Effects of Class Size on Selected Program Outcomes for a First-Year Seminar

David L. Strickland Jr.
EFFECTS OF CLASS SIZE ON SELECTED PROGRAM OUTCOMES

FOR A FIRST YEAR SEMINAR

By

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Dr. Stephanie M. Foote, Committee Member
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ABSTRACT

Massification, the trend toward college classes with hundreds and even thousands of students enrolled for a single course section has been well documented (Mangan, 2016; Hornsby, 2014) and the phenomenon has occurred in some first-year seminars (FYS) (Cheek, 2017) even though the FYS has been defined as small (<25 students) in the literature (Barefoot & Koch, 2015). What role does class size play in realizing the potential of the FYS a high impact practice promoting student success (Kuh, 2008)? The literature on FYS class size includes few true experiments with random sampling.

This study examined the effect of class size on program outcomes for a FYS using a quantitative, experimental design with random assignment of students to two class size conditions. Pre-test/post-test data were collected and analyzed on five benchmarks identified by the Center for Community College Student Engagement: making connections; high expectations and aspirations; clear academic plan and pathway; engaged learning; and academic support network. There were significant differences between pre- and post-test measures within each condition, but the difference between groups was not significant. While this study does not resolve the issue of class size, it adds some insight and suggests additional research examining class size for the FYS. The findings have implications for planning and implementing the FYS.
CHAPTER 1: INTRODUCTION

This chapter presents an overview and background for the current study followed by a statement of the problem, background and need for the research, purpose of the study, and the research questions with the associated hypotheses. The chapter concludes with a discussion of limitations and definitions for important concepts in the study.

Statement of the Problem

The overarching questions in this study were

- Does class size matter for the first-year seminar (FYS)?
- What is the impact of an FYS section with a very large student enrollment on engagement outcomes known to promote student success?
- Would the outcome gains differ between a large enrollment section versus small enrollment sections?

Much has been written about the issue of class size for all levels of education (Hoxby, 2000; U.S. Department of Education, 2004) including a copious number of articles that specifically addressed the issue in higher education (Feld & Grofman, 1977; McKeachie, 1990), but few have investigated first-year students in particular (Cuseo, 2007). Studies measuring the impact of large classes have addressed many outcomes. Most common were studies concerned with student achievement (measured by both grades and standardized instruments) (Kokkelenberg, Dillon, & Christy, 2005; 2008), but student satisfaction (Centra & Creech, 1976), student progression (Tinto, 1997), student retention, student graduation rates (Millea, Wills, Elder, & Molina, 2018), classroom interaction, and the quality of teaching and learning (surface learning versus deep processing) have also been examined (Barefoot, 1992; 2000; Kuh, 2008; Pascarella & Terenzini, 1991; 2005). However, few of those studies employed an
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experimental model with true randomization. Using an experimental model with true randomization will fill a gap in the current literature as well as provide reliable, scientific data to inform faculty’s and other decision-makers’ choices concerning numbers of students in small and large class sizes and the potential effect of this on outcome measures. Taken as a whole, the findings about the impact of class size on FYS have been ambiguous with a wide variety of methods, variables and interpretations.

Many colleges and universities have adopted the FYS, either as a part of a larger first-year experience program or as a stand-alone course (Barefoot, 1992; 2000). Research was needed to examine the impact of class size specifically for the first-year seminar because the FYS is a unique course designed to increase faculty-to-student, student-to-student, and student-to-resources interactions, and to help new students develop a sense of belonging in order to increase rates of progression, retention, and graduation for the students (Cuseo, 2007; Hattie, 2017). The a priori expectation was that students in small FYS classes will experience greater levels of interaction and be more likely to develop a sense of belonging than students in a very large FYS, and therefore will have higher rates of progression, retention, and completion (Cuseo, 2007).

As stated above, previous research has measured the impact of large classes on variables such as achievement (measured by both grades and standardized instruments), student progression, student retention, student graduation rates, classroom interaction, and the quality of teaching and learning (surface learning versus deep processing). However, studies are needed that explore the impact of large classes on engagement measures such as more frequent interaction with faculty, more meaningful interactions with faculty, greater involvement in
extracurricular activities, positive perceptions of self-as-learner, and student satisfaction (CCCSE, 2003-2018; Pascarella & Terenzini, 2005).

Research, such as the current study, on the impact of class size is needed for all of the above outcomes in the specific context of the FYS. First-year students have been included in these studies in recent decades, since a meaningful number of those classes that institutions chose to offer with very large enrollments were introductory level courses, usually taken by students during their first year of college. However, studies that address class size and its impact upon the first-year seminar in particular are scant and the current study will contribute to this body of knowledge.

**Background and Need**

A global trend of “massification” over the past decade has been documented by researchers. Massification refers to “the rapid increase in student enrollment that was witnessed towards the end of the twentieth century” (Hornsby, 2014, p. 712) and is connected to the issue of large classes. As a result of increased enrollment and economic pressures, many universities have enrolled very large numbers of students into single class sections such that it is not unusual for a single class to exceed 1000 students (Arvanitakis, 2014). Auditorium classes in U.S. universities are not new, but an emerging pattern in recent years was that universities are allowing class sizes to grow larger and larger. The trend of large classes was covered in a recent *Chronicle of Higher Education* article where classes of 100, 150, 180, 200, 400, 700, and greater than 1000 were described and where Kathryne McConnell, senior director for research and assessment at the Association of American Colleges & Universities indicated "the large classroom is not going away" given economic pressures (Mangan, 2016, p. A9).
This phenomenon in higher education is important because of the potential impact class size might have on student learning as well as student persistence to graduation. As pointed out above, variables such as student achievement (measured by both grades and standardized instruments), progression, retention, graduation rates, classroom interaction, and engagement measures such as more frequent and meaningful interactions with faculty and peers, greater involvement in extracurricular activities, positive perceptions of self-as-learner, and student satisfaction are all important for continued study. The question of the impact of class size on students in higher education in society has been an issue in research and debate for at least a century (McKeachie, 1990) and continues to be an important concern today (Benton & Pallett, 2013; Arvanitakis, 2014). Progression, retention and graduation rates have been outcomes of concern to the institutions of higher education, their faculty and administrators, and their funders (Millea, Wills, Elder, & Molina, 2018; Cartney & Rouse, 2006; Bettinger & Long, 2018). The impact on student satisfaction (DeShields, Jr., Kara, & Kaynak, 2005) and course evaluations (Marsh, 1987) or ratings of instructor effectiveness (Centra & Creech, 1976) are outcomes of concern for administrators and instructors. All stakeholders, especially students (Feld & Grofman, 1977), are concerned about and affected by the quality of courses (Fernandez, Mateo, & Muniz, 1999; Cuseo, 2007; Gilbert, 1995) and student performance (Chapman & Ludlow, 2010), including but not limited to grades (Morris, Sr. & Scott, 2014).

Many researchers have examined the effect of class size for college courses in general, but few studies appear in the refereed literature about class size specifically in the context of the first-year seminar (FYS). A potential explanation for this gap might be a common assumption that the FYS is, by definition, a small discussion-based course in which … there is a strong emphasis on creating community in the classroom” (Hunter & Linder, 2005, p. 275). Because of
its unique role (Cottrell, 2016; Kuh, 2008) in assisting new students with their transition into college, promoting social belonging and building community, many researchers and leaders in the First-Year Experience movement (Koch & Gardner, 2014) have suggested that the FYS course should be limited to small numbers of students per section (Barefoot, 2000; Young & Hopp, 2014). A consensus appears within the FYS literature that less than 25 students per section is appropriate for an FYS class, and some have determined that 15 students would be the ideal number for an FYS section (Cuseo, 2007). These size recommendations have been linked to the explicit goal of creating community and sense of belonging among first-year students. Given this consensus in the literature and the trend towards massification with its potential deleterious effects on student learning outcomes, the current study will add important data to this area by examining the topic more deeply.

This study examined the independent variable of class size in the first-year seminar college course as it affected selected desired benchmarks identified in the literature as critical to student success. The five student benchmarks in the current study, drawn from the Survey of Entering Student Engagement (SENSE) conducted by the Center for Community College Student Engagement (CCCSE, 2018; CCCSE, 2003-2018), included making connections between courses, having high expectations and aspirations, establishing a clear academic plan and pathway, participating in engaged learning, and developing an academic support network (CCCSE 2016; NOVA, 2016).

**Purpose of the Study**

If the trend to create very large classes for courses that are populated primarily by first-year students continues, it is reasonable to portend that university administrators would consider
large class sections for the FYS. Indeed, some institutions have already experimented with the strategy of placing hundreds of students into a single section of a FYS (Cheek, 2017).

The purpose of this study was to investigate the effect of class size on five engagement benchmarks taken from the SENSE study (CCCSE, 2018): 1) early connections, 2) high expectations and aspirations, 3) clear academic plan and pathway, 4) engaged learning, and 5) academic and social support network. The SENSE has been rigorously tested for reliability and validity and so was used in the current study. Please refer to Chapter 3, Methodology, for a more in-depth discussion of the use of the SENSE for engagement indicators. The study also measured next semester persistence as a dependent variable. The current study compared small classes of 15 students to a large auditorium class of 85 students. The small class maximum enrollment was set to 15 students because this class size was suggested in the research literature that specifically addressed class size of the FYS (Cuseo, 2007).

The students were randomly assigned to each class size condition in an experimental model. This study added to the existing research and will be important to decision-makers who need reliable scientific data to inform their choices concerning the number of students in FYS sections, and its effect on important indicators.

**Research Questions**

The overarching questions in this study were “Does class size matter for the FYS? What is the impact on an FYS section with a very large student enrollment on engagement indicators known to promote student success? Would the outcome gains differ between a large enrollment section versus small enrollment sections? The study hypotheses, developed using the SENSE benchmarks to measure engagement levels (H1 through H5) and retention (H6) follow.
Hypotheses

H_1: Students in the small class condition will score higher on the *early connections* questions than will students in the large class condition.

H_2: Students in the small class condition will score higher on the *high expectations and aspirations* questions than will students in the large class condition.

H_3: Students in the small class condition will score higher on the *clear academic plan and pathway* questions than will students in the large class condition.

H_4: Students in the small class condition will score higher on the *engaged learning* questions than will students in the large class condition.

H_5: Students in the small class condition will score higher on the *academic and social support network* questions than will students in the large class condition.

