357)

Testing their argument, the researchers created two groups, traditional and nontraditional students, from a sample of seniors at Adelphi University. Traditional students were defined as younger than 25 who started at Adelphi as freshmen, and nontraditional students were defined as older than 30 who started at the institution as transfers. According to the findings, the three NSSE benchmarks potentially biased toward traditional college students were Student-Faculty Interaction, Active and Collaborative Learning, and Enriching Educational Experiences. Lerer and Talley (2010) recommended that NSSE restructure the benchmarks to be more universally applicable across student populations, or to exclude items from its benchmarks that are potentially biased towards traditional students.

The model of student engagement being assessed by the NSSE may fail to account for the psychological components of engagement in learning for adults (Price & Baker, 2012). That echoes Bean and Metzner's (1985) view of the psychological value of education for the nontraditional student. Price and Baker (2012) attempted to learn how nontraditional students scored on NSSE benchmarks as compared with traditional-aged counterparts, hypothesizing that adult learners would score lower on NSSE items deemed more applicable to traditional students due to the focus on out-of-classroom or nonacademic experiences. The study sample included seniors attending a small, private, southern four-year institution. Most of the adult students, defined for the study as being

age 23 or older at the time of first enrollment, attended classes in the evenings and weekends in the college's adult degree-program. In contrast, the traditional-age students enrolled at the college were primarily full time and living on campus. The study found that adult students scored significantly lower on 20 of the core survey items, suggesting a lower level of social and academic engagement (Price & Baker, 2012). It was suggested that adult students engage in the college experience differently than traditional students, possibly due in part to the adult students' emphasis upon gaining new skills and knowledge (Price & Baker, 2012). That aligns with the concept of educational utility among nontraditional student proposed by previous researchers (Bean & Metzner, 1985; Lerer & Talley, 2010). While differences between traditional and nontraditional learners is not a focus of this study, the question regarding universal applicability of the NSSE is an important one to explore. The question includes whether the NSSE is an appropriate measure of engagement among those students in online learning environments.

Application of the NSSE to the Online Learning Environment

NSSE researchers recognized that the growth of online learning has altered the landscape of undergraduate education, responding with modifications in question wording that might have previously implied a physical classroom setting (Gonyea et al., 2013). For example, the question prompting students to share how often they "*Asked questions in class or contributed to class discussions*" became "*Asked questions or contributed to course discussions in any way*" in the revised instrument (NSSE). An optional topical module, *Learning with Technology*, was created for the examination of the role of technology in student learning, meant to complement questions on the NSSE

survey regarding issues such as learning with peers and quality of interactions with others (NSSE). Sample questions from the topical module are:

- *During the current school year, how much have your courses improved your understanding and use of technology?*
- *During the current school year, about how often have you used the following technologies in your courses?*
- *During the current school year, about how often have you used technology to communicate with the following people (Students, Academic advisors, Faculty, Student services staff, Other administrative staff and offices)? (NSSE)*

There is a distinction, though, between asking broad questions about the use of technology and targeting the online learning environment. The importance of that distinction is revisited in Chapter V.

There is precedent for using the NSSE as an indicator of engagement in the online learning environment. Robinson and Hullinger (2008) noted that the NSSE was originally created for on-campus education, yet argued that the *Seven Principles of Good Practice in Undergraduate Education* serves as NSSE's foundation, principles that have been widely applied to online learning. They designed a study that applied dimensions of the NSSE to measure engagement of students in online courses, including the administration of a modified version of the NSSE based upon the applicability of each question to the online learning environment. That applicability was determined through a review of literature "regarding the deployment of Internet technology in the teaching-learning process and with careful attention to the guidelines by Chickering and Ehrmann [for implementing the *Seven Principles* of practice]" (Robinson & Hullinger, 2008, p.

102). The sample for the descriptive study was selected from three universities, with students enrolled in at least one fully online course.

The study found differences among subgroups within the sample. Students who accomplished an average of an “A” grade and students who reported a high level of satisfaction with their university experience “reported higher levels of engagement in academic efforts and greater gains in educational outcomes” (Robinson & Hullinger, 2008, p. 106). Examples included greater gains in academic skill development, more interaction with faculty, more engagement in online discussions, and increased abilities to work effectively with others and solve real-world problems (Robinson & Hullinger, 2008). That is, students who were more engaged tended to be more accomplished and satisfied. Results also indicated that older students, as defined by the researchers as at least 25 years of age, centered online discussions solely on course-related matters as opposed to using online discussions for social interactions like their younger counterparts (Robinson & Hullinger, 2008). That again supports the earlier notion that nontraditional students are more motivated by utilitarian factors than social factors in the college experience (Bean & Metzner, 1985; Lerer & Talley, 2010; Price & Baker, 2012), and may be a factor in nontraditional students seeking out online learning experiences.

Chen, Lambert, and Guidry (2010) selected the NSSE as the data source to examine the possible relationship between the use of technology in a course and the level of student engagement, as well as individual characteristics potentially associated with the choice to take online courses. The NSSE was completed by 17,819 students from forty-five institutions, along with the NSSE online learning questions (Chen et al., 2010). Only 2.1 percent of the 17,819 reported taking all of their courses fully online, with the

majority taking classes with at least some face-to-face component (Chen et al., 2010).

The study found that certain types of students, including racial and ethnic minorities and part-time students, are more likely to take online courses (Chen et al., 2010). For students choosing the online pathway to a college education, the researchers asserted, “If the reason is for mere convenience – and our guess is it probably is – then institutions must ensure that online students receive high quality instruction, support services, and other fringe benefits enjoyed by traditional face-to-face students” (Chen et al., 2010, p. 1229).

The risk of not making such efforts can result in another form of unintended consequence: educational segregation as increasing numbers of minority, part-time, and working students disproportionately elect to take online courses, potentially not receiving the same quality of education as their traditional-classroom counterparts (Chen et al., 2010).

In regard to the relationship between the use of technology and level of engagement, multiple regression analyses yielded mixed results. The students’ use of learning technology explained the largest portion of the variance in NSSE benchmark scores, ranging from 19.1 percent to 32.1 percent for first-year students and 19.0 percent to 26.2 percent for seniors (Chen et al., 2010). In contrast, the delivery method of the courses in which students were enrolled (online, hybrid, face-to-face) had an unsubstantial impact on the variance in NSSE scores, despite having statistical significance (Chen et al., 2010). The majority of students in the study had classes that were entirely or partially in the classroom, with few enrolled in all online courses, and few in hybrid-only or hybrid and online classes. Much like the NSSE topical module discussed earlier, the findings point to the potential impact of technology upon student

engagement, not necessarily the role of engagement when the delivery method of courses is online.

While online learning began as an avenue for access to education, the issues discussed thus far demonstrate the level of complexity with understanding and measuring the educational experience of online learners. Some types of students may be drawn to online education disproportionately, and distinctions between student groups are not prominent in the national discussion regarding online learning. The emphasis is not just on the quality of online education, but on the possible need for different approaches to educating, engaging, and supporting distinct types of students in online coursework. As discussed earlier about the brick-and-mortar undergraduate experience, the focus on online student engagement does not place the entire burden upon the student, rather shares responsibility among student, faculty, and institution (Robinson & Hullinger, 2008). One aspect of engagement as a measure of student behavior is the degree to which a student takes advantage of resources available by the institution, since student engagement indicates what the student does with such resources (Robinson & Hullinger, 2008). That argument concerning online learners is similar to that made by Astin, Pace, Tinto, and Kuh regarding learners in traditional undergraduate settings.

As illustrated in this chapter, there is wide agreement in the field of higher education that student engagement is a predictor of student achievement, success, and persistence. With the ongoing pressure to demonstrate institutional efforts to provide a quality undergraduate experience and facilitate higher levels of degree completion, it is understandable that campus administrators would apply the measure of student engagement as a litmus test of the quality of online education. The inherent assumption is

that, if high levels of student engagement are associated with success among face-to-face learners, it would be an important emphasis for online learners as well. However, there has not been much empirical evidence to date on whether that is accurate. This study explores the validity of the perspective that student engagement, embodied by a construct created for campus-based learning, is critical for the success and persistence of students enrolled in online undergraduate experiences.

CHAPTER III: METHODOLOGY

The purpose, rationale, and procedures for the analytic methods employed in the study are presented in this chapter. It begins with a discussion of how quantitative design was appropriate for the study, and a review of the research questions and terminology. That is followed by an exploration of the survey instrument selected, namely the National Survey of Student Engagement, including a description of the original instrument and its revisions, the validity and reliability of the instrument, and evidence supporting the application of the instrument for answering the research questions. The process for data gathering and preparation is outlined, along with data decisions made by the researcher. The results of both factor analysis and checks of reliability for the NSSE Engagement Indicators are described to build a rationale for the appropriateness of the Engagement Indicators in the study of the data sample. A descriptive data summary is provided. Finally, the chapter concludes with the delimitations to clarify parameters of what is and is not explored in the study.

Purpose of the Study

There are two contributions of this study: one is very specific to online learners, and the other a broader application to the literature concerning the role of student engagement in student success and persistence toward completing an undergraduate degree. This study also contributes to the understanding of the role of engagement in online learning for different populations of undergraduates. Student engagement is the construct used to explore the efficacy of online learning, with engagement being well established in the literature as associated with student success and persistence. The purpose of this study was to explore the relationship between level of student engagement

and the rates of success and persistence among students enrolled in online undergraduate coursework. It also aimed to inform educators and policymakers in the creation of academic programs and campus structures intended to increase access to higher education, and increase degree attainment among learners. To that end, this study examined the degree to which the widely administered NSSE can offer administrators and policymakers information that leads to action regarding student engagement in the online undergraduate experience. The intent was to apply a rigorous test to the NSSE model for online learners, and to the assumption that student engagement is as critical for online learners as it has historically been for face-to-face learners.

Rationale for Quantitative Ex Post Facto Design

Much of the student success and persistence research entailing use of the NSSE has been quantitative: surveys, factor analysis of the surveys, and predictions based upon the surveys. Based upon the research questions, a quantitative design allowed for the analysis of the characteristics of learners and their success and persistence in online learning environments, both from a descriptive and relational standpoint. The unit of analysis for this study is the group of students enrolled in online undergraduate coursework, not individual students. That serves as part of the rationale for a quantitative design. In terms of the NSSE, the instrument itself gathers data coded in a quantitative manner, and provides scores for clusters of questions in the form of “Engagement Indicators” to represent levels of engagement. For this study, two numerical data points were selected as indicators of success and persistence: GPA and number of semesters enrolled in online undergraduate coursework. Chambers (2010) noted that, “While NSSE is highly respected and broadly administered throughout higher education, most, if not

all, of the analyses of NSSE data have been conducted on the quantitative responses to its survey items” (p. 4). Chambers (2010) explored the open-ended responses of undergraduate students to the question at the end of the NSSE survey, “*Do you have any other comments?*” (original italics, p. 4). While this study was institution-specific, it serves as a reminder of how the NSSE provides both quantitative and qualitative data for campuses to analyze. However, this study did not include analysis of the open-ended qualitative NSSE responses from students.

Type of Quantitative Design

The design of the study is based upon survey research, specifically the use of the NSSE, combined with non-experimental, correlational analyses. According to Creswell (2009), survey research provides “a quantitative or numeric description of trends, attitudes, or opinions of a population by studying a sample of that population” (p. 12). The sample in this study comprised students enrolled in online undergraduate coursework who completed the NSSE in the 2013-2014 cycles. The research was ex post facto, utilizing existing data to describe student behaviors, beliefs and attitudes. Ex post facto research is ideal for conducting social research when is not possible or acceptable to manipulate the characteristics of human participants, and is a substitute for true experimental research that can be used to test hypotheses about cause and effect or correlational relationships (Simon & Goes, 2013). This study did not divide subjects into experimental groups, manipulate conditions, or apply a treatment.

Research Questions

Two overarching questions were established for this study. The research questions were:

1. What is the relationship between student engagement and persistence in online undergraduate coursework?
2. What is the relationship between student engagement and success in online undergraduate coursework?

Hypotheses

The null hypothesis was the test of significance for this study. Applying the null hypothesis to the research questions, the following were the null hypotheses statements:

1. There will be no significant relationship between student engagement and persistence (as measured by enrollment beyond two semesters) among undergraduates enrolled in primarily online coursework.
2. There will be no significant relationship between student engagement and success (as measured by GPA) among undergraduates enrolled in primarily online coursework.

Operational Definitions

- **Traditional-age students** are undergraduate students between the ages of 18 and 25, while **adult students** (interchangeable with **nontraditional students**) are older than 25 years.
- **Online learning** describes undergraduate courses comprising for-credit semester-long learning experiences, delivered entirely through web-based modalities. The term intentionally excludes blended learning, which inherently involves some face-to-face contact with peers and the faculty. Learning experiences not equating to a semester-long course of at least three credits are also excluded.

- An **online learner** is defined as an undergraduate student having taken at least 50 percent of coursework online. A student must be enrolled in at least two online courses per semester to participate in the study, allowing for the inclusion of part-time students.
- **Success** is measured by cumulative grade point average (GPA), as it is often representative of “good academic standing” at many institutions of higher education.
- **Persistence** is demonstrated by enrollment in at least three consecutive academic semesters at the same institution of higher education, with a credit load of at least six credits per semester.
- **Engagement** is defined as a critical threshold of time students allocate to educationally purposeful activities, measured by the National Survey of Student Engagement (NSSE). NSSE Engagement Indicator scores will represent the concept of engagement.

Instrumentation: The National Survey of Student Engagement (NSSE)

Description of the NSSE

The NSSE was selected as the data collection instrument for this study for several reasons. First, the NSSE is widely accepted as an indicator of a key construct for this research, namely the notion of student engagement. Secondly, the instrument captures data on an array of campus practices and student behaviors that potentially pertain to online learning environments, not just the physical campus experience. A third reason for selecting the NSSE is the amount of existing data amassed from administering the instrument at multiple campuses over several years. Lastly, because of the pervasive use

of the NSSE, this study offers possible insight regarding how to measure student engagement in the expanding realm of online learning, and whether such a construct adds value to the conversation.

Initiated in 2000, The NSSE is administered at American and Canadian institutions of higher education under the coordination of the Indiana University Center for Postsecondary Research in Bloomington. First-year college students and students in their senior year are invited to complete the NSSE. The NSSE questionnaire items fall within five categories: participation in educationally purposeful activities, requirements of the institution as embodied in course work, perceptions of the college environment, background demographic information, and self-estimated personal growth since starting college (Kuh, 2009). Together, those five areas are designed to inform campuses about how institutional conditions impact student learning and development (Kuh, 2009)

The NSSE is available in paper and Web versions and takes about 15 minutes to complete (Sausser, 2011). The instrument is designed to assess the extent to which students are engaged in good educational practices, as well as what students gain from the college experience (Fuller, Wilson, & Tobin 2011). The items are short and behaviorally based for college students to rate on scales ranging from two to seven points using a simple “mark the box” format (Sausser, 2011). Several questions ask respondents to select from a “Very often” to “Never” Likert Scale for questions such as, “*During the current school year, about how often have you had discussions with people from the following groups?*” Other items are measured in numerical increments for questions such as, “*About how many hours do you spend in a typical 7-day week doing the following?*” Campuses receive both student-level and aggregate data for the purpose of

their own analyses, ranging from cohort studies to multi-year studies of institutional NSSE responses.

As a means of summarizing approximately half of the NSSE questions, the original NSSE assigned “benchmark” scores as the primary focus of attention and dialogue for measuring student engagement. The five NSSE Benchmarks of Effective Educational Practice were: (1) Level of Academic Challenge, (2) Active and Collaborative Learning, (3) Student-Faculty Interactions, (4) Enriching Educational Experiences, and (5) Supportive Campus Environment (Fuller et al. 2011). Below is a brief description of each of the original benchmarks:

- ***Level of Academic Challenge*** was an eleven-item scale regarding academic time-on-task of a student, along with the student’s perceptions of institutional expectations for academic performance.
- ***Active and Collaborative Learning*** comprised seven items, such as inquiring about working with other students inside and outside of class, taking advantage of tutoring services, and being involved in community-based activities.
- The ***Student-Faculty Interaction*** scale grouped six items, including student reports on the nature and extent of contact with faculty and advisors, as well as how promptly faculty provided feedback.
- The ***Enriching Educational Experiences*** scale represented twelve items such as interaction with students from different backgrounds, use of information technology, and participation in activities like internships and community service.

- The *Supportive Campus Environment* scale had six items measuring the extent to which a student feels the institution helps him or her succeed academically and socially (Kuh, 2010, p. 18).

The Benchmarks were conceived as clusters of student behaviors and institutional actions, allowing for a concise summarization in facilitating conversations on improving undergraduate education (Pike, 2013).

As part of the ongoing revision effort, NSSE replaced the five Benchmarks in 2013 with Engagement Indicators. The new measures offered more “targeted and concrete summaries of different facets of student engagement” (NSSE, 2013, p. 4). Items from the original NSSE were tested along with modified and new items, and then grouped accordingly within ten Engagement Indicators to represent broad dimensions of student learning and development (NSSE, 2013). The Engagement Indicators were organized into four themes adapted from the former Benchmarks, outlined in Table 3.1.

Table 3.1: Themes of the NSSE Engagement Indicators

Theme	Engagement Indicator
Academic Challenge	Higher-Order Learning Reflective & Integrative Learning Learning Strategies Quantitative Reasoning
Learning with Peers	Collaborative Learning Discussions with Diverse Others
Experience with Faculty	Student-Faculty Interaction Effective Teaching Practices
Campus Environment	Quality of Interactions Supportive Campus Environment

NSSE also began to report differently on enriching educational experiences, unbundling indicators from the Benchmark to report separately on High-Impact Practices such as participating in learning communities, service learning, research with a faculty member,

internships, and study abroad (NSSE, 2013). Each item within an Engagement Indicator was recoded to a 60-point range (Never=0, Sometimes=20, Often=40, Very Often=60), and a student's EI score was calculated as the average score across individual items (NSSE, 2013). In the next section, the validity and reliability are examined for the NSSE as a cohesive instrument, the individual NSSE benchmarks, and the more recent Engagement Indicators.

Validity and Reliability of the NSSE

Validity

This section examines the validity of the NSSE. Validity refers to the degree to which a scale measures what it is intended to measure (Pallant, 2013). The Center for Postsecondary Research offers evidence of several types of validity for the NSSE, including response process validity, content validity, construct validity, concurrent validity, and predictive validity. Validity reports are provided by an online psychometric portfolio on the center's site for the NSSE. Three areas of validity hold particular relevance for this study: content validity, construct validity, and predictive validity. The evidence offered for each will be summarized, along with some general discussion to distinguish between each type of validity.

Content validity is the extent to which an instrument is representative of all of the scales or constructs it is intended to measure (NSSE). That is, content validity is about how well an instrument measures a construct: in the case of the NSSE the construct is student engagement. A researcher establishes content validity by showing that test items are "a sample of a universe in which the investigator is interested" (Cronbach & Meehl, 1955, p. 282). In other words, content validity refers to the adequacy with which a

measure or scale has sampled from the intended universe or domain (Pallant, 2013). The domain of student engagement emerged over time, a 70-year evolution from student time on task, quality of effort, student involvement, social and academic integration, good practices in undergraduate education, student outcomes, and finally, student engagement (Kuh, 2009). As mentioned earlier, the NSSE instrument is designed to gather information representative of that well-developed notion of engagement as reflected in student participation in educationally purposeful activities, requirements of an institution as embodied in course work, perceptions of college environment, background demographic information of the student, and self-estimated personal growth since starting college.

Construct validity is about the operationalization of a concept through the gathering of observable data to reflect the underlying phenomenon (NSSE). That is, construct validity represents how well the group of items actually measures the intended theoretical concept. A “construct” is a postulated attribute of people, assumed to be reflected in test performance (Cronbach & Meehl, 1955). In the case of the NSSE, student engagement would be considered the construct. For a test designed to measure a construct, evidence of homogeneity among items in the test helps to establish validity, accomplished by item intercorrelation; however, intercorrelation supports construct validity only in cases where the underlying theory of the trait being measured calls for high item-correlations (Cronbach & Meehl, 1955). Ultimately, if prediction and observable results are in harmony, the construct is at best adopted, but not actually demonstrated to be “correct”: a user can accept a test as a measure of a construct only when there is a strong positive fit between predictions and subsequent data (Cronbach &

Meehl, 1955). But a key consideration for the validity of an instrument is how it operates when applied to different groups, such as the application of the construct to the online student population in this study.

As a test of construct validity, both exploratory and confirmatory factor-analysis techniques were used to examine responses from a 2009 sample of NSSE data. The sample comprised responses from 160,755 first-year and 175,936 senior students from 617 colleges and universities. The scale selected for validating internal structure was the Deep Learning Scale, which has three subscales: Higher-Order Learning, Integrative Learning, and Reflective Learning. Those three factors cumulatively explained approximately 60 percent of the variance for the survey items contained in the subscales, and the factor loadings were relatively strong for all three factors: Higher-Order Learning, Integrative Learning, and Reflective Learning. Fit indices were greater than .95 for both the first-year model and senior model. These findings indicate that the items on the Deep Learning scale are measuring the intended construct of deep learning. The data are summarized in Table 3.2, replicated from the NSSE website:

Table 3.2: NSSE 2009 Deep Learning Factor Analysis

Items	First-Year			Senior		
	Factor 1	Factor 2	Factor 3	Factor 1	Factor 2	Factor 3
Higher Order Learning						
synthesz	.84			.84		
analyze	.81			.81		
applying	.79			.80		
evaluate	.79					
Reflective Learning						
othrview		.86			.87	
ownview		.84			.85	
chngrview		.79			.79	
Integrative learning						
integrat			.75			.86
divclass			.75			.74
intideas			.68			.68
facideas			.59			.59
oocideas		.52	.54			.58
Percent Variance Explained	38.32	11.71	8.72	38.96	12.45	8.50

Predictive validity is the extent to which a score on a scale or instrument predicts scores on some other anticipated criterion measure (NSSE). In other words, predictive validity is established when a scale can predictively correlate with other outcome measures. To that end, NSSE initiated its *Connecting the Dots* (CTD) project to explore relationships between student engagement as measured by the NSSE and selected measures of success in college, namely GPA and persistence. The project examined student-level data for approximately 11,000 first-year and senior students from 18 institutions of higher education, including students' NSSE responses, academic transcripts, and ACT/SAT scores. The researchers controlled for a variety of pre-college and first-year experience variables (NSSE). Logistic regression was used for modeling effects of student time on task and engagement on GPA, and persistence to the second year at the same institution.

The results indicated a small but statistically significant effect of student engagement on first-year grades, with one standard-deviation increase in engagement increasing GPA by approximately .04 points. Student engagement had a statistically significant impact upon persistence, with the probability of returning to a second year of college being .91, if a standard deviation was above average versus a .85 probability of returning if engagement was below average. For seniors, those studying at least 21 hours per week had a GPA .04 points higher than peers studying less. For every standard deviation increase in the global student-engagement scale, students earned a GPA of .03 points higher. Together, the results indicate a small but significant predictive increase in student success and persistence outcomes associated with NSSE scores.

Reliability

Reliability refers to the consistency or stability of a measurement: use of a reliable instrument implies that the data and results are reproducible (NSSE). The Center for Postsecondary Research provides evidence on measures of reliability, including internal consistency and temporal stability. Internal consistency is “the extent to which a group of items measure the same construct, as evidenced by how well they vary together, or intercorrelate” (NSSE). According to Pallant (2013), the most commonly used statistic for measuring internal consistency is Cronbach’s coefficient alpha, providing an indication of average correlation between all the items that make up the scale. Cronbach alpha values range from 0 to 1, with higher values indicating greater reliability and a suggested minimum level of .7 depending upon the scale (Pallant, 2013).

To construct the internal consistency statistics for the NSSE, a random sample was drawn from 136,397 first-year students and 199,346 seniors from 568 institutions in

the United States. Results were weighted by gender, enrollment status, and institution size. Table 3.3 summarizes the intercorrelation between items within each measurement scale, both for first-year students (FY) and seniors (SR). The table indicates whether a scale is one of the broader NSSE benchmarks, a scale, or subscale. The number of items on each scale is listed, as Cronbach's alpha values are sensitive to the number of items in the scale, shorter scales having lower values such as .5 (Pallant, 2013). Taken as a whole, the NSSE appears to have a high level of internal consistency.

Table 3.3: NSSE Internal Stability (Benchmarks, Scales, Subscales)

Measurement Scale	Items	α (FY)	α (SR)
Benchmark: Level of Academic Challenge	11	.73	.76
Benchmark: Active and Collaborative Learning	7	.67	.67
Benchmark: Student-Faculty Interaction	6	.71	.74
Benchmark: Enriching Educational Experiences	12	.60	.66
Benchmark: Supportive Campus Environment	6	.79	.80
Deep Learning Scale	12	.85	.86
Higher-Order Learning Subscale	4	.82	.83
Integrative Learning Subscale	5	.70	.72
Reflective Learning Subscale	3	.80	.80
Campus Environment: Environment Emphases	7	.81	.80
Campus Environment: Quality Campus Relationships	3	.74	.72
Satisfaction: Overall Satisfaction	2	.76	.81
Satisfaction: Satisfaction plus Quality of Campus Relationships	6	.82	.83
Student Self-Reported Gains: Practical Competence	5	.83	.82
Student Self-Reported Gains: General Education	4	.84	.84
Student Self-Reported Gains: Personal and Social Development	7	.87	.88

Temporal stability, also known as test-retest reliability, is assessed by administering a scale to the same respondents on two occasions and calculating the correlation between the two scores (Pallant, 2013). The unit of analysis for the NSSE is a group, which can be an entire NSSE respondent pool or a subgroup of the respondents. To measure temporal stability, The Center for Postsecondary Research analyzed the NSSE benchmark scores for 231 institutions that participated in both the 2010 and 2011 survey administrations. Pearson's r was used to quantify correlations, comparing each

institution's 2010 NSSE benchmark scores to its 2011 scores. The Pearson's r can range from -1 to 1 to indicate the strength of a relationship between variables, with a 0 representing no relationship, and a -1 or a 1 representing a perfect correlation (Pallant, 2013). When interpreting values between 0 and 1, Cohen (1988) suggests the following guidelines:

- Small: $r = .10$ to $.29$
- Medium: $r = .30$ -. 49
- Large: $r = .50$ to $.10$ (pp. 79-81)

In the 2011 study, the values of Pearson's r ranged from $.749$ for first-year Student-Faculty Interaction to $.924$ for senior Enriching Educational Experiences (NSSE). Table 3.4 summarizes the correlations between the 2010 and 2011 benchmark scores by class for each of the five NSSE benchmarks:

Table 3.4: NSSE Temporal Stability

	Level of Academic Challenge	Active and Collaborative Learning	Student-Faculty Interaction	Enriching Educational Experiences	Supportive Campus Environment
First-Years	.786	.811	.749	.816	.754
Seniors	.790	.803	.893	.924	.799

Using the guidelines cited above for determining the strength of relationship, all of the Pearson's r results fall within the large correlation range. That indicates a strong correlation between the two years of NSSE scores, and suggests temporal stability for institutional-level NSSE benchmark scores.