H_6: Students in the small class condition will be retained from fall to spring semester at a higher rate than will students in the large class condition.

Definitions

First-Year Students

Students in their first year of college, usually new to college, are referred to as first-year students. The National Center for Education Statistics (2018-2019) defines first-year student as “a student who has completed less than the equivalent of 1 full year of undergraduate work; that is, less than 30 semester hours (in a 120-hour degree program) or less than 900 contact hours” (p. 13) and this is the definition used for this study.

First-Year Seminar

The first-year seminar (FYS) is a course for new students that assists them with the transition into college and supports their success in college. It has been defined as “a course
intended to enhance the academic and/or social integration of first-year students by introducing them (a) to a variety of specific topics, which vary by seminar type, (b) to essential skills for college success, and (c) to selected processes, the most common of which is the creation of a peer support group” (Barefoot, 1992, p. 49). Additional detail regarding the FYS examined in the current study FYS is provided in subsequent chapters.

**High Impact Practice**

A high impact practice is a teaching and learning practice that has been widely tested and shown to be beneficial for college students from many backgrounds. The first-year seminar has been identified as a high impact practice (Kuh, 2008).

**Massification**

The term massification refers to “the rapid increase in student enrollment that was witnessed towards the end of the twentieth century” (Hornsby, 2014, p. 712). It often resulted in very large class sections including those that exceeded 1000 students (Arvanitakis, 2014).

**Limitations**

One major limitation of this study had to do with numbers of respondents and groups. There were not equal numbers of small and large sections in the study. The 130 students were divided into four groups: three small FYS sections of 15 students each and one large FYS section of 85 students. If additional sections, as well as additional students, could have been included, it would have strengthened this study. In this study, the researcher was also the instructor for all of the FYS sections that were examined. Using another instructor or instructors who were unaware of the details of the study, in a double-blind experimental model, would have reduced the potential for bias and therefore would have strengthened the study.
Another limitation may be the variables chosen for assessment in the current study. Past studies have stated that when learning or achievement was assessed by grades, then class size had a negative influence (i.e. the larger the class size, the lower the grades) but, at least in some studies where a standardized measure was used instead of grades, the evidence was not as compelling. This finding may lend some rationale to the findings of the current study. However, it is important to note that the current study examined the relative engagement rather than achievement.

The number and composition of the questions aimed at measuring expectations and aspirations in this study may not have been sufficient to fully address the variable and its potential ripple effects, such as self-fulfilling prophecy. A less than exhaustive measure of expectations and aspirations is a limitation of this study.

Ethical Considerations

This study underwent IRB review at the author’s graduate school. There were very few issues regarding ethical considerations. Students were offered an alternative if they did not wish to participate in the study, without any penalty. A detailed description of the study administration is provided in Chapter 3, Methodology.

Overview

This thesis has been organized to describe a study of the effects of class size on student success benchmarks for a first-year seminar. The following chapter describes existing research on the effects of class size in higher education, the issue of class size for first-year seminar, and relationship between that research and the current study. Chapter 3 presents the methodological framework for the study and includes a description of the experimental model, sampling, respondents, variables and instruments used for the study. Chapter 4 presents the findings from
the analyses of the outcome variables. The final chapter presents an interpretation of the results from Chapter 4 and an evaluation of the hypotheses in light of the findings. The concluding Chapter 5 also offers recommendations for future research and implications of the findings for FYS class size policy and practice.
CHAPTER 2: REVIEW OF THE LITERATURE

Many researchers have examined the effect of class size for college courses in general, but few studies appear in the refereed literature about class size specifically in the context of the first-year seminar (FYS). This study examined the independent variable of class size in the first-year seminar college course as it affected selected desired outcomes identified as critical to student success in the literature. The five student assessment outcomes included making connections, high expectations and aspirations, clear academic plan and pathway, engaged learning, and academic support network.

Introduction

This chapter presents a summary of the literature on class size in general with a focus on class size at the collegiate level and in the context of the first-year seminar. Although much research has been conducted on the topic of class size, the conclusions remain mixed with some studies finding large class size to be deleterious and other studies findings no difference or a positive effect of large class size on student learning and success indicators. Research that supports the use of large classes and research that supports the use of small classes were examined as well as conclusions where researchers attempted a synthesis or offered alternate perspectives. Finally, the issue of class size was explored in the context of the first-year seminar, an area where few studies are available; a gap that the current study seeks to address. This study used an experimental model to evaluate the effects of class size on student assessment outcomes. Therefore, a brief review of research and best practices literature regarding the outcome categories used in this study was included in this chapter.
An Overview of Research on Class Size

A great deal of literature on class size exists that examines the issue for primary and secondary educational settings as well as the collegiate level. These generally differ with regard to how “large” and “small” are defined. Both research and best practices resources addressing first year experience, first year seminars, and success in college are rich and varied. However, little is available to address the impact of class size on outcomes for the first-year seminar.

Defining Class Size Designations

Studies of class size in higher education have defined the designation “small class” and the designation “large class” in different ways. Table 1 provides some examples of the varying definitions used for the designations of small, medium, and large in the literature. The current study compared small classes of 15 students to a large auditorium class of 85 students. The small class maximum enrollment was set to 15 students because this class size was suggested in the research literature that specifically addressed class size of the FYS.

Table 1

<table>
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<th>Reference</th>
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<th>Small</th>
<th>Medium</th>
<th>Large</th>
<th>Very Large</th>
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<td>30-59</td>
<td>60-149</td>
<td>&gt;150</td>
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<tr>
<td>(Fernandez, Mateo, &amp; Muniz, 1999, p. 600)</td>
<td>1-9</td>
<td></td>
<td>30-59</td>
<td>60-149</td>
<td>&gt;150</td>
</tr>
<tr>
<td>(Monks &amp; Schmidt, 2010)</td>
<td>30</td>
<td></td>
<td>45</td>
<td></td>
<td></td>
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<tr>
<td>(Benton, Dan, &amp; Pallett, 2013, p. 10)</td>
<td>10-14</td>
<td>15-34</td>
<td>35-49</td>
<td>&gt;50; 101+</td>
<td></td>
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<tr>
<td>(Miles &amp; House, 2015, p. 118)</td>
<td>&lt; 25</td>
<td>25-50</td>
<td>&gt;50 (to 200)</td>
<td></td>
<td></td>
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<tr>
<td>(Cash, Letargo, Graether, &amp; Jacobs, 2017)</td>
<td>1-49</td>
<td>50-239</td>
<td>&gt;239</td>
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Class Size in Pre-College Instructional Environments

The research and other literature concerned with class size in elementary and secondary school levels are legion. Concern about the effects of class size on student performance for the K-12 grades prompted the federal Class-Size Reduction (CSR) Program, P.L. 105-277, in 1999.
According to a U.S. Department of Education report (2004) the CSR “represented a major federal commitment to help school districts hire additional qualified teachers, especially in the early elementary grades, so children would learn in smaller classes” (p. 1). The program had a goal of an average class size of 18 students for grades K-3. Experimental research that provided an impetus for the program included Tennessee’s Project STAR (Student-Teacher Achievement Ratio) and the Wisconsin Student Achievement Guarantee in Education (SAGE) study which both found that students in small classes (<18) out performed their peers in larger “regular” classes of 22-25. In contrast, Hoxby (2000) conducted a quasi-experimental study using longitudinal variation in the population for each grade in 649 elementary schools in Connecticut to estimate the effects of class size on student achievement and found that “class size does not have a statistically significant effect on student achievement” (p. 1239). She suggested that the gains observed in the STAR study might have resulted from the “Hawthorne effect” (p. 1241). The Hawthorne effect, also called the observer effect, refers to the situation in which experimental subjects modify their behavior simply because they are being observed rather than because of the variable under examination. Nonetheless the CSR program remained popular with at least 24 states adopting it by 2005 and mandating or incentivizing it in their public schools (Education Commission of the States, 2005). That class size has been a perennial public concern is evidenced by the inclusion of the topic in the 2012 U.S. presidential debate (Benton & Pallett, 2013).

These studies have limited application for the higher education venue because of the structural differences in the elementary school and college settings. What has typically been defined as “large” for primary and secondary instructional settings, 22-25 students per class, would be defined as small in studies that examine class size in higher education settings. For
example, Miles and House (2015) used the designations of greater than 50 students for large, 25 to 50 students as medium, and less than 25 students as small classes. The largest classes in their study had nearly 200 students. Another difference that limits application to higher education is the focus, or dependent variables, used for the studies. Achievement on standardized tests or criterion-referenced competency tests, issues of student deportment and classroom management, the amount of instructional time, the amount of physical space within the classroom, and the effect of size for populations of rural or economically disadvantaged children (Vandenberg, 2012) were topics of inquiry for studies of primary and secondary instructional settings. Dependent variables often examined in studies for higher education settings included academic achievement measured by grades (Chapman & Ludlow, 2010), student performance in a particular course (Morris, Sr. & Scott, 2014), student progression (Cartney & Rouse, 2006), retention rates (Millea, Wills, Elder, & Molina, 2018), graduation rates (Bettinger & Long, Mass instruction or higher learning? The impact of college class Size on student retention and graduation, 2018), student satisfaction (DeShields, Jr., Kara, & Kaynak, 2005), student evaluations of instructors (Miles & House, 2015), and perceived student learning (Chapman & Ludlow, 2010). The differences observed for these the two sets of studies, grade school studies compared to higher education studies, suggest that the higher education are most useful for making generalizations or drawing conclusions about higher education venues and populations.

Class Size in Higher Education

Class size has been a topic of research throughout the past century. Insights from the first published refereed studies to those conducted this year, although they had different findings, provide a valuable background for the current study.
Early Studies

In his historical review of research on college teaching, McKeachie (1990) asserted that the question of class size was “probably the first major question that research on college teaching tried to answer” (p. 190). He identified a 1924 study by Edmondson and Mulder as among the first studies of class size at the college level. The early study compared achievement of students in a large class of 109 students and a small class of 43 students for the same education course. Edmondson and Mulder did not determine that either the small or the large class context was more effective. Instead they found that “the small class had a slight edge on an essay and the midsemester tests, and the large class had a slight edge on quizzes and the final examination” (p. 190).

Studies that followed Edmondson and Mulder between 1924 and 1945 obtained mixed results with the distinction that large classes and lecture classes were favored for immediate recall of factual knowledge on a course examination but smaller classes and classes involving discussion were favored for outcomes beyond conventional achievement tests such as deep processing, critical thinking, problem solving, and long-term retention of information. Based on this evidence, McKeachie (1990) speculated that the degree to which class size affects learning rests with the teaching methods employed by the professors.

Class size remained a topic of research interest in the decades following the early studies described by McKeachie. Glass and Smith (1978) conducted a meta-analysis of research on the effect of class size on student achievement where they combined data from 77 studies representing nearly 900,000 students and concluded that as class size increases, achievement decreases. They reported similar findings in a companion article about the effect of class size on attitudes and instruction (Smith & Glass, 1980). Although their research covered all educational
levels, only a very small percent (3%) of the studies used in their analysis were based on the performance of students 19 years old or older.

The Glass and Smith findings may be contrasted with those of Williams, Cook, and Jensen (1984) who found that class size did not affect student achievement for university students. They analyzed final exam test scores for nearly 2000 students enrolled in 318 sections of 27 courses with class sizes ranging from 13 to over 1000. They found that “increasing class size from current levels of 20 to 40 up to several hundreds may not radically affect college student achievement” (p. 4) and suggested that “decisions about class size in colleges and universities should be based on issues other than concern about student achievement (e.g., classroom facilities, course budgets, convenience in testing and grading, students' demand for classes, students' attitudes toward the subject taught and college generally, faculty attitudes, etc.)” (p. 6).

**Class Size Paradox**

The phenomena of class size paradox emerged in studies by Feld and Grofman (Feld & Grofman, 1977). They observed that the average class size experienced by students could be dramatically different (many times larger) from the average class size experienced by faculty (which is the average class size reported for the institution). They examined data for 737 classes taught at a State university in Spring 1974 and found that students experienced a mean class size of 147 while the mean class size for the university was only 40. This occurred because the large variation that existed in class size at the institution resulted in the consequence that only a few students at a time experienced the smaller classes while very many students simultaneously experienced the larger classes. The larger classes in this study had enrollments ranging from 100 to 659. Specific examples included 206 in a biology section, 154 in chemistry, 289 in earth and
space studies, 318 in psychology, and 659 in music. At the same time, a study survey revealed that nearly all students preferred classes of 40 over larger classes and “practically no students preferred classes of size 10 or smaller to somewhat larger classes (20 or 30)” (p. 220).

Consequences of variation in class size include student dissatisfaction due to students’ having to experience more of the less desired large classes than more desired smaller ones, an overall decrease in attendance rates since students are less likely to attend the larger classes, and a larger amount of average student participation time in class (because “increasing the number of small classes while having a few extraordinarily large classes [means that] the amount of participation time per student could be substantially increased” (Feld & Grofman, 1977, p. 221). Even though the Feld and Gofman study was conducted in the 1970s, it is reasonable to assume that the class size paradox and its consequences might exist in institutions today where there are very large classes and a large variation in class size.

Recent Studies

Over the past decade researchers have identified a global trend whereby universities are offering very large classes. These classes have enrollments of thousands of students for a single course section.

Massification. The term massification has been used to describe “the rapid increase in student enrolment that was witnessed towards the end of the twentieth century [which] challenges the traditional form of universities as centres of elite education where only a select few gain access” (Hornsby, 2014, p. 712). It often involves class sections that exceed 1000 students (Arvanitakis, 2014). Some have drawn attention to the virtues of massification including “the democratization of knowledge” and “the opportunity to confront entrenched inequalities” (Arvanitakis, 2014, p. 736). Others find massification problematic for both society and higher
education. Allais (2014) argues that “much of the justification for expansion in higher education is not borne out by an analysis of the political economy of higher education” and asserts that “although the expansion of higher education through increasing class sizes appears to be necessary and inevitable, it is ultimately self-defeating” (p. 722).

It is widely known and documented in the literature that many colleges and universities have very large classes with hundreds of students in a single section. Consider a few documented examples. Magan (2016) described psychology classes of 400 to 1000 in Texas. Fukuzawa and Boyd (2016) reported teaching an anthropology class of over 700 students. Cash and associates (2017) gathered data on 171 offerings of 39 unique courses in the Department of Molecular and Cellular Biology (MCB) for a period between 2010 and 2014 at a Canadian university. They reported very large enrollments for about 24 percent of the courses in the department: Introductory biochemistry – 1166, structure and function in biochemistry – 578, genetics – 1104, molecular biology – 705, biology and genetics – 1189, biology of the cell – 772, microbiology – 274, and Immunology I – 427.

The trend toward more large class sections has prompted the question of how class size affects colleges and their students. Does class size matter and if so, in what way? How does class size affect students? How does it affect teaching and the quality of higher education?

**Conflicting findings.** An evaluation of research conducted over the past decade uncovers conflicting findings or conclusions concerning the effect of class size on students in higher education. In their early work, Volume 1 of *How College Affects Students*, Pascarella and Terenzini (1991) concluded that overall evidence suggested that class size made little or no difference in student achievement. However, in their latter 2005 volume, *How College Affects Students, Volume 2, A Third Decade of Research* (2005), they revised their conclusion based on
more recent studies. They wrote that “the literature we reviewed from the decade of the 1990s suggest we may need to revise … our 1991 conclusion that subject matter knowledge is acquired with equal proficiency in both large and small classes” (Pascarella & Terenzini, 2005, p. 94). Their revised position is that “other factors being equal, increasing class size has a statistically significant, negative influence on subject matter learning” (p. 94). They allow for one exception stating that when learning was assessed by grades then class size had a negative influence, but, at least in studies for some economics courses where a standardized measure was used instead of grades, the evidence is not as compelling. This finding may lend some rationale to the findings of the current study and are discussed under Chapter 1, Limitations.

John Hattie (2009; 2015; 2017) conducted a meta-meta-analysis: a synthesis of over 800 meta-analyses relating to academic achievement. His goal was to consider data from as much research as possible so that he could rank the practices that have the greatest effect on student achievement. His study encompassed all levels of learning including college but is most often cited in discussions about elementary and secondary education. In Hattie’s list, revised in 2017, of 252 influences and effect sizes, calculated using Cohen’s d, for student achievement, the variable reducing class size ranked 186 with a very small effect size of .21 (Waack & Hattie, 2018). This ranking is third in five general levels applied to the list and implies that reducing class size is “likely to have positive impact on student achievement” (Hattie, 2017, p. 2).

Hattie’s original work is certainly impressive but since his primary analysis targeted ages 4-20 and was not disaggregated to examine studies about college level achievement separately, it may have limited value in an analysis of class size at the college level. Subsequent to his original study, Hattie provided some interpretation of the data as it applies to higher education (Hattie, 2015) but did not address the reduction of class size as an intervention specifically. He concluded
that “although it is the case that most [of the studies he reviewed] are derived from the K-12 sector, there are still many from the postsecondary sector, and … the underlying messages underlying successful innovations are quite similar across the sectors” (p. 81). Hattie maintains that almost any intervention studied has produced positive results compared to the absence of the intervention but what is needed is to evaluate the value of an intervention in relation to the amount of desired result it produces compared to other interventions. In his analysis of college level studies, Hattie gave much attention to teaching methods and teaching attributes and noted that “about 20% to 25% of the total learning variance is in the hands of teachers” (p. 87). Hattie is not without critics in the educational research world. Some assert that his methods were not sound and therefore not reliable. Chief among many methodological charges made by Bergeron were two main errors: 1) miscalculation in meta-analyses, and 2) inappropriate baseline comparisons (Bergeron, 2017).

Effect of class size on students. Researchers have found class size to be correlated with academic achievement, academic interactions, and student satisfaction (course evaluations). Researchers have confirmed that class size is correlated with grades, specifically, that the average grade point declines as class size increases. Kokkelenberg, Dillon and Christy (2005) found this result persisted across ten diverse departments and after controlling for numerous potential extraneous variables including differing social structures. This study shows us only that grades decrease as class size increases. It cannot prove that greater learning occurs in smaller classes because their dependent variable, grades, is only a proxy for knowledge. It has also been reported that students have a more difficult time focusing and succeeding in the large class if lecture is the mode of instruction. Many researchers have found that average grades decline significantly with larger class size (Kokkelenberg, Dillon, & Christy, 2008).
Sociologists Beattie and Thiele (Beattie & Thiele, 2016) analyzed survey data linked with institutional data on class size for 346 college students to determine the effects of class size on student interactions with professors and peers about course content and about careers. This is important for first-year students because “classes serve as the institutional glue that solidifies academically-oriented network ties between students and their professors and peers” (Beattie & Thiele, 2016, p. 338). They discovered that students enrolled in larger classes had significantly fewer interactions with professors or with peers about what they were learning in the course. Disaggregation to sub-categories of students demonstrated that class size had a more profound negative influence on first-generation students, Black students, and Latino students (Beattie & Thiele, 2016).

Monks and Schmidt (2010) compared small economics courses with 30 students to larger classes with 45 students on four variables: student self-report of amount learned, instructor rating, course rating, and expected grade. They found that the larger classes had lower ratings for all four variables than did the small classes. It is important to note that since Monks and Schmidt defined small as 30 students and large as 45 students, the differences in the dependent variables that they observed were a result of increasing the class size by only 15 students. The current study examined course sections with a much larger ratio of difference in class size.

These studies have suggested some ways in which class size might affect students. In so doing, they have also confirmed the importance of class size as a variable suitable for inspection in the current study.

**Effect of class size on teaching.** Some researchers take the approach that “the teaching of students in larger classes would not be a cause for concern if the teaching/learning experience in large groups were the same or better than the experience in smaller groups” (Prosser &
Trigwell, 2014, p. 784) while others emphasize the deleterious effects large classes have on teaching. Based on extensive qualitative research (representing over 8,000 students and 400 teachers in 50 large first-year courses), Prosser and Trigwell (2014) argue that the student learning outcomes of thinking deeply, critically and creatively can be achieved in the large class (with hundreds of students) setting if the appropriate teaching approach is used. They differentiate between teaching that is (1) teacher-focused, teacher activity with the intention of transferring information to the students and teaching that is (2) student-focused, student activity with the intention of students changing their conceptions. The ineffective first approach, ITTF (information transmission/teacher-focus), is what most critics assume that teachers of large classes will be prone to do. The more promising second approach, CCSF (conceptual change/student focus), was documented in their study and is believed to produce desired student outcomes. However, these researchers believe that the CCSF approach is unlikely to be adopted by teachers of large classes unless their perception of the students is that their students have the appropriate characteristics for learning. In light of their findings and analyses, Prosser and Trigwell (2014) recommended that institutions where large classes are necessary or unavoidable due to constraints should promote the CCSF approach to teaching. They remarked, “this may not happen as easily or effectively as in smaller classes, but given the economies of scale now required in the modern university, a key issue is to support teachers in adopting more CCSF approaches to teaching” (Prosser & Trigwell, 2014, p. 795). Many studies have documented a statistically significant relationship between class size and student course evaluations such that the larger the class size, the more negative the evaluation results (Kokkelenberg, Dillon, & Christy, 2008; Bedar & Kuhn, 2008; Miles & House, 2015).
Synthesis and Alternative Views

Rather than conclude that large or small is better or worse, some researchers have offered the alternative view that large classes are well suited for certain contexts, such as introductory or survey courses that emphasize the recall of facts, while small classes are well suited for other contexts, such as courses that require deep processing, problem solving, critical thinking, or long-term retention.