The extent to which the NSSE has been studied is another indicator of its status in the field of higher education. Additional information concerning the validity and reliability of the NSSE is provided by the *Mental Measurements Yearbook with Tests in*

Print. In 2011, Sauser and Sheehan separately reviewed the NSSE. According to Sauser (2011), “All in all, evidence indicates that the NSSE is a psychometrically sound instrument for the uses for which it was designed, measures what it is intended to measure, and yields interpretable benchmark scores for comparison across institutions” (p. 4). Such evidence includes correlations of concordance of institutional benchmark scores (ranging from .83 to .92), statistically significant sample t-tests (ranging from .60 to .96), and temporal stability represented by a coefficient of .83. Sheehan (2011) noted the NSSE’s consistent reliability data, thorough validity analyses, and efforts made to assess accuracy of students’ self-reported data. The review concluded that, “Overall, the psychometric evidence presented indicates the NSSE can accomplish its purpose – to assess student engagement along several dimensions” (Sheehan, 2011, p. 6). What the review does not offer is a discussion of using the NSSE with different populations, such as online learners. In the design of this study, the researcher’s conversations with NSSE researchers indicated that cognitive research testing and studies on the validity for online learners have been conducted, but the applicability of the NSSE to online learners has not been thoroughly researched (Kinzie, J., personal communication, April 10, 2014; BrckaLorenz, A., personal communication, May 6, 2015).

With the introduction of the Engagement Indicators for the updated version of the NSSE, the internal consistency again was tested, the results of which are listed on the Psychometric Portfolio section of the NSSE website. Results were based upon students selected from 622 institutions in the United States who responded to NSSE in 2014, a sample comprising 152,818 first-year students and 2013,071 seniors. Table 3.5 outlines the 2014 findings for internal consistency of each Engagement Indicator by class level:

Table 3.5: NSSE Engagement Indicator Internal Stability

Engagement Indicator	Items	α (FY)	α (SR)
Higher-Order Learning	4	.85	.86
Reflective & Integrative Learning	7	.88	.88
Learning Strategies	3	.76	.78
Quantitative Reasoning	3	.86	.87
Collaborative Learning	4	.81	.81
Discussions with Diverse Others	4	.89	.90
Student-Faculty Interaction	4	.83	.85
Effective Teaching Practices	5	.84	.87
Quality of Interactions	5	.84	.81
Supportive Campus Environment	8	.89	.89

All ten of the Engagement Indicators had a Cronbach's alpha of above .5, even with small numbers of items within each. Much like the NSSE versions prior to 2013, the revised NSSE appears to have a high level of internal consistency.

Evidence Supporting the Use of the NSSE

Pike (2013) explained that many studies focusing on the validity of survey data fail to consider the intended uses of the data. For example, institutions and subgroups, not individual students, are the appropriate unit of analysis, and studies using students as units of analysis demonstrate that the survey should not be used in ways never intended (Pike, 2013). To explore the criterion validity of the NSSE as an educational measure, Pike (2013) studied the adequacy and appropriateness of using the NSSE benchmark scores for institutional assessment and improvement, consistent with the assertion regarding unit of analysis. Pike (2013) postulated that, "A finding that benchmark scores are related to institutional retention and graduation rates would suggest that the benchmarks can serve as proxies for institutional programs and practices that enhance student success above and beyond the characteristics of the institutions themselves" (p. 157). Data for the study came from the 2008 administration of the NSSE, with a sample of students from 524 colleges and universities with 50 or more first-year student

respondents, and 586 institutions with 50 or more senior respondents. Students who took all courses through distance education were excluded.

Summarizing the study results, Pike (2013) reported two overall findings regarding the NSSE as measuring the construct of student engagement:

1. NSSE benchmarks can produce dependable measures of student engagement in good educational practices with as few as 50 students
2. NSSE institutional benchmark scores are significantly related to institutional retention and graduation rates, net the effects of institutional characteristics. (Pike, 2013, p. 163)

Pike (2013) argued that “the content of the NSSE benchmarks should represent good educational practice, the structure of the benchmarks should be consistent with their specifications, and NSSE benchmarks should be related to measures of student success” (p. 151). The multiple regression analysis in the study did indicate that 69 percent of variance in institutions’ one-year retention rates could be accounted for by the model, along with 75 percent of the variance in the institutions’ average six-year graduation rates (Pike, 2013). It is important to note, though, the inclusion of other factors in the model, such as the selectivity of the institution, the proportion of underrepresented minorities, and the proportion of full-time students.

Initially asserting how an individual student is not intended as the unit of analysis, Pike (2013) reaffirmed that the NSSE is a dependable lens for institutional assessment, as well as for gauging the engagement of student subgroups. That is, the NSSE indicators are appropriate for assessment and evaluation of groups, not for evaluating or predicting the academic success of individual students (Pike, 2013). In designing a study of online

undergraduates, it would be consistent with that assertion to focus upon the overall relationship of NSSE scores among online learners to the overall GPAs and persistence rates of those learners. An important consideration may also be the other potential influences upon persistence, as well as the subgroups within a campus population.

Sampling, Data Gathering, and Data Preparation Procedures

A non-random purposeful sampling approach was utilized in this study. The initial sample (N=672) was obtained from campuses within a public university system in a rural state in the northeastern United States. Each of the campuses in the sample offered both face-to-face and online undergraduate coursework. While some of the students had been enrolled in online coursework entirely through one campus, others had been enrolled in courses from multiple campuses. That provided additional rationale for exploring all campuses in the system offering online undergraduate coursework, as a student may have taken online courses at one campus but completed the NSSE in response to an invitation from another campus. Some campuses had administered the NSSE in spring 2013, others in spring 2014. Multi-year NSSE responses were warranted to assure a large enough sample size for analysis. Sampling from multiple institutions in the state system increased the likelihood of obtaining a robust sample, while also strengthened the anonymity of any one campus' online coursework, which alone might have had a low and identifiable set of responses. With the most rapid growth of online learning occurring within traditionally "brick and mortar" colleges and universities, the decision was made to focus on online experiences offered at such institutions instead of virtual institutions.

All students who were enrolled in online undergraduate coursework within the campus system who had also completed the NSSE within the 2013-2014 cycles were initially included in the study. Campus-level NSSE data were obtained directly from each of the five participating institutions. Student demographic and performance data were obtained at the system-level administrative office. The data were: GPA, enrollment status (first-time versus transfer student), credit load, gender, Pell Grant eligibility, and age. All of the raw data sets were secured by a third party to assure the researcher could not identify any participant in the study. A statistician at the Center for Education Policy, Applied Research and Evaluation at the University of Southern Maine served in that capacity. The statistician matched the student-level NSSE responses from the campuses with the student-level demographic information from the system office, and de-identified the respondents through the replacement of system-assigned student ID numbers with unique case codes. The campus-level data sets were then merged into one large data set, and released for analysis in this study.

Sampling: Defining Group Characteristics

The sample comprised undergraduate students who responded to the NSSE during either the 2013 or 2014 administration at any of the five institutions, N=672. The total time frame for those in the cohorts was enrollment from the fall 2012 semester through the end of the spring 2014 semester. As mentioned earlier, the mobility between campuses among the collective student population offered rationale for analyzing the sample as one combined group instead of five different cohorts. The threshold for being assigned to the “online student” population was defined as a minimum of 50 percent of all courses taken since the fall of 2012 having been online courses. That was calculated

by dividing the total number of online courses taken between the start of the fall 2012 semester through the end of the spring 2014 semester by the total number of any courses during the time period, $N=138$. The 50-percent definition of online learner was consistent with the definition used by the institution in this study with the highest number of online learners. As discussed later, one of the limitations of the study is created by the potential effects of face-to-face courses taken by those who were not fully online during the semesters included.

Another decision was how to potentially account for the attrition bias in the sample. That is, with the NSSE being administered on a spring-semester cycle, students most at risk of dropping out may not have persisted to the point in the academic year at which the instrument measures student engagement. Related to that was a GPA in the sample heavily skewed above 2.0, with a mean of 3.23 and a skew of -1.83, creating a challenge for statistical analysis based upon normal distribution. Indeed, it comes into question whether GPA is normally distributed nationally, with much of the distribution occurring between 2.0 and 4.0. The choice was made to eliminate any students from the sample who had not achieved at least a 2.0 cumulative GPA. The result was the reduction of the skew in cumulative GPA (-.73), offering a more normal distribution for the analysis.

When providing results to campuses and when reporting on national trends, NSSE separates the freshman and seniors into different data points, as the instrument is administered to both populations at a campus simultaneously. For this study, seniors were not included, as the definition of persistence entailed at least three consecutive semesters of enrollment. All students who reported “senior” status as a response to the NSSE were

excluded from the study. Students who reported “sophomore” or “junior” status were included in the study, mainly due to the transfer phenomenon among the institutions sampled. For example, if a student was in the initial year of enrollment at an institution, yet had transferred in enough credits, he or she could be a sophomore or junior in terms of credit status, but to measure the student experience may have been invited to take the NSSE as part of the freshman cohort. Since the emphasis on persistence from one semester to another is not limited to the freshman-to-sophomore-year transition, only seniors were eliminated from the sample. That will be mentioned again in the discussion regarding missing data, as additional decisions needed to be made for inclusion in the sample based upon class status.

Average classes taken per semester was established as the measure to determine if a student was part time or full time. A cutoff of three classes per semester was selected to indicate full-time status. One reason is because students may vary the number of courses taken each semester, but the cumulative view speaks to the amount of time dedicated towards degree completion. Secondly, some students take non-credit developmental courses that would not count towards the total classes taken in any given semester, yet would count towards eligibility for financial aid or competing on an NCAA athletic team. Having a cutoff of three courses allows for the fourth to be developmental. *Adult learner* was defined earlier as to whether the student was 25 or older at the time of taking the NSSE. With a combined sample of two NSSE years, it was determined to calculate that as current age being 26 or older to account for the most recent NSSE administration in the spring of 2014. Another variable, *GPASuccess*, represents binned ranges of GPA for some additional comparison groups, particularly for use in the descriptive comparisons

between online students and non-online students. The GPA ranges, which were particularly useful in the descriptive comparisons between online and non-online students, are as follows:

- 2.0-2.66
- 2.661-3.00
- 3.001-3.33
- 3.331-3.665
- 3.666-4.0
- Above 4.0

Data Analysis Procedures

As a non-experimental research design using survey data, the analysis relied upon multivariate statistics. Data was analyzed using the IBM SPSS © version 22 statistical software package. Using multivariate statistical techniques allows for the revealing and assessment of complex interrelationships among variables for the purpose of statistical inference (Tabachnick & Fidell, 2001). Descriptive statistics were generated to explore characteristics of the overall sample obtained. That included an analysis of the demographics of those who completed the NSSE from each institution to determine the level of homogeneity across the online undergraduate programs from an intercampus perspective. That is, the study examined whether there are significant demographic differences between the samples obtained from each participating institution within the system that may pose a threat to using aggregated data for answering the research questions. Analysis of the descriptive statistics also determined the amount of

homogeneity within each campus sample, as over- or under-represented demographics can create additional limitations to the study.

Factor analysis by NSSE led to the establishment of the new Engagement Indicators. Factor analysis is a technique that allows for data summarization, also known as data reduction, to be able to use a smaller set of components (Pallant, 2013). Factor analysis therefore allows for a more viable and detailed examination of data sets with large numbers of variables. The technique involves looking for inter-correlations between items that could allow for clumping data into groups (Pallant, 2013), which is particularly important for an instrument such as the NSSE, due to the large number of variables. Factor analysis was employed in this study to determine if using the existing NSSE Engagement Indicators was appropriate for the data samples in this study, not to identify other potential components for examination. SPSS syntax from the NSSE website was downloaded, and run with the sample to group the appropriate questions for the creation and scoring of the Engagement Indicators.

While the reliability of the NSSE Engagement Indicators has been established, the reliability of any scale can vary depending upon the sample (Pallant, 2013). Reliability tests were performed for each of the Engagement Indicators, both with the online student sample and the sample of non-online students. The study proceeded with the analysis of groups and with regressions to explore that complex framework of student engagement. Statistical analyses using t-test and Chi Square were used to determine if any of the demographic variables were acting as intervening variables with GPA and persistence. T-tests were employed for examination of the continuous GPA variable based on gender, age, and Pell Grant eligibility. Chi Square was used to examine the categorical variable of

student persistence beyond two semesters with those same demographic variables. To answer the research questions, the relationship between GPA and student engagement (as measured by the NSSE Engagement Indicators) was accomplished through multiple regression, while the relationship between persistence and engagement was examined through logistic regression.

Checking the Coherence of Each NSSE Engagement Indicator

The purpose of using factor analysis in this study was not to examine all of the questions included in the NSSE instrument for item reduction. Rather, the study aimed to apply the existing and widely disseminated Engagement Indicators to the samples. To that end, the Engagement Indicators were subjected to principal component analysis (PCA) for both the online and non-online samples. That diagnostic step was taken for each sample separately, and for each Engagement Indicator separately. Prior to performing PCA, the suitability of the data for factor analysis was assessed. The correlation matrices for the Engagement Indicators revealed coefficients that were consistently above .3. The Kaiser-Meyer Olkin (KMO) values all exceeded the value of .6 recommended by Kaiser (as cited in Pallant, 2013), and Bartlett's Test of Sphericity reached statistical significance (Bartlett, as cited in Pallant, 2013).

Principal component analyses identified the presence of only one component per Engagement Indicator with eigenvalues exceeding 1. The KMO values, significance indicated by the Bartlett's Test, the eigenvalues, and the explained variance for each Engagement Indicator are listed in Table 3.6 for both the online and non-online student samples. The results confirmed that each of the Engagement Indicators was reduced to a single component based upon the questions assigned by NSSE. That reaffirmed the

decision to employ the Engagement Indicators as the predictor variables for studying the outcome variables of GPA and persistence instead of taking an exploratory approach to search for other factors comprised of questions from NSSE.

Table 3.6: Factor Analysis Results of the Engagement Indicators

NSSE Engagement Indicator	Kaiser-Meyer Olkin Values	Bartlett's Test	Eigenvalue	Total % of Variance Explained
Higher-Order Learning	.820	.000	3.192	79.81
Reflective and Integrative Learning	.839	.000	4.026	57.52
Learning Strategies	.664	.000	2.195	73.16
Quantitative Reasoning	.712	.000	2.361	78.68
Collaborative Learning	.809	.000	2.767	69.17
Discussions with Diverse Others	.845	.000	3.282	82.05
Student-Faculty Interactions	.796	.000	2.891	72.28
Effective Teaching Practices	.822	.000	3.515	70.29
Quality of Interactions	.748	.000	2.892	57.84
Supportive Environment	.894	.000	5.297	66.21

Reliability Check of NSSE Engagement Indicators

Each of the NSSE Engagement Indicators serves as a subscale of the overall NSSE instrument. The researcher tested the reliability of each Engagement Indicator for both the online student sample and the non-online sample. Within each Engagement Indicator, there were no negative values when the items assigned to the Engagement Indicator were inter-correlated. As discussed earlier, a Cronbach's alpha value above .7 suggests very good internal consistency reliability for a sample. Table 3.7 summarizes the alpha values for each of the Engagement Indicators for the sample.

Table 3.7: Engagement Indicator Internal Stability

Engagement Indicator	Items	α
Higher-Order Learning	4	.92
Reflective & Integrative Learning	7	.88
Learning Strategies	3	.81
Quantitative Reasoning	3	.86
Collaborative Learning	4	.85
Discussions with Diverse Others	4	.93
Student-Faculty Interaction	4	.87
Effective Teaching Practices	5	.89
Quality of Interactions	5	.81
Supportive Campus Environment	8	.93

To determine if all of the items in the scale are to remain in a scale, the “Alpha if Item Deleted” values should be lower than the final alpha value (Pallant, 2013). All of the “Alpha if Item Deleted” values were lower than the alpha values from Table 4.2 except for the following:

- Learning Strategies: the alpha for the item “*Identified key information from reading assignments*” was higher (.87) than the final alpha value (.81) for the scale.
- Discussions with Diverse Others: the alpha for the item “*Had discussions with people of a race or ethnicity other than your own*” was higher (.94) than the final alpha value (.93) for the scale.
- Quality of Interactions: the alpha for the item “*Quality of interactions with academic advisor*” was higher (.82) than the final alpha value (.81).
- Supportive Environment: the alpha for the item “*Institutional emphasis: Helping you manage your non-academic responsibilities*” was higher (.94) than the final alpha value (.93).

It is a decision faced by a researcher of whether or not to remove an item from a scale in such cases. Since the Engagement Indicators are established and validated measures, it

was decided to not remove the item in order to maintain generalizability with other studies. The overall results demonstrated strong reliability for each of the Engagement Indicators.

Missing Data

One of the issues faced in social science research is missing data. In this study, there were no data missing for the demographic variables analyzed, including gender, age, Pell Grant eligibility, enrollment status, cumulative GPA, and persistence. However, examination of the cases included in the calculation of each Engagement Indicator score revealed some missing data for consideration. Tabachnick and Fidell (2001) emphasized the importance of deciding how to handle missing data, but noted, “Unfortunately, there are as yet no firm guidelines for how much missing data can be tolerated for a sample of a given size” (p. 59). Enders (2003) stated that a missing rate of 15 to 20 percent was common in educational and psychological studies. In this study, six of the ten Engagement Indicators had less than 6 percent of cases missing for the calculations of scale scores. Two of the ten Engagement Indicators had at 8 percent of cases missing from the calculation of the scale score, and two had higher than 16 percent missing, the highest being 29 percent for Quality of Interactions.

The Quality of Interactions scale was affected by the calculation in the syntax from NSSE. To determine Engagement Indicator scores on the scales with five or more items, a mean was calculated for each student who answered all items or all but one of the items in the Engagement Indicator (NSSE). For those scales with fewer than five items, a student must have answered all of the items to have a scale score calculated (NSSE). The missing data range on the five questions included in the Quality of

Interactions scale was from 8.1 percent to 9.4 percent. However, this is the only scale that allows respondents to choose “*Not Applicable*” as a response. Four of the five questions had N/A responses ranging from 3.6 percent to 5.1 percent. The remaining question, “*Quality of interactions with student services staff*”, the N/A responses accounted for 39.9 percent. Without a clear understanding of how removing one question from an Engagement Indicator scale would impact the intent of the scale, the decision was made to include the Quality of Interactions scale in the analysis. The full description of the missing data for the Engagement Indicators is summarized in Appendix B.

As mentioned earlier, students who indicated a class standing of “senior” at the time of NSSE administration were removed from the sample. All of the “Unclassified/Other” responses were examined (n=21), as well as missing responses for the class standing question (n=35). Any student who had completed 90 credits or more was eliminated from the sample, as that is the threshold for the end of the junior year among the campuses used to construct the sample. The result was a sample of 150 students who had completed at least half of their undergraduate coursework online. There were an additional 12 online students with a pattern of missing data throughout the questions across the Engagement Indicators, so those students were also removed from the sample for a final online sample size of 138 (N=138).

Descriptive Statistics

The research questions in this study are centered on online learners, defined earlier as those who have completed at least 50 percent of undergraduate coursework online during the time frame of the two NSSE cohorts. To examine if the online sample had distinctly different characteristics from the non-online students among the five

participating institutions in the study, comparisons of key demographic variables were performed. The variables were age, adult or traditional-age learner, gender, Pell Grant eligibility, and enrollment status (full time or part time). Table 3.8 summarizes the comparison between online and non-online students on those measures:

Table 3.8: Demographic Comparison of Online and Non-Online Students

Online Status	Current Age		Learners		Gender		Pell Grant	Enrollment Status	
	Mean	SD	Adult %	Trad %	Male %	Female %	Eligible %	Full Time %	Part Time %
Online (N=138)	38.76	11.09	87.0	13.0	23.2	76.8	67.4	56.5	43.5
Non-Online (N=534)	28.33	11.18	37.5	62.5	32.2	67.8	62.5	85.4	14.6

The mean age of online learners is older ($M=38.76$) than that of the non-online learners ($M=28.33$). When age is categorized into traditional-age learners (under the age of 26) and adult learners (26 and older), the age difference becomes even more notable. The online sample comprised 87.0 percent adult learners, as compared to only 37.5 percent of adult learners in the non-online cohort. That disparity appears to be consistent with the research to date outlined in Chapter II on how the majority of online learners tend to be older. The percentage of females in the online sample is larger than the non-online, 76.8 percent to 67.8 percent respectively. The larger percentage of online students who are Pell Grant eligible (67.4 percent) indicates how students in a lower socioeconomic status may be drawn in higher proportions to online learning environments, consistent with the literature summarized in Chapter II. There was a smaller percentage of full-time students among the online students (56.5 percent) than among the non-online students (85.4 percent). That offers some potential congruence with greater percentage of adult learners

in the online sample, as adult learners may have diminished opportunities to pursue education full time because they have other obligations such as work or family.

Differences in the two dependent variables for the study, namely GPA and persistence rate, were examined as well. The findings are summarized in Table 3.9:

Table 3.9: Dependent Variable Comparison of Online and Non-Online Students

Online Status	Cumulative GPA			Persistence
	Mean	SD	Skew	%
Online (N=138)	3.33	.52	-.74	78.3
Non-Online (N=534)	3.17	.52	-.36	77.0

The mean GPA of online learners is slightly higher than their non-online counterparts.

Online learners in this study are persisting at higher rates (78.3 percent) than non-online learners (77.0 percent). That is in contrast to some concern in the field regarding lower persistence rates among the online student population, and is examined further in the discussion of the results of the t-tests and Chi-Square tests. The ranges of GPA as represented by the GPASuccess variable are outlined for comparison in Table 3.10.

Table 3.10: GPA Ranges for Online and Non-Online Students

GPA Ranges (GPASuccess)		Percent	Cumulative Percent
Online	<= 2.660	11.6	11.6
	2.661 - 2.995	12.3	23.9
	2.996 - 3.330	18.1	42.0
	3.331 - 3.665	23.2	65.2
	3.666 - 4.000	34.8	100.0
	Total	100.0	
Non-Online	<= 2.660	19.3	19.3
	2.661 - 2.995	15.4	34.6
	2.996 - 3.330	22.8	57.5
	3.331 - 3.665	22.3	79.8
	3.666 - 4.000	20.2	100.0
	Total	100.0	

Comparing the cumulative percentages, non-online students had a greater percentage of GPAs at the lower end, with 23.9 percent of online students having a GPA of 2.995 or lower, and 34.6 percent of non-online students having a GPA in that range. Looking at the GPAs on the higher end of the spectrum, 34.8 percent of online students had a GPA higher than 3.665, while only 20.2 percent of the non-online students had a GPA higher than 3.665. While the higher GPAs among online learners could be associated with several factors, reasons associated with the difference were not a focus of the study.

Delimitations

Delimitations are the choices made by a researcher to establish the intentional boundaries of a study. Below are the delimitations for this study, with further discussion in Chapter V:

1. The focus was on the across-course experience. Students who were enrolled only in a single online course, were excluded from the study. The intent was to include only predominantly online students, and to analyze the across-course experience.
2. Transfer courses from outside of the five state institutions were not included in the sample. That step allowed for an examination of the student experience based upon enrollment within the state system, but did not attempt to account for previous experiences at institutions outside of the system.
3. Instructor pedagogy within and among online courses as experienced by the learners was not a topic of examination in this study, yet may be a significant influence upon student success and persistence, and is recommended for future research.

4. Analysis of the student-support structure from each institution in the sample was not included. Varying degrees of support for online students may have an impact on student success and persistence.

Summary

This chapter outlined the securing and construction of the data sample, along with decisions made by the researcher regarding the data. A description of the NSSE included the validity and reliability of the instrument in general, as well as results from the validity and reliability tests for use of the instrument with the samples in this study.

Characteristics of both the online and non-online learner samples were detailed.

Demographic variables were examined for potential intervening influences upon the two dependent outcome variables, and some differences in scores between demographic groups among the Engagement Indicator predictor variables were established. The next chapter describes the results of the analyses designed to answer the research questions, and the application of these results to the original research hypotheses.

CHAPTER IV: RESULTS

This chapter details the results from the analysis procedures employed in the study. The analyses were performed according to the following steps:

- First, independent t-tests were administered to explore potential differences between subpopulations in the sample and the dependent variable of GPA. The subpopulations were based on the demographic variables of gender, age, enrollment status, and Pell Grant eligibility (a representation of socioeconomic status).
- Chi-Square tests for independence were conducted each of the four demographic variables and the dependent variable of persistence beyond two semesters.
- To determine if there was any co-variation that could influence results among the demographic groups, each was correlated with the Engagement Indicator scores using Pearson Product-Moment correlation coefficient.
- Hierarchical multiple regression was employed to examine how the continuous GPA outcome variable was influenced by the NSSE Engagement Indicator predictor variables. That step of the analysis was divided into two separate regressions, each encompassing four of the ten Engagement Indicators, controlling for gender, age, enrollment status, and Pell Grant eligibility.
- A logistic regression was performed to explore the effect of Engagement Indicators scores upon the persistence (categorical) outcome variable.

The results of each step of analysis are summarized, and some initial discussion of the results is offered. The results are then applied to the original research questions and hypotheses.

Outcome Variables

Subgroups were analyzed to determine if there were any inherent differences in the dependent variables among the groups that would bias the analysis and introduce threats to validity. That is, the analyses sought to determine whether any of the major demographic variables might act as an intervening variable with the two outcome variables (GPA and persistence) for online learners. To determine if there were differences between groups in any of those demographics for the continuous GPA variable, independent samples t-tests were conducted to compare GPAs. Effect sizes were also calculated to determine the magnitude of the differences in GPA between groups. The first t-test was performed with gender and GPA, the results of which are summarized in Table 4.1.

Table 4.1: Independent-Samples T-Test for Gender and GPA

Gender	N	Mean	Std. Deviation	t	df	Sig. (2-tailed)	Mean Difference
Female	106	3.37	.50	-1.52	136	.132	-.16
Male	32	3.21	.57				

There was not a significant difference between males and females. Since the sample was predominantly female, the effect size was calculated to check for any potential contribution to variance. The effect size of gender was very small ($\eta^2 = .016$), indicating that 1.6 percent of the variance in GPA could be explained by gender.

A t-test was performed with age and GPA. Age was converted into a categorical variable, with “traditional age” being 25 or younger at the time of NSSE administration,

and “adult learner” being at older than 26 at the time of administration. The results of the t-test with age are summarized in Table 4.2

Table 4.2: Independent-Samples T-Test for Age and GPA

Age	N	Mean	Std. Deviation	t	df	Sig. (2-tailed)	Mean Difference
Adult	120	3.37	.48	-1.55	19.40	.137	-.27
Trad. Age	18	3.10	.71				

Much like with gender, the results for age and GPA fell short of statistical significance. The effect size of age was also very small ($\eta^2 = .016$), indicating 1.6 percent of the variance in GPA could be explained by age.