Another alternative view focuses on research that proposes “factors other than class size are more important to educational quality” (Gilbert, 1995, p. 1) and that suggests ways to modify instructional delivery to enhance student learning in large classes. Gilbert asserts, “small classes are not necessarily better … in fact, what goes on in the classroom matters more than the size of the class” (Gilbert, 1995, p. 1). Gilbert described instructor and organizational characteristics that he considered to be dimensions of effective teaching.

A recent optimistic article in *The Chronicle of Higher Education* (Mangan, 2016) was consistent with Gilbert’s idea that good teaching can make a large class an effective learning environment. Mangan (2016) reports that “as budget cuts intensify pressure to pack more students into these classes, universities are experimenting with ways to liven them up” (p. A8) and then describes several ways that some universities are trying to make the large class feel small. One case is the synchronous massive online course (SMOC) developed at the University of Texas - Austin. The SMOC professor teaches a small class face-to-face while simultaneously beaming in hundreds of other students who are in a location of their choosing, such as home. It is a combination of a traditional class and an online class that is live in real-time and the course uses advanced technology to give “the classroom a more dynamic and personal feeling” (Mangan, 2016, p. A10). Another case is the non-technological approach of a chemistry
professor who teaches an auditorium class of 400 students. She makes the class feel small by breaking the class into “groups of two to four to work on problems while a dozen undergraduate and graduate teaching and learning assistants circulate through the room” (Mangan, 2016, p. A11).

Using teacher-designed student activity as a means of enhancing student engagement to promote student learning has been proposed in recent studies (Prosser & Trigwell, 2014). Singer-Freeman and Bastone (2016) describe the intentional implementation of research based practice, both in and out of the classroom, that work together in what they call “pedagogical alignment” to make a large introductory lecture course “feel small” and to increase student engagement and success. The report demonstrated how the instructors designed a child development course as an authentic context to improve student success by including evidence-based practices, namely: learning communities, mentoring, brief psychological interventions, values affirmation, sense of belonging, growth mindset, and grit. Specific strategies used to engage students in the large class were active learning, assessment, and e-portfolio-based assessment (Singer-Freeman & Bastone, 2016).

One recent (2016) research-based example of how instructors sought to increase student engagement in a large class and thereby improve teaching and learning for the large class was that of Fukuzawa and Boyd at the University of Toronto, Mississauga. In an anthropology class with 725 students, Fukuzawa and Boyd used technology (a Monthly Virtual Mystery program) and online discussion groups to build connections between students who collaborated on a problem-based learning (PBL) project in sub-groups of 50 students each. They allowed students to self-select into the PBL group project or, alternatively, to complete a passive learning project where they watched short videos weekly on line and answered questions about them in a reader.
The students self-selected into each option almost evenly with a few more choosing the passive option. The researchers observed mixed results. Participation and completion rates were high for both groups and there were no significant differences in the distribution of final grades between the two groups. However, they did experience difficulties implementing the PBL project because 50 students in a single online discussion sub-group proved to be too many people for the collaboration to be effective. While the students rated the Monthly Mystery activity as a valuable learning tool, they also complained about redundancy in the online discussion board and an unequal distribution of the work-load among collaborators. Fukuzawa and Boyd conclude that PBL is a way to increase student engagement in large introductory courses and that it is beneficial to first year students because it “plants the seeds of self-directed learning that can be nurtured in higher years” (Fukuzawa & Boyd, 2016, p. 10). The findings of their study may be a source of hope for instructors who are forced to teach very large sections and have no choice except to make the best of it but the study does not preclude the notion that these students could have experienced the benefits of PBL in a small class context where the problems of redundancy and concerns over unequal distribution of work could be more easily alleviated.

**Class Size for the First-Year Seminar**

The phenomenon of very large classes with hundreds of students in a single section continues as an issue in higher education, is an experience common to new students entering college, and even occurs in some first-year seminars (Cheek, 2017). In her summary of the findings for the National Survey of First-Year Curricular Practices, Barefoot (2000) reported that “first-year students at large universities are also likely to experience one or more very large classes (> 100 students), especially in the sciences and social sciences” (p. 2). Barefoot suggested that this practice along with others creates or leads to an “implicit bargain many
institutions strike with first-year students—"Don’t expect too much of us and we won’t expect too much of you”” (p. 6).

The First-Year Seminar

Defining the first-year seminar. Definitions of FYS often include the integration of first year students in both academic and social realms (Barefoot, 1992). This is accomplished by exposing students to various specific topics, essential success skills, and selected processes, such as peer support groups (p. 49). The Association of American Colleges & Universities (AAC&U) (2007) added that “first-year experiences place a strong emphasis on critical inquiry, frequent writing, information literacy, collaborative learning, and other skills that develop students’ intellectual and practical competencies” (p. 53). Bers and Younger (2014) examined the first-year seminar as it has been experienced specifically in the context of community colleges. They reported, “the seminar provides a forum, typically in the first term, for new students to examine their entry to college and the implications it has for their identity, their time, and their intellectual growth” and “Seminars are offered in a myriad of formats (preterm immersion, standard class schedule, retreats); are known by various names (e.g., FYE 101, Success Seminar); and are taught by varying combinations of faculty, staff, and administrators” (Bers & Younger, 2014, p. 80).

The National Survey of First-Year Seminars has been administered every three years since 1988. The most recent (and the ninth) iteration was in 2012-2013. The survey revealed that "first-year seminars are in place at more than 90% of four-year institutions and over 80% of two-year institutions" (Skipper, 2017, p. 7). Seven types of seminars were described: Extended orientation seminars, academic seminars with generally uniform content, academic seminars on
various topics, preprofessional seminars or discipline-linked seminar, basic study skills seminars, hybrid seminars, and other (Skipper, 2017).

**History of the first-year seminar.** That programs or seminars for freshmen is deeply rooted in the history of higher education is evident from the historical research literature (Fitts & Swift, 1928; Dwyer, 1989; Gordon, 1989; Thelin, 2005; and Koch & Gardner, 2014). It would appear that the advent and proliferation of first-year seminars was driven by concern for the needs of students for more than a century if not for most of the history of higher education in America. Gordon points out that concerns about helping students adjust to the social and academic challenges of college have appeared in the historical literature as far back as 1910 (Gordon, 1989). Hunter and Linder (2005) confirm that “special attention to the first year of college is not new” (p. 279). The focus on freshmen in the 19th century can be traced to a purposeful assignment of freshmen to faculty advisors (Johns Hopkins University in 1877 and Harvard in 1889) and to student orientation (Reed College in 1911). Over the first half of the 20th century, freshmen orientation efforts appeared to be mostly a student services component of institutions. By 1948, these orientation classes were offered in 43% of colleges (Hunter & Linder, 2005). Hunter and Linder’s findings of their 2005 national survey reported that “74 percent of the responding institutions reported the existence of one or more first-year seminars” (p. 278) for the year 2000. The orientation course became almost unheard of during the mid-1960’s but, commencing in the 1970s, there was a resurgence of interest in freshmen orientation resulting in the emergence of the freshman FYS.

The modern iteration of the FYS emerged in the early 1970s under the direction of John N. Gardner who developed the FYS called “University 101” at the University of South Carolina (Koch & Gardner, 2014). Assessment research of Gardner’s program demonstrated a statistically
significant improvement in retention and other important success outcomes for students who had the course over those who did not have the course. This drew the attention of many other institutions that wanted to replicate the retention enhancing initiative. This led to the first national conference on first-year orientation in 1981 and launched the first-year experience movement which is still celebrated with annual conferences to this day (Koch & Gardner, 2014).

In the decades following the first FYE conference, the number of colleges adopting a first-year experience program and/or a first-year seminar steadily increased. Hunter and Linder portend a bright future for the first-year seminar: "we believe that first-year seminars have the potential to be one of the most dynamic and enduring curricular initiatives of the future" (Hunter & Linder, 2005, p. 291).

**Effectiveness of First-Year Seminar.** George Kuh (2008) identified the first-year seminar as a high-impact practice (HIP) in higher education. A high-impact practice is a teaching and learning practice that has been widely tested and shown to be beneficial for college students from many backgrounds. High-impact practices described by Kuh include first-year seminars and experiences, common intellectual experiences, learning communities, writing-intensive courses, collaborative assignments and projects, undergraduate research, diversity/global learning, ePortfolios, service learning - community-based learning, internships, and capstone courses and projects (Kuh, High-impact educational practices: What they are, who has access to them, and why they matter, 2008). Kuh (2008) has identified the FYS to be specifically effective as a HIP.

Pascarella and Terenzini (1991, 2005, 2016) synthesized thousands of individual research investigations about how college affects students in three volumes which cover the period from 1967 to 2013. As a part of their work, they completed a comprehensive study of the research
about first-year seminars and summarily concluded that "whatever the procedure, the research points to the same conclusion, indicating positive and statistically significant net effects of FYS participation (versus nonparticipation) on persistence into the second year ... or attainment of a bachelor's degree" (Pascarella & Terenzini, 2005, p. 402). They identified many other positive effects of FYS participation that were demonstrated in the research literature including better academic performance, more frequent interaction with faculty, more meaningful interactions with faculty, greater involvement in extracurricular activities, positive perceptions of self-as-learner, and student satisfaction (Pascarella & Terenzini, 2005).