Enrollment status was the third demographic variable examined, with “full-time” status representing an average of at least three courses per semester, and “part-time” status being fewer than three. As indicated in Table 4.3, there was a significant difference in GPA between full-time and part-time students, with part-time students having a higher average GPA. The effect size of enrollment status was very small ($\eta^2 = .030$), indicating that 3.0 percent of the variance in GPA could be explained by enrollment status. That significant finding based upon enrollment status is addressed in the approach to building the regression models, and is discussed further in Chapter V.

Table 4.3: Independent-Samples T-Test for Enrollment Status and GPA

Enrollment Status	N	Mean	Std. Deviation	t	df	Sig. (2-tailed)	Mean Difference
Part time	60	3.44	.47	2.06	136	.042	.18
Full time	78	3.26	.55				

There was also a significant difference in GPA between those students eligible for Pell Grants and those not, with eligible students having a lower GPA. The effect size of Pell Grant eligibility was small ($\eta^2=.031$), indicating that 3.1 percent in the variance in GPA could be explained by Pell Grant eligibility. The results are summarized in Table 4.4.

Table 4.4: Independent-Samples T-Test for Pell Grant Eligibility and GPA

Pell Grant Eligible	N	Mean	Std. Deviation	t	df	Sig. (2-tailed)	Mean Difference
Yes	93	3.27	.53	2.09	136	.038	.19
No	45	3.47	.48				

Pell Grant eligibility may still be worth exploration in future research, as it did offer statistical significance when considering impact upon cumulative GPA. That will be discussed further in Chapter V. Overall, none of the demographic variables named above appeared to be a threat to validity in the analysis of GPA and engagement. However, combining each of those variables may explain a notable amount of the variance in GPA. That is discussed further in the results of the regression analyses.

Because there is some concern in the field regarding the academic success of online learners, one final t-test was performed to determine if there was a difference between the online and non-online samples secured for the purpose of this study. As noted in Table 3.9, the mean GPA was slightly higher for online learners (3.33) than for non-online learners (3.17). There was a significant difference in GPA between online students and non-online students. The effect size was small ($\eta^2=.018$), indicating that 1.8 percent in the variance in GPA could be explained by being an online student. That is a small yet statistically significant finding that there were GPA differences

between online learners and non-online learners, although it does not offer insight as to why the difference exists. That will be explored further through the regression analyses.

The results are summarized in Table 4.5.

Table 4.5: Independent-Samples T-Test for Online Status and GPA

Online Status	N	Mean	Std. Deviation	t	df	Sig. (2-tailed)	Mean Difference
Online	138	3.33	.52	-3.221	670	.001	-.16
Non-Online	534	3.17	.52				

To determine if there were differences between groups in any of the demographics for the categorical variable of persistence, a Chi-Square test for independence (with Yates Continuity Correction) was conducted for each of the following: gender, age, enrollment status, and Pell Grant eligibility. The results indicated no significant differences between groups within each of the demographic variables. That is, students were no more likely to persist beyond two semesters based upon gender, age, enrollment status, or Pell Grant eligibility. That indicated that the demographic variables would not likely be threats to validity in the analysis of persistence and engagement.

Based on concern in the field regarding persistence among online learners, possibly to an even greater extent than non-online learners, another Chi-Square test was conducted to determine if there were differences in persistence between the groups. While there were differences between the groups with GPA as determined by the earlier t-test, the Chi-Square test for independence indicated no significance association between online status and persistence, $\chi^2(1, n=672) = .044, p = .834, \phi = .012$. The results of the Chi-Square tests are summarized in Table 4.6.

Table 4.6: Chi-Square Results for the Demographic Variables

Demographic Variable	N	Continuity Correction	p
Gender	138	.570	.318
Age	138	.946	.331
Enrollment	138	3.442	.064
Pell Grant	138	1.431	.232
Online Status	672	.044	.834

Predictor Variables

The predictor variables in this study were the scores on each of the NSSE Engagement Indicators. To determine if there would be any co-variation of concern in the analyses, the relationships between each of the demographic variables listed above (gender, age, enrollment, and Pell Grant eligibility) and Engagement Indicator scores were investigated using Pearson Product-Moment Correlation coefficient. There was a small positive correlation between gender and one of the Engagement Indicators scores, namely Reflective and Integrative Learning, $r=.22$, $n=137$, $p=.010$. That indicates that there are significant differences in Reflective and Integrative Learning scores between males and females taking the majority of their coursework online. The correlations are listed in Table 4.7.

Table 4.7: Pearson's Product-Moment Correlations between Gender and EI Scores

	HO	RI	QR	LS	CL	DD	SF	ET	QI	SE
HO	-									
RI	.538**	-								
QR	.543**	.382**	-							
LS	.472**	.458**	.350**	-						
CL	.368**	.279**	.418**	.239**	-					
DD	.231*	.441**	.182*	.320**	.215*	-				
SF	.297**	.257**	.504**	.219*	.504**	.230**	-			
ET	.539**	.368**	.441**	.373**	.235**	.229**	.262**	-		
QI	.226*	.131	.100	.257*	.094	.085	.167	.416**	-	
SE	.460**	.353**	.184	.266**	.352**	.309**	.197*	.468**	.320**	-
G	.041	.218*	-.027	.093	-.043	.104	-.112	.148	.040	.022

Note. HO Higher-Order Learning, RI Reflective and Integrative Learning, QR Quantitative Reasoning, LS Learning Strategies, CL Collaborative Learning, DD Discussions with Diverse Others, SF Student-Faculty Interactions, ET Effective Teaching Practices, QI Quality of Interactions, SE Supportive Environment, G Gender

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

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

There was also a small positive correlation between age (adult versus traditional-age learner) and one of the Engagement Indicators scores, $r=.19$, $n=131$, $p=.033$, with adult learners being associated with greater Higher-Order Learning scores. The correlations for age and EI scores are listed in Table 4.8.

Table 4.8: Pearson's Product-Moment Correlations between Age and EI Scores

	HO	RI	QR	LS	CL	DD	SF	ET	QI	SE	AL
HO	-										
RI	.538**	-									
QR	.543**	.382**	-								
LS	.472**	.458**	.350**	-							
CL	.368**	.279**	.418**	.239**	-						
DD	.231*	.441**	.182*	.320**	.215*	-					
SF	.297**	.257**	.504**	.219*	.504**	.230**	-				
ET	.539**	.368**	.441**	.373**	.235**	.229**	.262**	-			
QI	.226*	.131	.100	.257*	.094	.085	.167	.416**	-		
SE	.460**	.353**	.184	.266**	.352**	.309**	.197*	.468**	.320**	-	
AL	.188*	-.024	.055	-.033	-.078	-.099	-.100	.108	.045	-.033	-

Note. HO Higher-Order Learning, RI Reflective and Integrative Learning, QR Quantitative Reasoning, LS Learning Strategies, CL Collaborative Learning, DD Discussions with Diverse Others, SF Student-Faculty Interactions, ET Effective Teaching Practices, QI Quality of Interactions, SE Supportive Environment, AL Adult Learner

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

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

For enrollment status (full-time versus part-time students), there were small positive correlations for four of the Engagement Indicators. As indicated in Table 4.9, full-time status was associated with higher scores on the following: Quantitative Reasoning, $r=.24$, $n=136$, $p=.006$; Collaborative Learning, $r=.30$, $n=132$, $p=.000$; Student-Faculty Interactions, $r=.33$, $n=136$, $p=.000$; and Effective Teaching Practices, $r=.25$, $n=137$, $p=.004$. With the large proportion of part-time students in the sample of online learners in the study, that finding is of particular interest. Chapter V offers further discussion of the finding, along with other facets of the online student population found in this study that may warrant further exploration in future research.

Table 4.9: Pearson's Product-Moment Correlations between Enrollment and EI Scores

	HO	RI	QR	LS	CL	DD	SF	ET	QI	SE
HO	-									
RI	.538**	-								
QR	.543**	.382**	-							
LS	.472**	.458**	.350**	-						
CL	.368**	.279**	.418**	.239**	-					
DD	.231*	.441**	.182*	.320**	.215*	-				
SF	.297**	.257**	.504**	.219*	.504**	.230**	-			
ET	.539**	.368**	.441**	.373**	.235**	.229**	.262**	-		
QI	.226*	.131	.100	.257*	.094	.085	.167	.416**	-	
SE	.460**	.353**	.184	.266**	.352**	.309**	.197*	.468**	.320**	-
FT	.145	.114	.235**	.015	.303**	.058	.326**	.245**	.058	.124

Note. HO Higher-Order Learning, RI Reflective and Integrative Learning, QR Quantitative Reasoning, LS Learning Strategies, CL Collaborative Learning, DD Discussions with Diverse Others, SF Student-Faculty Interactions, ET Effective Teaching Practices, QI Quality of Interactions, SE Supportive Environment, FT Full Time

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

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

There was a small negative correlation between Pell Grant eligibility and one of the Engagement Indicators, with Pell Grant eligibility being associated with lower scores on Quality of Interactions, $r=-.20$, $n=98$, $p=.046$. It is worth noting that Engagement

Indicator had the largest percentage of missing data. The finding is curious, as it may indicate that Pell Grant eligible students may have experienced lower amounts of Quality of Interactions with those at their institutions. Table 4:10 shows the results.

Table 4.10: Pearson's Product-Moment Correlations between Pell Grant and EI Scores

	HO	RI	QR	LS	CL	DD	SF	ET	QI	SE
HO	-									
RI	.538**	-								
QR	.543**	.382**	-							
LS	.472**	.458**	.350**	-						
CL	.368**	.279**	.418**	.239**	-					
DD	.231*	.441**	.182*	.320**	.215*	-				
SF	.297**	.257**	.504**	.219*	.504**	.230**	-			
ET	.539**	.368**	.441**	.373**	.235**	.229**	.262**	-		
QI	.226*	.131	.100	.257*	.094	.085	.167	.416**	-	
SE	.460**	.353**	.184	.266**	.352**	.309**	.197*	.468**	.320**	-
PG	.052	-.035	.071	.053	.159	-.055	.107	.076	-.202*	-.088

Note. HO Higher-Order Learning, RI Reflective and Integrative Learning, QR Quantitative Reasoning, LS Learning Strategies, CL Collaborative Learning, DD Discussions with Diverse Others, SF Student-Faculty Interactions, ET Effective Teaching Practices, QI Quality of Interactions, SE Supportive Environment, PG Pell Grant Eligible

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

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

With the foundation of the NSSE built upon brick-and-mortar experiences, it was worth exploring whether there was a correlation between online status itself and the Engagement Indicators. Those correlations are summarized in Table 4.11.

Table 4.11: Pearson's Product-Moment Correlations between Online Status and EI Scores

	HO	RI	QR	LS	CL	DD	SF	ET	QI	SE
HO	-									
RI	.592**	-								
QR	.399**	.331**	-							
LS	.446**	.441**	.310**	-						
CL	.276**	.277**	.287**	.246**	-					
DD	.285*	.353**	.200**	.261**	.394**	-				
SF	.324**	.242**	.364**	.242**	.487**	.277**	-			
ET	.418**	.316**	.255**	.323**	.084*	.175**	.214**	-		
QI	.325*	.248**	.170**	.282**	.095*	.180**	.229**	.479**	-	
SE	.399**	.324**	.207**	.294**	.286**	.309**	.262**	.471**	.352**	-
OL	.059	.057	.016	.068	-.305**	-.169**	-.181**	-.004	.083	-.102*

Note. HO Higher-Order Learning, RI Reflective and Integrative Learning, QR Quantitative Reasoning, LS Learning Strategies, CL Collaborative Learning, DD Discussions with Diverse Others, SF Student-Faculty Interactions, ET Effective Teaching Practices, QI Quality of Interactions, SE Supportive Environment, OL Online Learner

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

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

There were four negative correlations between online status and Engagement Indicator scores that reached statistical significance, with lower scores on the following scales: Collaborative Learning, $r=-.31$, $n=619$, $p=.000$; Discussions with Diverse Others, $r=-.17$, $n=531$, $p=.000$; Student-Faculty Interactions, $r=-.18$, $n=599$, $p=.000$; Supportive Environment, $r=-.10$, $n=481$, $p=.026$. The results offer some insight into the role of engagement measures for online learners as compared with non-online learners. While the results do not suggest that the negative correlation is associated with negative outcomes in terms of GPA and persistence among online learners, they do suggest that the “engagement” picture may look different. That is discussed further in Chapter V.

As more research is performed on the concept of engagement and online learning, the differences between groups may warrant further study. For the purposes of this study, the groups were examined for any large differences that might have influenced the two dependent variables in the original research questions. The differences in EI scores

among the four demographic groups were small to medium, with r values ranging from .17 to .33. Based upon the strength of the correlations above, it is possible that bias would be introduced into the analyses of Engagement Indicator scores and the dependent variables for this study. It was important, then, to make efforts to control for those variables in the regression model.

With other diagnostics completed, the focus turned to the two original research questions regarding the association between the independent variable of student engagement and the dependent variables of GPA and persistence. The first to be explored was the relationship between engagement and GPA. According to Tabachnick and Fidell (2001), attention to the number of variables in a regression analysis is important, the general rule being to seek the best solution with the fewest number of variables. Including too many variables relative to sample size can result in “overfitting”, a condition defined as “a wonderful fit to the sample that may not generalize to the population” (Tabachnick & Fidell, 2001, p. 11). That caution is reinforced by Hair, Black, Babin, Anderson, and Tatham (2006), who noted how “the addition of more independent variables is based on trade-offs between increased predictive power versus overly complex and even potentially misleading regression models” (p. 187). With ten Engagement Indicators and four demographic categories serving as the independent variables in this study, an intentional approach was needed to determine which variables to enter into the regression model.

One approach suggested by Tabachnick and Fidell (2001) is to use the following rule of thumb for testing multiple correlation: $N \geq 50 + 8(m)$ (where m is the number of independent variables). In this study, if all ten of the Engagement Indicators were to be

entered into a regression model, the equation would be $50+(8)(10)=130$ to test regression. For stepwise regression, however, more cases may be needed. One guideline is a cases-to-IV ratio of 40 to 1 because “statistical regression can produce a solution that does not generalize beyond the sample unless the sample is large” (Tabachnick & Fidell, 2001, p. 117). Similarly, a guideline of 50 to 1 for a stepwise procedure was recommended by Hair et al. (2006). With a sample of 138 online learners in this study, minimizing the number of independent variables in an intentional manner was an important consideration.

Hair et al. (2006) suggested that the strength of correlations between the independent and dependent variables can assist the decision making process about which variables to select. Using that approach, a Pearson’s Product Moment correlation was performed between GPA and the ten Engagement Indicator scores. Only one of the ten Engagement Indicator scores, Reflective and Integrative Learning, reached statistical significance with GPA. The results are represented in Table 4.12.

Table 4.12: Pearson's Product-Moment Correlations between GPA and Engagement Indicators Scores

	HO	RI	QR	LS	CL	DD	SF	ET	QI	SE
HO	-									
RI	.538**	-								
QR	.543**	.382**	-							
LS	.472**	.458**	.350**	-						
CL	.368**	.279**	.418**	.239**	-					
DD	.231*	.441**	.182*	.320**	.215*	-				
SF	.297**	.257**	.504**	.219*	.504**	.230**	-			
ET	.539**	.368**	.441**	.373**	.235**	.229**	.262**	-		
QI	.226*	.131	.100	.257*	.094	.085	.167	.416**	-	
SE	.460**	.353**	.184	.266**	.352**	.309**	.197*	.468**	.320**	-
G	.091	.170*	.067	.096	-.101	-.074	-.075	.044	.142	.028

Note. HO Higher-Order Learning, RI Reflective and Integrative Learning, QR Quantitative Reasoning, LS Learning Strategies, CL Collaborative Learning, DD Discussions with Diverse Others, SF Student-Faculty Interactions, ET Effective Teaching Practices, QI Quality of Interactions, SE Supportive Environment, G GPA

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

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

The decision was made to include any Engagement Indicator with a correlation of .06 or above. Of the eight meeting that criteria, there appeared to be two natural groupings of Engagement Indicators. The first involves the social aspects of learning including Collaborative Learning, Discussions with Diverse Others, Student-Faculty Interactions, and Quality of Interactions. As discussed in Chapter II, research has indicated that both academic and social engagement are important for the success of online learners (Chen et al., 2008, Jagers 2011, Slagter van Tryon & Bishop, 2012). The second group comprised Engagement Indicators associated with the approach to learning: Higher-Order Learning, Reflective and Integrative Learning, Quantitative Reasoning, and Learning Strategies.

As a result of the independent samples t-tests, there were indications that some demographic variables may influence the results with GPA. While only two of the demographic variables reached statistical significance with GPA (enrollment status and

Pell Grant eligibility), the decision was made to consider all four, since combined they accounted for approximately 10 percent of the variance in GPA. To control for demographic variables, a hierarchical regression was performed separately for each of the two groups of Engagement Indicators. The first hierarchical multiple regression was used to assess the ability of the social Engagement Indicators (Collaborative Learning, Discussions with Diverse Others, Student-Faculty Interactions, and Quality of Interactions), after controlling for the influence of gender, age, enrollment status, and Pell Grant eligibility. Gender, age, enrollment status, and Pell Grant eligibility were entered at Step 1, explaining 8.4 percent of the variance in GPA. After entry of the Engagement Indicators at Step 2 the total variance explained by the model as a whole was $R^2 = 10.4\%$, $F(8, 85) = 1.23$, $p > .05$. The Engagement Indicators explained an additional 2.0 percent of the variance in GPA, after controlling for the four demographic variables, R^2 change = .020, F change (4, 85) = .483, $p > .05$. In the final model, none of the Engagement Indicators were statistically significant. The findings are summarized in Table 4.13.

Table 4.13: Hierarchical Regression Model with the Social Indicators

	<i>R</i>	<i>R</i> ²	<i>R</i> ² <i>Change</i>	<i>B</i>	<i>SE</i>	β	<i>t</i>
Step 1	.289	.084					
G				.155	.125	.126	1.241
AL				.226	.158	.147	1.428
FT				-.105	.112	-.101	-.935
PG				-.151	.117	-.137	-1.289
Step 2	.322	.104	.020				
G				.158	.128	.129	1.231
AL				.205	.161	.134	1.273
FT				-.111	.121	-.107	-.922
PG				-.124	.123	-.112	-1.005
CL				-.001	.005	-.036	-.298
DD				-.003	.004	-.080	-.743
SF				.001	.004	.016	.125
QI				.005	.005	.122	1.132

Note. CL Collaborative Learning, DD Discussions with Diverse Others, SF Student=Faculty Interactions, QI Quality of Interactions, G Gender, AL Adult Learner, FT Full Time, PG Pell Grant Eligibility

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

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

A second hierarchical regression was performed to assess the ability of the other Engagement Indicators (Higher-Order Learning, Reflective and Integrative Learning, Quantitative Reasoning, and Learning Strategies) after controlling for the influence of gender, age, enrollment status, and Pell Grant eligibility. Those four demographic variables were entered at Step 1, explaining 8.4 percent of the variance in GPA. After entry of the Engagement Indicators at Step 2, the total variance explained by the model as a whole was 11.2 percent, $F(8, 113) = 1.77, p > .05$. The Engagement Indicators explained an additional 2.8 percent of the variance in GPA, after controlling for the four demographic variables, R squared change = .028, F change (4, 113) = .889, $p > .05$. In the final model, none of the Engagement Indicators were statistically significant. The findings are summarized in Table 4.14.

Table 4.14: Hierarchical Regression Model with the Learning-Centered Indicators

	<i>R</i>	<i>R</i> ²	<i>R</i> ² <i>Change</i>	<i>B</i>	<i>SE</i>	β	<i>t</i>
Step 1	.289	.084					
G				.155	.109	.126	1.423
AL				.226	.138	.147	1.638
FT				-.105	.098	-.101	-1.072
PG				-.151	.102	-.137	-1.478
Step 2	.334	.112	.028				
G				.112	.113	.091	.993
AL				.234	.144	.153	1.625
FT				-.135	.102	-.130	-1.325
PG				-.138	.103	-.125	-1.338
HO				-.002	.005	-.042	-.335
RI				.006	.005	.151	1.314
QR				.002	.003	.054	.490
LS				.001	.004	.033	.311

Note. HO Higher-Order Learning, RI Reflective and Integrative Learning, QR Quantitative Reasoning, LS Learning Strategies, G Gender, AL Adult Learner, FT Full Time, PG Pell Grant Eligibility

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

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

The results indicate that the overall construct of student engagement may not have a significant impact upon the GPA of online learners. If the behaviors and conditions represented by the items in those widely embraced measures of engagement do not offer positive influence upon GPA, it would have implications for how campus administrators gather and interpret data regarding effective policies and practices. The assumption that the lens of engagement would have similar theoretical and practical value for online learners as it has for face-to-face learners does not appear to be correct. While the study focuses on the notion of engagement, it may offer evidence that the online experience may be quite distinct from the non-online experience. It also may offer some important reminders, and perhaps some caution, for the discussion about student engagement and the use of results on an instrument such as the NSSE. The NSSE offers campuses a descriptive measure of engagement for comparisons to the national sample, to other

institutions, and to the same institution over time. It does not offer inferential statistics, yet campuses may infer from the descriptive statistics of NSSE results that campus practices and student behaviors are yielding broader outcomes such as higher academic achievement (GPA) and progress towards degree completion (persistence). The lack of association between student engagement and GPA in this study does not discount the importance of engagement, but does indicate that making an assumption that engagement will directly contribute to greater academic performance may not be supported.

To address the second research question, logistic regression was performed to assess the impact of the Engagement Indicator scores on the likelihood that online students would persist beyond two semesters. The following is a step-by-step procedural analysis for the interpretation of the regression model. With no significance from the Chi-Square tests, the researcher did not incorporate the demographic variables (gender, age, enrollment status, and Pell Grant eligibility) into to regression. To determine the Engagement Indicators that would be entered into the logistic regression, a Pearson's Product-Moment correlation was performed between GPA and the ten Engagement Indicator scores. Using the earlier approach of selecting Engagement Indicators having significance of at least .06, five reached that threshold: Higher-Order Learning, Collaborative Learning, Discussions with Diverse Others, Effective Teaching Practices, and Quality of Interactions. All five were entered into the logistic regression model. The results are shown in Table 4.15.

Table 4.15: Pearson's Product between Persistence and Engagement Indicator Scores

	HO	RI	QR	LS	CL	DD	SF	ET	QI	SE
HO	-									
RI	.538**	-								
QR	.543**	.382**	-							
LS	.472**	.458**	.350**	-						
CL	.368**	.279**	.418**	.239**	-					
DD	.231*	.441**	.182*	.320**	.215*	-				
SF	.297**	.257**	.504**	.219*	.504**	.230**	-			
ET	.539**	.368**	.441**	.373**	.235**	.229**	.262**	-		
QI	.226*	.131	.100	.257*	.094	.085	.167	.416**	-	
SE	.460**	.353**	.184	.266**	.352**	.309**	.197*	.468**	.320**	-
P	.071	.054	-.059	.008	.108	-.062	.027	.065	.089	-.033

Note. HO Higher-Order Learning, RI Reflective and Integrative Learning, QR Quantitative Reasoning, LS Learning Strategies, CL Collaborative Learning, DD Discussions with Diverse Others, SF Student-Faculty Interactions, ET Effective Teaching Practices, QI Quality of Interactions, SE Supportive Environment, P Persistence

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

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

The results of the regression were mixed. For the Omnibus Tests of Model Coefficients, which is an overall indication of how the model performs, the significance value was .714, a sign that the model with the set of predictor variables was no better than the original estimate in Block 0 assuming that all students would persist. That was contradicted by the Homer and Lemeshow Test, considered to be the most reliable test of model fit available in IBM SPSS (Pallant, 2013). Poor fit in this case would be demonstrated by a significance value of less than .05, but the results yielded $p=.411$. The Classification Table shows how well a model is able to predict the correct category (Pallant, 2013): in this case whether or not an online student would persist. According to that measure, the model correctly classified 81.3 percent of the students who persisted, demonstrating no improvement over the 81.3 percent from Block 0. To further investigate the effects of the predictor variables, the beta weights and significance values were examined. None of the variables in the equation reached statistical significance.

Considering that evidence with the other indicators, it appears that the full model containing those five Engagement Indicators was not statistically significant. That would indicate that Higher-Order Learning, Collaborative Learning, Discussions with Diverse Others, Effective Teaching Practices, and Quality of Interactions did not provide predictive value as to whether online learners would persist. The results from the logistic regression are summarized in Table 4.16.

Table 4.16: Logistic Regression Predicting Persistence with the Five Indicators

	B	S.E.	Wald	df	p	Odds Ratio	95% C.I for Odds Ratio	
							Lower	Upper
HO	.008	.023	.120	1	.729	1.008	.963	1.055
CL	.013	.021	.352	1	.553	1.013	.972	1.055
DD	-.017	.019	.776	1	.381	.983	.946	1.021
ET	.010	.021	.216	1	.642	1.010	.969	1.053
QI	.022	.025	.786	1	.375	1.022	.974	1.073
Constant	-.015	1.261	.000	1	.990	.985		

Note. HO Higher-Order Learning, CL Collaborative Learning, DD Discussions with Diverse Others, ET Effective Teaching Practices, QI Quality of Interactions

The results demonstrate how student persistence can be a very complex construct, one that may be influenced by different factors, and that may vary between student groups. That also reinforces the earlier discussion regarding long-standing reliance on engagement as a predictor for student success, and the importance of analysis on the campus level to go beyond the descriptive nature of NSSE scores.

Summary of Results: Research Hypotheses

The purpose of this study was to examine whether the construct of student engagement as encapsulated by the NSSE Engagement Indicators, would apply to online learners in a manner similar to how it has widely applied to non-online learners since the inception of the NSSE. The research questions for this study were:

1. What is the relationship between student engagement and persistence in online undergraduate coursework?
2. What is the relationship between student engagement and success in online undergraduate coursework?

The null hypothesis was the test of significance for this study. Applying the null hypothesis to the research questions, the following were the null hypotheses statements:

1. There will be no significant relationship between student engagement and persistence (as measured by enrollment beyond two semesters) among undergraduates enrolled in primarily online coursework.
2. There will be no significant relationship between student engagement and success (as measured by GPA) among undergraduates enrolled in primarily online coursework.

According to the results of the logistic regressions, the null hypothesis could not be rejected for Hypothesis Statement 1. Indeed, there was no significant relationship between student engagement and persistence among the online learners in this study.

None of the Engagement Indicators offered any statistically significant association with persistence.

For Hypothesis Statement 2, the null hypothesis was not rejected, as there was no statistically significant relationship between the level of student engagement and cumulative GPA. While the initial analysis indicated that Reflective and Integrative Learning may be positively correlated with higher GPAs among online learners, the significance was “washed out” by controlling for gender, age, enrollments status, and Pell Grant eligibility. The diagnostics employed to analyze the data included independent t-

tests, Chi-Square tests for independence, Pearson Product-Moment correlation coefficients, hierarchical regressions, and logistic regressions. The next chapter summarizes the key findings, offering interpretation of the findings along with potential implications for practice, policy, and future research. Study limitations will also be discussed.