**Ideal Size for the First-Year Seminar**

Definitions for the first-year seminar found in the research literature consistently describe it as small. “A seminar, by definition, is a small discussion-based course in which students and their instructors exchange ideas and information ... [and where] there is a strong emphasis on creating community in the classroom” (Hunter & Linder, 2005). In presenting the history of the seminar, Gordon reported that these courses were generally taught in small groups or small classes rather than auditorium size classes (Gordon, 1989). Koch and Gardner describe the first-year seminar “as small enrollment courses that help beginning students with their academic and social transition” (Koch & Gardner, 2014, p. 16). Barefoot defined the first-year seminar as “a small group of first-year students, as in a college or university, engaged in study and research under a member of the faculty and meeting regularly to exchange information and hold discussions” and she specified a ceiling stating that small means “~25 or fewer students” (Barefoot & Koch, 2015, p. 3). Not only did these trusted experts use the term “small” to define the FYS, they also attached activities to the seminar, such as creating community in the classroom, for which a smaller more personal setting is ideal. Even some proponents of large
classes have agreed that large classes are not a good fit for first-year students as Gilbert reported, “first-year college students prefer small classes and upper division students prefer large classes” (Gilbert, 1995, p. 3). Perhaps most importantly, “due to the small class size [capped at 22 students], first-year seminars aid students in developing skills that can be used in other classes and encourage them to participate” (p. 3).

Joe Cuseo (Cuseo, 2007) drew on a robust review of 95 articles in the literature to argue that the first-year seminar should be taught in small class settings, concluding that the ideal size for an FYS section would be 15 students. He observed that some studies that examined the issue of class size operationalized the variable of size into collapsed categories (often only two categories) such that all classes in a high range, such as over 50 students, were compared to classes within a lower range, such as 25 or less students. Such studies do not reveal whether the relationship between class size is linear, with gains decreasing incrementally, or whether there is a threshold size after which the gains drop off precipitously. Based on his interpretation of the research, Cuseo speculates that 15 students would be “a specific threshold point or absolute number below which the benefits of smaller class size become magnified” (Cuseo, 2007, p. 11).

Cuseo cited five studies where classes of 15 students were specifically identified and associated with positive outcomes. These included:

- Light (2001, p. 45) - undergraduates considered “fifteen or fewer people” to be “small”;  
- Fischer and Grant (1983) - defined small classes as 15 or fewer students;  
- Schnell, in Barefoot (1993) – student evaluations of FYS were significantly higher for sections of 15 or fewer students;
• Centra & Creech (1976); Marsh (1987) – classes of 15 or fewer had better evaluations than classes of 16 or higher; and

• NCTE Guideline (2004) – “National Council of Teachers of English claims that 15 or fewer students is the optimal class size for courses in college writing, and in remedial or developmental writing courses.” (Cuseo, 2007, pp. 11-12)

Cuseo artfully articulated his belief that placing first year students in large auditorium size classes socializes them to develop deleterious perspectives and approaches to learning that stay with them throughout the remainder of their college experience. “Placing college neophytes in large, lecture-laden classes that are conducive to passive spectating may initiate maladaptive mental habits or predispositions to learning that linger beyond the first year of college” (Cuseo, 2007, p. 2). He then provided support from the literature for eight conceptual arguments against large-sized classes. These, ways in which large classes militate against desired outcomes and undermine course and institutional objectives, were:

(1) increased faculty reliance on the lecture method of instruction, (2) less active student involvement in the learning process, (3) reduced frequency of instructor interaction with and feedback to students, (4) reduced depth of student thinking inside the classroom, (5) reduced breadth and depth of course objectives, course assignments, and course-related learning strategies used by students outside the classroom, (6) lower levels of academic achievement (learning) and academic performance (grades), (7) reduced overall course satisfaction with the learning experience, and (8) lower student ratings (evaluations) of course instruction” (Cuseo, 2007).

Prosser and Trigwell (2014) challenged Cuseo’s eight conclusions stating that if quality teaching occurs and effective teaching methods are used in some large classes and not others,
then “we might learn from those contexts to diminish or even reverse the effects described in most, if not all of Cuseo’s conclusions” (p. 784). However, while Prosser and Trigwell’s analyses of teaching in large classes addressed teaching in the context of the first year of college, it did not isolate instruction in the first-year seminar, a unique teaching context that might require a small class context to be effective.

**FYS Outcomes Dependent on Class Size**

Researchers in higher education have evaluated the question of class size in the light of numerous outcomes that are deemed important for both student and institutional success. These have included student achievement, student satisfaction, student progression, retention rates, and graduation rates. It is appropriate that a study of class size for the first-year seminar should evaluate the question in the light of outcomes that have been identified as critical in the literature about the assessment of first year seminars.

The outcome measures for this study emerged from the research and best practices literature germane to the first-year seminar and critical to student success. The current study adopted five of the six benchmarks employed by the Center for Community College Student Engagement (2009) in the Survey of Entering Student Engagement (SENSE) (CCCSE, 2018; NOVA, 2016). The five benchmarks were 1) early connections, 2) high expectations and aspirations, 3) clear academic plan and pathway, 4) engaged learning, and 5) academic and social support network. Retention to the subsequent semester was also used as a measure of student success for the current study. Chapter 3, Methodology, presents a complete description for each of the benchmarks linking them with the research and best practice literature and the specific questions developed to address each one.
Relationship Between Existing Research and Current Study

The existing research on the effects of class size is extensive both for elementary and secondary educational venues and for colleges and universities. Studies conducted in higher education settings have addressed the issue for a specific college course, usually a freshman gateway course, college courses in general that students are likely to experience during their first year, or college courses in general experienced anytime during a degree program. Few studies employed a true experimental model with random assignment. With a single exception, (Cuseo, 2007), research that specifically addressed class size for the first-year seminar was scant. The Cuseo article, *The empirical case against large class size: Adverse effects on the teaching, learning, and retention of first-year students* was, for the most part, in the format of a literature review rather than a report of research conducted by the author. The paucity of studies on class size for first year seminars may reflect a general consensus that the first-year seminar is most effective as a small class.

What is missing from the body of research are studies, especially true experimental studies, that addressed the impact of class size for first-year seminar courses. Attention to the first-year seminar is needed because the FYS is a course of unique character and purpose. The putative hypothesis is that FYS classes need to be small to effectively address the outcomes for the course or program. Additional research on the impact of class size, specifically for FYS courses, is needed given the ongoing trend for colleges and universities, pressured by budget and space constrains, to place hundreds of new students in a single course section and the potential for the FYS to be one of those classes. The current study seeks to fill this gap in the literature by using a true experimental design with random assignment to class size conditions to exam the effect of class size on student success benchmarks for an FYS course.
Theoretical Framework

The theoretical framework for this study centered on student engagement, specifically as reflected in five of the six benchmarks developed for the Survey of Entering Student Engagement (SENSE) by the Center for Community College Student Engagement (CCCSE) at the University of Texas, Austin (CCCSE, 2018). According to the CCCSE, “the SENSE benchmarks of effective practice with entering students denote areas that educational research has shown to be important to entering students' college experience and educational outcomes” (CCCSE, 2003-2018, p. 1). The benchmarks were not intended to represent latent constructs. Rather, the surveys that employed these benchmarks were designed for “consequential validity” (p. 330) meaning they were intended to provide meaningful and actionable data that would be useful to institutions for decision making (McCormick & McClenne, 2012).

Alexander Astin’s I-E-O theory (Astin A. W., 1993, 2002) also provided insight for this study. He developed the input-environment-output (I-E-O) theory (Astin A. W., 1993, 2002). The model is useful for conceptualizing the developmental needs of new students (input), the goals we have for those students (output), and the design of a seminar that may best address those needs (environment). Astin defined inputs as “those personal qualities the student brings initially to the educational program”. Friedman (2012) explained that “for assessment purposes, an input would be any pre-enrollment variable that could conceivably affect the outcome” (p. 13). Environment refers to the student’s actual experiences during the educational program. The terms “intervention” or “treatment” are sometimes used to describe what is meant by environment in the IEO model. Finally, outputs refer to the “talents” we are trying to develop through the educational program. This study draws insight from the I-E-O model insofar as the pretest was a proxy for “input” by representing the position of the students at the beginning of
the semester and their entrance into the institution with regard to the benchmark outcomes and
the posttest was proxy for the “output” by representing the position of the students after having
experienced the “environment” represented by the FYS. The background of the students
constituted the input and was controlled for by random assignment. This study seeks to evaluate
the output for environments of varying class size conditions.
CHAPTER 3: METHODOLOGY

This chapter presents a description of the methods used for this study. The design of the study is described followed by descriptions of the setting, participants, procedures for random assignment, data collection instruments, data collection procedures, data analysis, and the procedures used for the protection of human subjects.

Design

The main question driving this research was whether the number of students in a first-year seminar (FYS) impacts engagement outcomes that are associated with overall student success. A pretest – posttest experimental design with random assignment was employed to determine if a difference in student success outcomes existed between the FYS in two class size conditions, large and small. The students in the study were all enrolled in a single section (or class) of the FYS course. A stratified random sampling procedure was then used to assign student participants to each condition. Class size was the independent variable and was operationalized as large, having 85 students, or small, having 15 students. The five dependent variables were drawn from the benchmarks previously determined to correlate with student success and used for a national study of student engagement, the Survey of Entering Student Engagement (SENSE), conducted by the Center for Community College Engagement (CCCSE, 2018). The dependent variables were 1) early connections, 2) high expectations and aspirations, 3) clear academic plan and pathway, 4) engaged learning, and 5) academic and social support network. Descriptive data about the participants was collected from institutional records and a demographic survey. Pre-post-test surveys were created that included a group of questions for each of the five outcome categories. These groups of questions were similar to those used for the SENSE study (CCCSE, 2018) except that they were constructed by the researcher to match the specific resources,
lessons, and students at the institution for this study. The benchmarks and question items used in the current study are presented in Table 2 and the SENSE benchmarks and question items are presented in Appendix D. As such the questions had face validity. The findings from these measures appear in chapter four.

**Setting and Participants**

**The College**

This research was conducted for a first-year seminar at a public, liberal arts institution in southeast Georgia that offers associates degrees in academic major pathways designed to seamlessly transfer to four-year colleges and universities within the State system. The institution also offers collaborative programs in occupation-related fields and targeted baccalaureate level degrees. At the time of the study, the FYS was a one semester credit hour – two contact hour course that was required for graduation and was a first semester course for all new students. The college had a student population of approximately 4000 on three campuses, the main campus and two satellite campuses. The participants for this study were students only from the main campus.