CHAPTER V: CONCLUSIONS

Key findings from the study are summarized, with interpretation offered for each despite low predictive validity. Theoretical implications for the ongoing application of the engagement construct to online learners are discussed, as well as methodological implications for the administration of the NSSE. Those implications are applied to both the practice and policy realms. Limitations of the study are outlined, along with recommendations for future research.

Contextual Framework of the Study

Precedent had been established for using NSSE results for the purpose of exploring measures of success and persistence among face-to-face learners (Carini et al., 2006; Kuh et al., 2008; Pike, 2013; Webber et al., 2013). While some research supports the application of the NSSE engagement measures to the online experience (Robinson & Hullinger, 2008), there is relatively little evidence in the literature to that end. A contributing factor has been the lack of a consistent definition of “online” in terms of learners, courses, and programs. That has created a challenge for accurately determining how many students are taking online courses nationally, differentiating between different learning experiences that have been aggregated under the “online” umbrella, and measuring the efficacy of online learning experiences. The need for a clear, consistent definition of “online” has been widely discussed (Jaggers & Bailey, 2010; Fishman, 2013; Allen & Seaman, 2015), with online experiences being expanded across the educational spectrum.

Key Findings and Interpretations

According to the analysis of GPA, and results of regressions with GPA and the Engagement Indicators, there was no statistically significant relationship between the level of student engagement and cumulative GPA among online learners, with low correlations from the start. Previous research had examined the application of NSSE results to the outcome of GPA. The research from the Connecting the Dots project cited earlier applied logistic regression with a much larger sample (approximately 11,000 students), finding standard deviation increases of .04 GPA points for first-year students and .03 for seniors with each increase in standard deviation in engagement (NSSE). That raises the question of statistical significance versus practical significance. While any positive contribution to student achievement may be welcomed, it is important not to overstate the role of engagement if the impact is slight, and if the association varies among different types of learners. In the research offered by NSSE, online learners were neither identified nor separated from the sample of 11,000 students. To the credit of the NSSE researchers, ongoing evaluation of the instrument and its applications is part of the organization's practice. For example, Chen et al. (2008) asserted that, "The NSSE project will continue to explore [online learning], perhaps by testing new questions that specifically target the types of learning activities that appear to be best situated in the online environment" (p. 5). Considering the rapid expansion of online learning, such exploration is both timely and critical, and this study underscores the need for careful redesign.

The low correlations between the more-social Engagement Indicators and the dependent variables in this study is incongruent with the assertion that the social aspect of learning is of high importance. Previous research indicated that interpersonal interaction with peers and faculty is a powerful influence on student learning and persistence (Spann, 1990; Terenzini, Pascarella, & Blimling, 1999; McClenney, 2006; Slagter van Tryon & Bishop, 2012). The *Seven Principles for Good Practice in Undergraduate Education* (Chickering & Gamson, 1987) stressed the encouragement of contact between students and faculty, and the development of reciprocity and cooperation among students. Perhaps the concept of psychological sense of community (DeNeui, 2003), which has been studied for its connection with GPA and degree completion (Brown & Burdsal, 2012), may not be as critical for online learners. While the need for attending to both academic and social engagement has been explored (Hu, 2011), those measures as embodied by the constructs of the NSSE Engagement Indicators did not offer predictive value for student success and persistence in this study.

The results of the logistic regression with persistence and the Engagement Indicators did not allow for the rejection of the null hypothesis, as there was no statistically significant relationship between levels of engagement and persistence among online learners. The study brings into question the value of the engagement construct as measured by NSSE as a factor in the persistence of online learners. This study did explore whether some demographic variables may influence persistence among online learners, but no significant differences in persistence was found between groups based upon gender, age, enrollment status, or Pell Grant eligibility.

It is worth noting again that a larger percentage of online students were Pell Grant eligible (67.4 percent) than were non-online students (62.5 percent). The relatively high proportion among both could be attributed to the sample deriving from public institutions, with potentially lower tuition rates being a draw for students of lower socioeconomic means. However, it also could serve as an indication of how students in a lower socioeconomic status may be drawn in higher proportions to online learning environments, consistent with previous studies (Johnson & Mejia, 2014). Among online learners, there was a significant difference ($p < .05$) in GPA based upon Pell Grant eligibility, with lower GPAs found in the Pell Grant eligible group ($M = 3.27$) as compared with the non-eligible group ($M = 3.47$). While the results offered no significant difference in persistence in online learners based upon Pell Grant eligibility, lower GPAs remains an area of concern for the potential of a larger achievement divide based upon socioeconomic status (Bowen, 2013; Xu & Jaggars, 2014).

Another curious finding from the study was the similarity between traditional-age students and adult learners in the online sample. In this study, there were no significant differences between traditional-age and adult online learners in terms of GPA and persistence. Previous studies had found differences between those groups in areas such as NSSE scores and the level of social interaction in online courses (Robinson & Hullinger, 2008; Lerer & Talley, 2010). Researchers have suggested that adult learners may have different motivations than traditional-age undergraduate students (Bean & Metzner, 1985; Price & Baker, 2012). The only significant difference in Engagement Indicator scores was on the Higher-Order Learning scale, but the association was slight. A possible interpretation of those results is that age differences may not hold as much

weight for online learners as they do for brick-and-mortar experiences. That interpretation must be tempered by the small number (n=18) of the traditional-age learners in the online sample. The high proportion of adult learners may be associated with the institutions included in this study, as two of the traditionally residential campuses in the state system did not participate.

The differences in Engagement Indicator scores between part-time and full-time students were also notable, with 56.5 percent of online students being full time, compared to 85.4 percent of the non-online students being full time. Among the online learners, the full-time students had higher scores on the following Engagement Indicator scales: Quantitative Reasoning, Collaborative Learning, Student-Faculty Interactions, and Effective Teaching Practices. That is in contrast with a slightly lower GPA for full-time students as compared to part time. While there were higher scores, the regression analyses did not find any statistical significance between any of the Engagement Indicators and the two dependent variables in this study. That again brings into question the connection between traditional engagement measures when considering outcomes such as GPA and persistence for different types of learners, in this case part-time and full-time students who are primarily online.

The research questions in this study focused on online learners, and the results indicate that online learners may be different than non-online learners according to a variety of measures. As compared with non-online learners, the online learners were older, more predominantly female, enrolled on a more part-time basis, and eligible for Pell Grants at greater numbers. There were also some differences in Engagement Indicator scores based on online status. The Engagement Indicators have long been

considered as positive predictors of student success and persistence among non-online learners, with higher scores being considered a desirable reflection upon institutions' policies and practices. In this study, there were four statistically significant negative correlations between online status and Engagement Indicator scores: Collaborative Learning, Discussions with Diverse Others, Student-Faculty Interactions, and Supportive Environment. Online learners had lower scores on each of those scales. Three of the four are associated with the social aspect of learning, namely Collaborative Learning, Discussions with Diverse Others, and Student-Faculty Interactions. As mentioned earlier, that may illustrate how the role of social learning may be different for online learners than for non-online learners.

There were slightly higher GPAs and slightly higher persistence rates among the online learners. The persistence rate of online learners in this study was 78.3 percent, as compared with 77.0 percent of non-online learners, a difference that did not reach a level of statistical significance. Online learners had a higher cumulative GPA ($M=3.33$) than non-online learners ($M=3.17$). There could be one or many factors associated with those rates of GPA and persistence among students in the online sample. Some of that may be attributed to decisions made in the study, such as the cutoff of a 2.0 GPA for inclusion, or the threshold of enrollment beyond two semesters as the definition of persistence. It may also be attributed to the demographics of those in the online sample. While it is unclear why the rates are different, the results do contradict the perception that online learners may be less successful than non-online learners. Differences between groups in outcomes such as GPA and persistence may be attributed to more than just one characteristics, such as whether a student is online or not online. It is the responsibility of each institution to

“unpack” the differences to be able to design policies and practices that are effective in supporting student success.

The research questions in this study focused on only two dependent variables, GPA and persistence, which make a partial contribution to the understanding of the complex phenomenon of student success. For example, GPA is one indicator of performance and success, yet students with lower GPAs may persist, and those with higher GPAs may not persist. Student success and student persistence are influenced by a multitude of factors, and this study examined one: student engagement, as measured by the NSSE Engagement Indicators. There may have been other questions in the NSSE outside of the Engagement Indicators that could have provided alternative contributions to GPA and persistence among online learners, but they were not within the scope of the study.

The results of this study also illustrate how it is critical to go beyond descriptive results before making any inferences. As described earlier, there were higher Engagement Indicator scores on some of the scales for full-time online students. If a campus received such results from NSSE and concluded that full-time online students were more successful, this study suggests that conclusion might be erroneous, since part-time online students had higher GPAs than full-time online students. An institution may be tempted to place a great deal of stock upon NSSE results, since the NSSE has been a mainstay in the discussion about creating campus conditions for students to make progress towards degree completion. In such cases, campus administrators may perceive high NSSE scores as the desired outcome, instead of questioning how the scores are associated with the actual outcomes of student success and persistence. Of particular relevance to this study

is how administrators may also continue to interpret NSSE scores for online learners in the same way that scores are interpreted for non-online learners; the leap to those conclusions may not be warranted, and may even be counterproductive. Even making such a leap would be predicated on an institution's ability to define what it means to be an "online" student and consistently identify those students.

Revisiting the Study Limitations

It is important to revisit the limitations of the study when considering the potential generalizability of its findings. First, the convenience sample, comprising those who had responded to the NSSE across five institutions in the state system, was not representative of the entire spectrum of learners in postsecondary institutions across the country. The state system selected for this study attracts high percentages of students who are Caucasian, lower-income, first-generation college students. A similar study replicated in a different state or region may yield different results. A second limitation associated with the state system is that the geographic location of the online learners was not factored into the analysis, with location potentially influencing opportunities for certain types of engagement. A third limitation related to the institutions involved in the study is the array of academic programs offering online courses as part of the undergraduate degree program. Not every academic discipline provided online options, and academic discipline was not factored into the study.

A fourth limitation harkens back to the discussion regarding how "online" is defined nationally. Each course experience in the state system's information management system is coded in a variety of ways, based on characteristics such as location and method of instruction. For the purpose of this study, there were four designations used

across five institutions, indicating that a course would be considered to be “online.” However, there was no way to determine the consistency of the characteristics among those courses. For example, the faculty member teaching a course may designate the course location as online, but require some in-person interaction with and among students. Thus that course could be considered a blended course, but labeled as online. Without clear criteria regarding how a course is defined, it is likely that the heterogeneity of the courses categorized as “online” across the state system may confound the results.

Another limitation associated with the “online” definition is the threshold used for labeling a student as an online learner for the purposes of this study. One of the campuses in the state system was using an established definition of 50 percent of coursework being taken online to consider a student as an online learner. That was the threshold selected for this study as well. It is important to consider the possibility that students included in the online sample may not have taken all coursework online, and the face-to-face campus experiences could have influenced their NSSE responses.

While one of the study’s delimitations was an intentional examination of the across-course experience (rather than looking at single-course experiences), it was not designed as a longitudinal study, creating another study limitation. It is unknown, for example, whether students in the online sample continued taking the majority of their coursework online, or if the ratio shifted after the time period of the study. With the study examining only the time period from fall 2011 through spring 2012, it is possible that there were other shifts in GPA and persistence among online learners in subsequent semesters. Also, while this study did capture some of the across-campus mobility among students in the state system., it did not follow students who may not have reenrolled in

any of the five institutions but did enroll in another institution of higher education for continued progress towards degree completion.

Lastly, a limitation may result from the potential attrition bias in this study. One aspect of the attrition bias could be associated with the administration cycle of the NSSE: with the invitation for survey completion being sent to students in the spring semester, those students most at risk may have already left school, leading to an artificially inflated level of persistence among those who complete the NSSE. That is similar to when course performance at the end of the semester serves as the variable of interest, which, if unaccounted for, can threaten the validity of a study (Wu, 2015). This study did not account for withdrawal rates from online courses.

Implications for Policy and Practice

Institutions of higher education have been prioritizing initiatives to address low rates of college completion (Hu, 2011; Hu & McCormick, 2012; Shapiro, D., Dundar, A., Ziskin, M., Yuan, X., & Harrell, A., 2013), both in policies and practices. Some research indicates an additional level of challenge in retaining online students (Clay, Rowland, & Packard, 2009; Jagers & Bailey, 2010; Johnson & Mejia, 2014), although the notion of retention rates of online learners compared with face-to-face learners continues to be debated in the field. Even the perception of a difference in persistence rates has raised concerns among college administrators regarding the success of online learners (Allen & Seaman, 2015). However, the results of this study indicate that relying on policies and practices founded upon the construct of student engagement as embodied by the NSSE Engagement Indicators may not be warranted for online learners when considering student persistence. If the construct of student engagement does not “hold water” for

online learners as an important aspect of the persistence equation, identifying other contributors to student persistence becomes a high priority. Without making such a shift, resources of institutions, systems, states, and national organizations within the field of higher education may continue to attribute persistence of online students to high levels of engagement, and thus continue to craft policies and allocate resources to that end.