**The Course**

The FYS in this study is classified as a combination of the “academic seminars with generally uniform content” and the “extended orientation seminar” identified by Skipper in her review of the 2012-2013 National Survey of First-Year Seminars (Skipper, 2017, pp. 10-11). The primary course content delivered each week in the class sessions is academic in nature and is required for courses that are part of the core curriculum as specified by the University System of Georgia. However, extended orientation and skills content is delivered in required workshops which supplement the academic course.
Table 2

Survey Questions and Corresponding Outcomes.

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Operationalization / Survey Questions</th>
</tr>
</thead>
</table>
| Making Connections | How often did you attend a campus organization or club meeting?  
| | How often did you attend an EGSC sports event?  
| | To what extent do you feel like you belong at this college?  
| | To what extent do you feel there is someone (such as a faculty, staff, administrator, librarian, tutor, etc.) who really knows you on an individual basis? |
| High Expectations / Aspirations | How often did you turn in an assignment late for any of your classes?  
| | How often did you come to any of your classes without completing the readings or assignments before class?  
| | How often did you refer to the syllabus for any of your classes?  
| | How often did you take notes in any of your classes?  
| | How often did you make a list of the tasks you need to do to study for any of your classes?  
| | How often did you arrive late to any of your classes?  
| | To what extent do you believe that your instructors want you to succeed in college?  
| | To what extent are you confident that you will graduate from college? |
| Clear Academic Plan and Pathway | Have you selected a major?  
| | Do you know what classes you need to take from this semester until you graduate?  
| | Have you created a written graduation plan in which you listed all of the classes you need to graduate? |
| Engaged Learning | How often did you participate in a study group outside any of your classes?  
| | How often did you discuss any assignment or grade with any instructor?  
| | How often did you ask any of your professors for help?  
| | How often did you use the SOAR technique to study for any of your classes?  
| | How often did you answer a professor’s question in any of your classes?  
| | How often did you ask the professor a question in any of your classes?  
| | How often did you participate in any learning opportunities on campus (Convocation, special speakers, etc.)? |
| Academic Support Network | How often did you get tutoring help or other assistance from the ACE?  
| | How often did you get help from any professor during office hours?  
| | How often did you study in a group outside of class time? |
The content, assignments, and schedule for the course were listed on the syllabus which is presented in Appendix A. The students attended 15 class sessions or special events on campus, completed chapter quizzes, created an electronic portfolio, and completed three online tutorials including 1) AlcoholEdu for alcohol and substance abuse prevention, 2) Haven for sexual assault awareness and prevention, and 3) How to Get the Most Out of Studying for approaches to studying. The lecture and discussion topics for the class sessions included transition to college, organization, mindset, learning theory (such as memorization versus deep processing and surface versus deep learning), metacognition, metacognitive strategies for college level reading, college level writing, physical and mental health, and financial management. They also attended five workshops: 1) a resume workshop presented by experts from Human Resources, 2) a library workshop presented by the Library Director and library staff, 3) a conduct workshop presented by the Director of Student Conduct and the Chief of Police, 4) a career exploration workshop presented by an intern from the counseling office where they completed the Focus2Career online inventory, and an advisement workshop presented by the Director of Advisement and staff. In addition, they were required to make an appointment to meet with their faculty advisor and complete an advisement assignment. The advisement assignment included a written graduation plan/pathway and registration plan for the next semester or, if the student was transferring, then a written transfer plan which referenced the catalogue requirements for the college to which they were transferring. The portfolio project accounted for 30 percent of their semester grade and was intended as a project that students would begin in their first semester and then update each semester of their college experience. The portfolio took the form of a website with a welcome page, where students usually discussed their major interest and long-term career plans, and separate tabbed pages containing a resume and examples of the students’ learning, service, and
achievement (including writing samples, academic projects, club and organization involvement, service projects, and any other category where the student had artifacts to present).

**Experimental Design**

This research fits the true experimental design classification described by Campbell and Stanley (1963) and most closely resembles the pretest-posttest control group design (Campbell & Stanley, 1963). Specifically, “equivalent groups were achieved by randomization” (Campbell & Stanley, 1963, p. 13) for this study. Figure 1 presents the experimental model used for this study.

![Figure 1. Experimental model diagram of the procedures for this study](image)

**Random Assignment**

As depicted in the model diagram (Figure 1), the student participants were randomly assigned to the two experimental conditions using the following procedure.

1. All new students were required to enroll in the FYS and were placed into a single course section by the academic advisors during registration, thus creating the sample. It was a saturated sample since the sample and the population (all new students) were the same.

2. The population of students was subdivided into meaningful categories for stratification purposes. The categories were sex and learning support status. Since two-thirds of the students were assigned to the large class size condition and one-third to the small class condition, the
population was stratified by sex and learning support status according to the same ratio. Then individuals were randomly assigned from those stratified categories. Table 3 presents the distribution of categories for the stratified random sampling procedure.

3. Students were then randomly assigned from the stratification categories to the two conditions of small classes and large classes (proxies for control and experimental groups) using a table of random numbers. Oversampling was used to account for potential attrition.

4. All students met together in the auditorium for the first week of classes while registration changes via drop/add were allowed. Then during week two they were assigned to their respective groups. The result produced three groups of 15 students (small class condition) and one group of 85 students (large class condition).

Table 3

Schedule for Stratified Random Assignment into Class Size Conditions.

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
<th>Random Assignment</th>
<th>Number</th>
<th>Percent of all Respondents</th>
<th>Percent of Males</th>
<th>Percent of Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Learning Support Male</td>
<td>32</td>
<td>Small</td>
<td>11</td>
<td>8.15</td>
<td>16.18</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Large</td>
<td>21</td>
<td>15.56</td>
<td>30.88</td>
<td></td>
</tr>
<tr>
<td>Non-LS Male</td>
<td>36</td>
<td>Small</td>
<td>12</td>
<td>8.89</td>
<td>17.65</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Large</td>
<td>24</td>
<td>17.78</td>
<td>35.29</td>
<td></td>
</tr>
<tr>
<td>Total Males</td>
<td>68</td>
<td></td>
<td>50.37</td>
<td></td>
<td>100.00</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Learning Support Female</td>
<td>27</td>
<td>Small</td>
<td>9</td>
<td>6.67</td>
<td>13.43</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Large</td>
<td>18</td>
<td>13.33</td>
<td>26.87</td>
<td></td>
</tr>
<tr>
<td>Non-LS Female</td>
<td>40</td>
<td>Small</td>
<td>13</td>
<td>9.63</td>
<td>19.40</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Large</td>
<td>27</td>
<td>20.00</td>
<td>40.30</td>
<td></td>
</tr>
<tr>
<td>Total Females</td>
<td>67</td>
<td></td>
<td>49.63</td>
<td></td>
<td>100.00</td>
<td></td>
</tr>
<tr>
<td>Total Respondents</td>
<td>135</td>
<td></td>
<td>100.00</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Class size was the independent variable and the six outcome benchmarks were the dependent variables. Data about the outcomes was collected using a pretest survey during weeks three-four of the semester and posttest data concerning the outcomes was collected during week 14.

**Data Collection Procedures**

Sources of data for this study were 1) institutional data, 2) a demographic survey (survey #1), 3) a pretest survey (survey #2), and a posttest survey (survey #3). Appendix B presents a copy of the demographic survey questionnaire. Appendix C presents a copy of the pretest (and posttest since they are the same) survey questionnaire. The institutional data provided the demographic data necessary to stratify the sample and to measure semester-to-semester retention. Survey #1 was used to collect relevant demographic data that was not available via the institutional records. Survey #2 and survey #3 were the pretest and posttest respectively. These were used to collect data about the student participants and the dependent variables. The pre and post test data were collected during spring 2018 with next semester retention data collected in fall 2018.

**Instruments**

Survey #1 was a demographic survey that students completed on the first day of classes. It provided demographic information that was not available from the institutional database, specifically, first-generation status, degree of non-academic responsibilities (such as primary responsibility caring for family members, jobs on or off campus, and/or volunteer work), degree of campus involvement (such as on campus jobs, and/or participation in student organizations). This information was useful to facilitate disaggregation during analysis and to rule out or
measure the impact of extraneous variables addressed on the questionnaire. Analysis of this data extends beyond the primary research question of this study (effect of class size on the five specific engagement outcomes listed and next semester retention) but it has value for follow-up research involving exploration of these extraneous variables. Some research has suggested that placing students into very large classes for their first semester of college has greater deleterious effects on first generation students, minority students, or any students who are underprepared for college than for students in general (Beattie & Thiele, 2016; Chao, 2007; Choy S., 2001; Pascarella, Pierson, Wolniak, & Terenzini, 2004; Ward, Siegel, & Davenport, 2012). There is also some evidence that being more involved on campus via an on-campus job, or participation in campus organizations results in a greater sense of belonging, more meaningful interactions with faculty and staff (i.e. who know the student’s name) a sense of community, and academic gains (see pretest-posttest questions 12, 13, and 23). The questionnaire for survey #1 is presented in Appendix B.

Survey #2 was the pretest. It included six demographic questions and 25 questions designed to measure the five outcome variables. The response choices for these questions allowed the respondent to select a ratio level number on a scale between 0 and 100 or to slide the marker to the place of their choice on the number line to indicate the degree of their answer. Questions 8 through 13 asked the respondent to indicate how much they agreed. The number line was labeled “Disagree” over the number zero, “Agree” over the number 50, and “Strongly Agree” over the number 100 on the number line. Questions 14 through 31 asked the students to indicate “how often” an experience occurred. For these questions, the number line was labeled “Never” over the number zero, “Sometimes” over the number 50, and “Always” over the number 100 on the number line.
Since no single question could yield data that could adequately measure the target outcomes, there were three to eight questions linked to each of the dependent variables. The content of the pretest (survey #2) and posttest (survey #3) questionnaires were the same except for the time factor identified in the questions. The pretest was administered at the beginning of week 4 and asked students to answer based on their experience “so far this semester” which was the first two weeks of instruction (e.g. weeks two and three) following schedule adjustment and welcome week. The posttest was administered during week 14 which was two weeks prior to final exams. The questions on the posttest were prefaced with the phrase, “in the past two weeks” which referred to weeks 12 and 13. The posttest was administered two weeks prior to final exam week because the intent of the survey was to measure the participant’s typical behavior near the end of the semester. It was important to avoid administering the posttest too close to finals week as students might behave differently the week before finals than was their normal habit.