Some other potential contributing factors to persistence among online learners have been suggested in the literature. For example, there is a widely held perception that students require a higher level of discipline to succeed in an online course than in a face-to-face course (Allen & Seaman, 2015). Another focus has been level of student preparedness, with some research indicating how underprepared students are more likely to withdraw from online courses (Jaggers & Bailey, 2010; Johnson & Mejia, 2014; Xu & Jaggers, 2014). It may be tempting, though, for the pendulum to swing back towards having a student hold more responsibility for success in college, rather than share that responsibility with his or her institution. Mutuality is a key aspect of the student-engagement construct (Kuh, 2009). This study does not suggest that the NSSE is not relevant for applying the notion of student engagement to persistence among online learners, rather that the Engagement Indicator scales may not be as applicable. Exploring whether there are aspects of student engagement other than those represented by the NSSE Engagement Indicators may offer valuable avenues for supporting the persistence of online learners. The importance of engagement, as well as the nature of the engagement construct, may be different for online learners than for non-online learners.

There are frameworks that campuses are encouraged to use to offer quality, effective online experiences for students. Examples of standards include U.S. Regional

Accrediting Standards, the Sloan-C Quality Scorecard, the Quality Matters framework, and the iNACOL National Standards for Online Teaching (WCET, 2013). It is a campus decision as to whether to use any rubric for achieving and maintaining high-quality online experiences, and another as to whether such a rubric would be a requirement for the development and delivery of an online learning experience. According to a study conducted by the WICHE Cooperative for Educational Technologies, approximately 85 percent of responding institutions had implemented some form of standards or best practices, but those varied from campus to campus (WCET, 2013).

The attrition bias in this study offers another implication for policy and practice. That bias may be replicated in the NSSE results for any campus using the spring-semester cycle of administration. The timing of the administration results in dropouts from the fall semester and dropouts early in the spring semester to be absent from the engagement picture. Attrition bias may also be compounded by the lack of inclusion of students who have dropped out of courses among studies regarding online learning (Wolff et al., 2014; Wu, 2015). One potential approach for addressing the attrition bias would be to measure engagement earlier in the academic cycle. The NSSE organization offers the Beginning College Survey of Student Engagement, although it focuses upon high-school experiences and perceptions regarding the start of the first year of college (NSSE). The Center for Community College Student Engagement developed the Survey of Entering Student Engagement (SENSE), administered during weeks four and five of the fall academic term (CCCSE, 2013). The nature and timing of such instruments may include more of the students who are most at risk of dropout, yet also may remain descriptive in

terms of the data gathered. As discussed earlier, it would be important for campuses to engage in further analysis instead of making too many inferences from descriptive data.

Another approach for gathering data earlier in the academic cycle would be through the implementation of campus early-alert systems. The data can inform and enable campuses to more effectively apply retention practices to reduce dropout rates (Lotkowski et al., 2004). Such an approach may also result in a connection being made between engagement and persistence that has not been found in the research because of the bias. Consistent expectations of faculty to use early-warning systems would be critical to the success of the approach, and campus policies would need to reflect that expectation. Data from early-alert systems may also uncover factors associated with persistence other than student engagement. With online learners, harnessing the analytics capabilities of learning-management systems used in online courses would be an important consideration. That too has implications for how institutions allocate resources, as a requisite for the success of using such analytics would be to have campus-level expertise in that arena.

The manner in which NSSE results are gathered, aggregated, and interpreted on the campus and national level is another implication for practice. Campuses receive data reports, as well as student-level data, from NSSE after the administration of the instrument. As colleges and universities continue to expand online options, separating the NSSE results of online learners from non-online learners may be an important step. Aggregating the student responses regardless of online and non-online status may skew the picture of engagement for an institution, and muddy the comparative picture between institutions. On a similar note, the national NSSE results do not distinguish between

online and non-online learners when there may indeed be differences between those groups in terms of the nature and value of the engagement construct. A prerequisite for that separation would be clear and consistent definition of “online”, both at the campus level and nationally. The need for such a definition has been emphasized in the literature (Fishman, 2013; Allen & Seaman, 2015) to understand more about online learning, including the efficacy of online learning, and students selecting online coursework as part or all of their undergraduate degree paths.

A final implication is whether administrators at NSSE campuses consider the results as one data point of many. NSSE results can contribute to a process for understanding when followed up by a deeper set of analytic approaches. The process could include quantitative analyses such as those employed in this study, along with qualitative interviews to better understand the student experience. A more comprehensive picture would emerge by also employing data analytics with information such as enrollment demographics, student interface with the campus’ learning-management system, and academic-alert submissions. Together with NSSE results, those data would allow administrators to identify patterns among the student body, along with patterns of individual student behaviors. It also would allow for differentiation among subpopulations of students to inform policies and practices to better support each group.

Recommendations for Future Research

This study identified several priorities for future research into the study of student engagement among online learners. The most overarching recommendation is for a common definition of “online” to be devised and embraced within the field of higher education. It could include the delineation of online experiences into categories of

learners and categories of coursework. Examples include fully online, blended, low residency, and other descriptors that could add value and clarity as long as there was consistency. Established definitions would offer researchers the parameters for inclusion of specific learners, courses, and programs when exploring online learning.

A second recommendation is to replicate this study with a larger, more diverse sample of online learners to further investigate the role of student engagement with online learners. This study found some differences among the Engagement Indicators scores between groups based upon gender, age, and enrollment status of online learners. Those offer direction for how to delineate group characteristics within a broader online learner sample. A larger study could include campuses from multiple regions of the country, and a wider continuum of the types of institutions through which online coursework is being offered. Such a study could also distinguish between fully online learners and those in other categories of online experiences in terms of the role of student engagement. There is some evidence that, while GPA may be lower among some online learners, degree-completion rates may be higher with particular groups of online learners (Johnson & Mejia, 2014). Larger studies that research both GPA and persistence of online learners could add to the small body of evidence currently available. Such studies would also allow further investigation as to whether age is a significant factor for online learners.

A third recommendation for future research is to investigate aspects of the NSSE other than the Engagement Indicators that may hold significance for the success and persistence of online learners. The NSSE has long been considered an effective proxy for the concept of engagement (Kuh, 2009), and has become an entrenched part of the

national and local discussions regarding success and persistence of college students. Identifying components within the existing instrument that could add to efforts aimed at supporting online learners would likely be a more palatable shift in practice than seeking to create an entirely different measure. The result could be the option for campuses to delve back into existing data sets to apply the revised engagement lens to their online student populations. The robust data sets already available from years of NSSE administrations would serve as the foundation for more longitudinal research regarding the role of student engagement in the success and persistence of online learners. A closely related fourth area of future research is whether particular NSSE questions may be more relevant for certain subgroups of students, such as adult learners or part-time students, and whether new questions may need to be crafted to reflect the experience of different subgroups. A final area of future research to consider is whether factors not associated with the construct of student engagement may explain more of the variance in GPA and persistence rates among online learners.

Conclusion

Efforts to support degree completion have been underway for decades in the field of higher education, and have taken on a renewed sense of urgency. The construct of student engagement has been a mainstay in that discussion, and has long been considered a crucial component to the success and persistence of undergraduates. The ongoing expansion of online learning opportunities has been driven by increasing access to a college education, offering new pathways to degree completion, and lowering the cost of higher education. The growth in online education has not been accompanied by a proportional growth in the research concerning online learning, however. The lack of a

common vernacular regarding what constitutes online learning has hindered the research, and muddied the conversations at the local and national level regarding online learning. The establishment of clear, consistent definitions and parameters of online learning will be a critical step to move the conversation forward in a productive manner.

A potential unintended outcome of the current practice of spring-semester NSSE administration is attrition bias. The impact on the data is an important consideration, but the potential impact upon the students is of more concern. Campuses are charged with increasing persistence and graduation rates. To do so, effective policies and practices must be implemented, evaluated, and potentially shifted to support a variety of student cohorts within the shifting educational realm. If those decisions are to be data-driven, or even data-informed, campuses need to be mindful of both how and when data are gathered from students. On a broader note, relying on one construct of what contributes to student success may be contributing to student attrition, and wasted campus resources.

Student engagement may be important to the success and persistence of online learners, but perhaps in different ways and to different degrees than for non-online learners. Similarly, the widely embraced National Survey of Student Engagement may offer vital insight into specific areas of engagement associated with online student success, which may be different from those more relevant to non-online learners. Campus policymakers and practitioners must be willing to reexamine the role of engagement between those different learners, the methodology used to gather data regarding each, and the existing student-support structures, which may not be designed to serve online students differently than non-online students. Such willingness must be accompanied by intentional efforts to align policies and practices with evidence-based approaches for

supporting the success and persistence of online learners. Such an alignment would have the potential to authentically alleviate the existing concerns regarding online learning, and more importantly, improve the ability of colleges and universities to increase degree-completion rates for students choosing to incorporate online coursework into their undergraduate portfolios.

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APPENDICES

Appendix A: National Survey of Student Engagement

*This is a facsimile of the U.S. English version of the online NSSE instrument as it appears to the student.
A paper-formatted facsimile of the survey which includes item numbering is available on the
NSSE Web site: nsse.iub.edu/html/survey_instruments.cfm*



0% complete

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

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

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

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

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

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

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

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

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

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

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

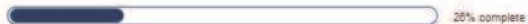
	Very often	Often	Sometimes	Never
Reached conclusions based on your own analysis of numerical information (numbers, graphs, statistics, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Used numerical information to examine a real-world problem or issue (unemployment,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

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

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

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

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

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

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

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

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

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

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

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

- All
- Most
- Some
- None

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

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

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How much does your institution emphasize the following?

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

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

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

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

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

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

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

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

- Excellent
 Good
 Fair
 Poor

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

- Definitely yes
 Probably yes
 Probably no
 Definitely no

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[Why do we ask about your personal background?](#)

What is your class level?

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

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

- Yes
- No

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

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

Of these, how many are *entirely online*?

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

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

- One
 More than one

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

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

Did you begin college at this institution or elsewhere?

- Started here
 Started elsewhere

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

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

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

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

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

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

What is your gender?

- Male
- Female

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

Are you an international student or foreign national?

- Yes
- No

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

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

Are you a member of a social fraternity or sorority?

- Yes
- No

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

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

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

- Yes
- No

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

- Yes
- No

Have you been diagnosed with any disability or impairment?

- Yes
- No
- I prefer not to respond

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

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

Which of the following best describes your sexual orientation?

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

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Appendix B: Missing Data for Each Engagement Indicator

Engagement Indicator	N	Missing EI Cases	Missing EI Cases %	Missing % Range Among Questions
Higher Order Learning	131	7	5.1	2.2 to 3.6
Reflective and Integrative Learning	137	1	0.7	0.0 to 2.9
Quantitative Reasoning	136	2	1.4	0.7 to 1.4
Learning Strategies	127	11	8.0	6.5 to 8.0
Collaborative Learning	132	6	4.3	0.7 to 2.2
Discussions with Diverse Others	127	11	8.0	7.2 to 8.0
Student-Faculty Interaction	136	2	1.4	6.0 to 8.7
Effective Teaching Practices	137	1	0.7	0.7 to 2.2
Quality of Interactions	98	40	29.0	8.1 to 9.4 *N/A range 3.6 to 39.9
Supportive Environment	115	23	16.7	14.5 to 16.7

BIOGRAPHY OF THE AUTHOR

Paul Dexter was born in Beverly, Massachusetts on August 18, 1970. He graduated from Beverly High School in Beverly, Massachusetts in June of 1988, and earned his Bachelor of Psychology degree in May, 1992 from Saint Michael's College in Colchester, Vermont. Paul earned his Master of Social Work degree from Salem State College in Salem, Massachusetts in May, 1995.

Paul began his professional career at Mid-Coast Mental Health Center in Rockland, Maine in 1995 as a dual diagnosis clinician specializing in work with youth and families. In April, 1998 he relocated to southern Maine where he was employed as a substance abuse counselor at Day One in South Portland, Maine. Paul was hired by the University of Southern Maine in Portland, Maine in September of 1998 as a substance abuse counselor and the Coordinator of Substance Abuse Prevention for University Counseling Services, where he was promoted in February 2001 to be the Administrative Manager & Outreach Specialist. Paul transitioned out of clinical social work in April, 2003 when he was hired to be USM's Assistant Dean of Student Life. In August, 2006 he established a new service department at USM aimed at supporting students in the college transition, becoming the Director of Early Student Success. This led to the creation of a larger institutional change to student services at USM in August of 2009, and Paul became the Coordinator of the Student Success Center on the Gorham, Maine campus. Paul was recruited by University leadership in January of 2011 to help develop a new academic support service model, co-creating USM's Learning Commons and transitioning to his current position as the Coordinator of Learning Support for USM.

Paul has taught career development and academic strategy courses for undergraduates at USM since September of 2004.

Outside of the university, Paul served as a Center Associate for the Higher Education Center for Alcohol and Other Drug Prevention from 2001-2008. He was hired as a Prime For Life course instructor AdCare Educational Institute of Maine in October of 2007, and continues to work as a lead instructor for weekend courses. Paul was recruited to become a Contract Trainer for the Prevention Research Institute in Lexington, Kentucky in July, 2011 to train practitioners around to country in the Prime For Life curriculum. Paul has been a Licensed Clinical Social Worker in the state of Maine since May of 1998. He was certified in the Myers-Briggs Type Indicator in 2005, and became a Global Career Development Facilitator in June of 2010. Paul completed his Sloan-C Certificate in Online Teaching in August, 2012.

Paul has served on the Executive Board of Maine's Higher Education Alcohol Prevention Partnership from 2001-2009, and was a board member of the Maine College Circle from January 2012 to June of 2013. He currently is a board member of Foundation 51 in Cumberland, Maine, charged with raising and distributing funds to support innovative practices in the MSAD 51 school district. Paul was inducted into the Phi Kappa Phi Honor Society in April, 2013, and serves on the Executive Committee of USM's local chapter. He is a candidate for the Ph.D. of Public Policy degree with a Concentration in Educational Leadership from the University of Southern Maine's Muskie School of Public Service in August, 2015.