Placement of the pretest and posttest at these specific times during the semester allowed measurement of student experience at the beginning of the semester and again at the end of the semester. The time between the two measurements is when the students experienced the experimental stimulus of participation in the FYS. A copy of the questionnaire for survey #2 is presented in Appendix C. A separate copy of survey #3 is not provided since the content of the posttest matched that of the pretest.

**Variables**

The independent variable was class size and was operationalized as an enrollment of 85 for the large class condition and 15 for the small class condition. There were six dependent variables. Five of these were adapted from the benchmarks used for the Survey of Entering Student Engagement (SENSE) and the sixth dependent variable was next semester retention.
Next semester retention was measured using institutional data and was operationalized as the percent of students who were retained or successfully transferred for the semester subsequent to completion of the FYS. The five variables adapted from SENSE were 1) early connections, 2) high expectations and aspirations, 3) clear academic plan and pathway, 4) engaged learning, and 5) academic and social support network. Each of these was measured using a series of questions in the pretest and posttest survey questionnaires.

**Dependent variable 1 – early connections.** This refers to the degree to which the students make meaningful connections early in their college experience. “When students describe their early college experiences, they typically reflect on occasions when they felt discouraged or thought about dropping out. Their reasons for persisting almost always include one common element: a strong, early connection to someone at the college” (NOVA, 2016, p. 5). Establishing connections early helps the new student to feel like he or she belongs in college. The research literature confirms that students who make connections and develop a strong sense of belonging are more motivated to practice habits that lead to academic success and to be retained (Ribera, Miller, & Dumford, 2017; Strayhorn, 2012; Walton & Cohen, 2011; 2007).

It is critical to the success of first-year students that they develop a sense of social belonging by making connections to others in the college environment early in their college experience. “Belonging uncertainty” is a term used to describe the situation that arises when a new student worries that he or she does not belong and may fear that they will be devalued or excluded (PERTS, 2017). Belonging uncertainty affects how a student makes sense of his or her experiences in college (Walton & Cohen, 2007) and could have the deleterious effect of social and academic withdrawal which in turn threatens the student’s achievement and persistence. Social belonging is important for all students but the threat of belonging uncertainty or
stereotype threat might be more prominent among sub-categories of students who enter college with less college-related “cultural capital” (Davis, 2010, p. 206; Ward, Siegel, & Davenport, 2012, p. 7) than others, such as first generation students and socially stigmatized groups (Walton & Cohen, 2011).

The difference between the pretest and posttest scores for this variable provide insight into whether and to what degree the FYS promoted early connections. The survey questions used in the current study and associated with this benchmark are intended to give some measure of how well the FYS student has formed new relationships and developed connections with other students, support personnel (faculty and staff), and the institution (i.e. by joining clubs, etc.). There were four survey questions that were linked to making early connections.

(Q 12) To what extent do you feel like you belong at this college?

(Q 13) To what extent do you feel there is someone (such as a faculty, staff, administrator, librarian, tutor, etc.) who really knows you on an individual basis?

(Q 23) How often did you attend a campus organization or club meeting?

(Q 24) How often did you attend an EGSC sports event?

**Dependent variable 2 - high expectations and aspirations.** This outcome category is important for the FYS because if first-year students better understand what it takes to be successful and act on that understanding toward achievement when they perceive clear, high expectations from college staff and faculty as soon as they enter college (Center for Community College Student Engagement, 2016). This outcome may be especially important for first-generation students. According to a publication by the U.S. Department of Education, National Center for Education Statistics (Choy, 2001) having parents who did not attend college was correlated with “lower educational expectations than their peers” (2001, p. 10), and lower
likelihood of remaining on a “persistence track to a bachelor’s degree” (p. 25). “When entering
students perceive clear, high expectations from college staff and faculty, they are more likely to
understand what it takes to be successful and adopt behaviors that lead to achievement”
(CCCSE, 2018, p. 1). There were eight survey questions that were linked to high expectations.

(Q 10) To what extent do you believe that your instructors want you to succeed in
college?

(Q 11) To what extent are you confident that you will graduate from college?

(Q 16) How often did you turn in an assignment late for any of your classes?

(Q 17) How often did you come to any of your classes without completing the readings or
assignments before class?

(Q 18) How often did you refer to the syllabus for any of your classes?

(Q 19) How often did you take notes in any of your classes?

(Q 20) How often did you make a list of the tasks you need to do to study for any of your
classes?

(Q 26) How often did you arrive late to any of your classes?

**Dependent variable 3 - clear academic plan and pathway.** The Center for Community
College Student Engagement (2018) explained this benchmark as important for the SENSE study
because “Students are more likely to persist if they not only are advised about what courses to
take, but also are helped to set academic goals and to create a plan for achieving them” (p. 1).
This benchmark was also consistent with the Pathways Model developed by the American
Association of Community Colleges. They have asserted that “College students are more likely
to complete a degree in a timely fashion if they choose a program and develop an academic plan
early on, have a clear road map of the courses they need to take to complete a credential, and
receive guidance and support to help them stay on the path” (American Association of Community Colleges, 2018, p. 1). The cluster of questions for this outcome focus on the students’ sense of purpose for attending college (in terms of major), knowledge of course requirements, and level of intentional planning for graduation. There were three survey questions that were linked to clear academic plan and pathway.

(Q 6 & Q 7) Have you selected a major?

(Q 8) Do you know what classes you need to take from this semester until you graduate?

(Q 9) Have you created a written graduation plan in which you listed all of the classes you need to graduate?

**Dependent variable 4 - engaged learning.** “Instructional approaches that foster engaged learning are critical for student success” (CCCSE, 2018, p. 2). Engaged learning has been defined as “when students participate in educational environments that encourage them to increase the time and effort they focus on learning and development through interactions with faculty, staff, and other students. In other words, students who regularly participate in educationally purposeful activities are engaged” (Cottrell, 2016, p. 36). The survey questions used in the current study and associated with this benchmark address some of the purposeful activities that are intentionally encouraged by the FYS. For example, the SOAR method is a metacognitive strategy proven by research to be very effective that is included in the course content. It is almost always the case that the students in the FYS have never encountered the SOAR strategy before taking the course so the question about SOAR is valuable as an assessment of how many students adopt the strategies promoted in the course. There were seven survey questions that were linked to engaged learning.

(Q 14) How often did you participate in a study group outside any of your classes?
(Q 15) How often did you discuss any assignment or grade with any instructor?

(Q 21) How often did you ask any of your professors for help?

(Q 22) How often did you use the SOAR technique to study for any of your classes?

(Q 29) How often did you answer a professor’s question in any of your classes?

(Q 30) How often did you ask the professor a question in any of your classes?

(Q 31) How often did you participate in any learning opportunities on campus

(Convocation, special speakers, etc.)?

**Dependent variable 5 - Academic and social support network.** Colleges must intentionally provide academic and social support for students, especially new students, because “entering students often don’t know what they don’t know” (CCCSE, 2018, p. 2). Beyond helping students make connections to create a sense of belonging for them at college, institutions need to help students connect to people and resources on campus that offer them academic and other support. Colleges must purposefully create support networks because students often don’t know what they don’t know (Center for Community College Student Engagement, 2009). The questions in this outcome category measure how often students accessed help from a campus resource office or people on campus. There were three survey questions that were linked to academic and social support.

(Q 25) How often did you get tutoring help or other assistance from the ACE?

(Q 27) How often did you get help from any professor during office hours?

(Q 28) How often did you study in a group outside of class time?

**Data Analysis**

Several types of analysis were conducted to evaluate the data in this experiment. Parametric statistics were appropriate for this study because it was an experiment with true
randomization in which the sample was the population rather than a subset thereof. The sample size was also sufficient for parametric analysis.

Descriptive statistics were used to describe the population of student participants in the study. Each question in the pretest/posttest was treated as a separate variable. Frequency measures of central tendency were calculated for each. Paired t-test analysis was used to measure differences between the pretest and posttest for each group. Independent t-test analysis was conducted to determine differences between each class size group. Findings are reported in chapter four.

**Description of the Population**

Descriptive statistics were calculated to describe the population. Demographic variables included age, sex, race, first-generation status, academic major, residential status, learning support status, employment status, non-academic responsibility, campus involvement, credit hours attempted, credit hours earned, and FYS grade.

**Univariate Analysis**

Frequencies and measures of central tendency were calculated for each question variable in the pretest and posttest. The findings were organized in relation to the five dependent variable categories.

**Examining Change**

Paired t-test analyses were conducted for each variable in each class size condition to determine if there was a statistically significant difference between the pretest scores and the posttest scores for students in the class. The percent of change between pretest and posttest was also determined.
Independent t-test analyses were conducted to determine if there was a statistically significant difference between the percent of change in the small class condition from the percent of change in the large class condition for each question variable.

**Consistency of Questions**

Cronbach’s alpha was calculated for the group of questions associated with each of the five dependent variables to assess the extent to which the questions were a consistent measure of the concept. In other words, the percent of the variance in the scores that was reliable. The cases where the scale had a reasonably strong alpha coefficient were considered to reliably tap into an underlying construct of the dependent variable. Questions that did not prove to represent the dependent variable were omitted or considered as separate dependent variables for the study.

**Examining Differences Between Conditions for Each Category Variable**

The mean scores for each dependent variable category, that were derived from the group of questions that addressed the category, were compared between the two conditions using an independent t test analysis. The purpose was to determine if a statistically significant difference existed between the small and large class conditions and to identify the direction of the difference.

**Protection of Participants**

The data collection procedures were approved by the institutional review boards (IRB) for Kennesaw State University and for the study institution. This was done to ensure that minimal or no risk was extended to the participants in the study and that the participants gave their informed consent.

Each of the questionnaires used in this study began with an introduction which identified the study as KSU IRB Study #18-399, explained the purpose of the study, described the use of
the data as anonymous (participant names removed) and reported only in aggregate form,
explained that completion of the survey constituted consent, and clarified that the participant
may opt out of the survey completely or opt out of any individual question in the survey if they
wish. The option of opting out of the survey was built in the survey via question three. Question
three asked, “Do you agree to complete this survey?” and offers the following answer options:
“Yes. If you check yes, you proceed to the next question (#4) on the next screen” or “No. If you
check no, the survey ends here. Click “Done” to exit the survey.”

The respondent’s name was collected on the questionnaire so that it could be used as a
key variable to match the content from the pretest to the posttest. However, once the two
databases were merged, the names and any other student identifiers (such as student ID) were
deleted rendering the study and any archived data truly anonymous.

This chapter described the methodology used to conduct this research including the
descriptions of the setting, participants, procedures for random assignment, data collection
instruments, data collection procedures, data analysis, and the procedures used for the protection
of human subjects. The next chapter presents the findings of the study.
CHAPTER 4: RESULTS

The purpose of the study was to examine the relationship between first-year seminar (FYS) class size and five selected student engagement outcome categories in addition to retention, as measured by enrollment the following semester. This chapter presents a description of the participants and the findings for this study in relation to the hypotheses. Descriptive and inferential statistics were used to analyze the data, using SPSS for Windows Release 25.0. The chapter begins with a description of the participants, including the demographic makeup of the sample. The findings for the pretest and posttest questions and analysis of institutional retention data are organized under the dependent variable categories: 1) early connections, 2) high expectations and aspirations, 3) clear academic plan and pathway, 4) engaged learning, 5) academic and social support network, and 6) retention.

Participants

Descriptive statistics (frequencies, percentages, means, and standard deviations) were calculated to describe the participants in the study. There were a total of 135 student participants enrolled in the FYS. All new students were automatically enrolled in a single section of the FYS. Then on the first day of classes, these students were randomly assigned to FYS sections of two size conditions, large (one section of 85 students) and small (three sections of 15 students). The sample was stratified first by sex and then by learning support status such that the ratio of male to female and learning support to non-learning support status remained consistent. This consistency was distorted somewhat after attrition. The students were then given the details (meeting days, times, and rooms) for their new schedule on the first day of classes and reported to their assigned sections for subsequent class sessions. After attrition (those who were dropped for non-payment or otherwise withdrew) the total sample size was 114 students with 76 (66.7%)
in the large condition and three sections with 15 (13.2%), 13 (11.4%), and 10 (8.8%) students for a total of 38 (33.4%) in the small condition.

**Sex, Race, and Age**

Among all participants, there were 55 (48.2%) males and 59 (51.8%) females. Disaggregated by class size, there were 33 (60.0%) males in the large class condition and 22 (40.0%) in the small class condition. Nearly three-quarters of the females (43, 72.9%) were in the large class size condition and 16 (27.1%) females were in the small class size condition. The ratio of males to females was smaller for the large condition (0.7272:1) and larger for the small class condition (1.3030:1). The distribution of students by sex for the all new entering students, including those from the main campus who participated in this study and new students on the two satellite campus venues was nearly an even split with 51% female and 49% male.

Data indicating race was collected from institutional records and reflects the race the student indicated on their application for college. The majority (64, 56.1%) of participants identified as Black or African American, 41 (36%) were White, and the remaining nine students identified as multiracial (5, 4.4%), Asian (1, 0.9%), Native American or Alaskan Native (1, 0.9%), Native Hawaiian or Pacific Islander (1, 0.9%), and race not reported (1, 0.9%). The distribution of new entering students by race for the entire institution was similar with 50% identifying as Black and 40% identifying as White.

Most of the participants in this study fit the category of traditional college student defined as “financially dependent, 18- to 21-year-old high school graduates who enroll full time” (Chao, 2007, p. 2). The age range of respondents was 18-55 but 82.7% of them were under 22 years old, 97.6% were under age 30, and only three students were older than 30 (ages 31, 43, and 55). This study was conducted only for students on the main campus but the distribution of students by age
was similar for the all three campuses (Swainsboro, Statesboro, and Augusta) combined (98% under age 30 and 78% under age 22).

**First-Generation Status**

Survey #1 collected demographic information about student participants, such as first-generation college student (FGCS) status, that was not otherwise available through institutional records. Multiple definitions of first-generation status have been employed in the research literature (Toutkoushian, Stollberg, & Slaton, 2018). Definitions range from students whose parents or guardians have no education beyond high school to students whose parents or guardians have not obtained a four-year college degree (Ward, Siegel, & Davenport, 2012). Data collected about the participants in this study allowed for disaggregation by several levels or types of first-generation status.

**Statistical Analysis of Dependent Variables**

There were six dependent variables that were analyzed for this study. Five of them correspond to engagement outcomes used for the SENSE study (NOVA, 2016): 1) early connections, 2) high expectations and aspirations, 3) clear academic plan and pathway, 4) engaged learning, and 5) academic and social support network. The sixth variable was next semester retention.

**Analysis of Early Connections**

A nine-question scale was developed to measure student behaviors that promote early connections with faculty and other students in academic and social contexts. The questions on the SENSE instrument (NOVA, 2016), items listed in the research literature for 11 studies of social belonging (Ribera, Miller, & Dumford, 2017) and opportunities for support or engagement
known to be available to student participants influenced the inclusion of specific items in the scale. These questions, included in the pretest and posttest surveys, were as follows.

- Question 14 - How often did you participate in a study group outside any of your classes?
- Question 15 - how often did you discuss any assignment or grade with any instructor?
- Question 21 – How often did you ask any of your professors for help?
- Question 23 – How often did you attend a campus organization or club meeting?
- Question 24 – How often did you attend EGSC sports events?
- Question 25 – How often did you get tutoring help or other assistance from the ACE?
- Question 27 - How often did you get help from any professor during office hours?
- Question 28 – How often did you study in a group outside of class time?
- Question 31 – How often did you participate in any learning opportunities on campus (such as Convocation, special speakers on campus, etc.)?

Respondents answered these questions by imputing a numeric value between 0 and 100 to indicate “how often” they had participated in the various types of activities that support making connections in the prior two weeks.

**Internal reliability and composite variable.** The Cronbach Alpha for these nine items in the pretest ($\alpha=.826$) and in the posttest ($\alpha=.838$) reached conventional standards for scale reliability. Based on this finding a composite variable, “connections composite,” was computed for the pretest and posttest under both class size conditions.
Making connections. A paired samples t test was conducted to determine if the pretest and posttest connections composite scores were different for each class size condition. Students in the large class size condition reported statistically significantly higher levels of behaviors that promote early connections (connections composite scores) from pretest ($M = 28.8472$, $SD = 20.7907$) to posttest ($M = 35.9699$, $SD = 21.6444$), $t(47) = 3.157$, $p = .003$. Connections composite scores between the pretest ($M = 36.1358$, $SD = 21.4111$) and the posttest ($M = 31.5802$, $SD = 20.6498$) by students in the small class size condition did not differ significantly $t(26) = 1.812$, $p = .082$.

Connections gain. The variable “connections gain” (connections gain = connections composite posttest – connections composite pretest) was computed to represent the difference between the levels of behaviors that promote early connections reported on the pretest and behaviors that promote early connections on the posttest. The connections gain variable was then used to evaluate the difference experienced by students in the large class size compared to students in the small class size.

An independent-samples t-test was conducted to compare connections gain in the large class size and the small class size conditions. There was a significant difference in the connections gain scores for the large class size ($M=7.1227$, $SD=15.6301$) and the small class size ($M=4.5556$, $SD=13.0654$) conditions; $t(73)=3.287$, $p = .002$. Connections gain (student behaviors that promote early connections) was higher for students in the large class size with a mean difference of 11.6782.

Analysis of High Expectations and Aspirations

Two questions were developed to measure student expectations and aspirations. These questions, included in the pretest and posttest surveys, were as follows.
• Question 10 - To what extent do you agree or disagree with this statement: I believe my instructors want me to succeed in college?

• Question 11 - To what extent do you agree or disagree with this statement: I am confident that I will graduate from college?

Respondents answered these questions by imputing a numeric value between 0 and 100 to indicate the extent that they agreed with the statement. The response indicated the student’s disposition in the two weeks prior to the administration of the survey.

**Internal reliability and composite variable.** The Cronbach Alpha for these two items in the pretest ($\alpha=.088$) and in the posttest ($\alpha=.646$) did not reach the standard for scale reliability. Based on this finding, a composite variable was not computed. Instead each question was examined separately.

**Perceptions of Instructor Disposition**

Question 10 addresses the student’s perception of the instructor’s disposition toward the student. If students believe that the instructor wants them to succeed, then they are furnished with validation for their self-efficacy. Perception that the instructor wanted them to succeed was high on both the pretest ($M=85.56, SD=18.895$) and the posttest ($M=83.16, SD=21.148$) for the total population of students ($N = 87$ and $90$ respectively). The mode was 100 for both the pre and post measures. A paired samples $t$ test of the pretest ($M = 86.03, SD = 18.391$) and posttest ($M = 82.23, SD = 21.906$) means for question 10 revealed that they were not significantly different, $t(74) = 1.480, p = .143$.

When disaggregated by class size condition, the student’s perception of the instructor’s disposition between the pretest and the posttest was not statistically different for students in the large class condition but was significantly different for students in the small class condition.
For each class size condition, a paired samples $t$ test was conducted to determine if the pretest and posttest perception of instructor disposition mean scores were different. The perception of disposition means between the pretest ($M = 85.35, SD = 19.191$) and the posttest ($M = 83.31, SD = 18.695$) by students in the large class size condition did not differ significantly, $t(47) = .617, p = .541$. The paired samples $t$ test revealed no statistically significant difference in perception of instruction disposition for students in the small class size condition between the pretest ($M = 87.22, SD = 17.165$) and the posttest ($M = 80.30, SD = 26.981$), $t(26) = 1.717, p = .098$.

**Instructor disposition gain.** The variable “instructor disposition gain” (instructor disposition gain = instructor disposition post – instructor disposition pre) was computed to represent the difference (gain) between perception of instructor disposition reported on the pretest and on the posttest. The gain variable was then used to evaluate the difference in perception of instructor disposition by students in the large class size compared to students in the small class size.

An independent-samples t-test was conducted to compare instructor disposition gain in the large class size and the small class size conditions. There was no significant difference in the instructor disposition gain mean scores for the large class size ($M=-2.041, SD=22.9439$) and the small class size ($M=-6.9259, SD=20.9577$) conditions; $t(73)=.912, p = .365$.

**Analysis of Self-Efficacy**

Question 11 addresses the student’s level of confidence that they will graduate. Although confidence in their ability to complete may be considered a type of self-efficacy, this single question was not intended as a conclusive measure of self-efficacy since no formal self-efficacy scale was administered. Respondent confidence toward graduation was high on both the pretest
(\(M=90.37, SD=17.138\)) and the posttest (\(M=82.00, SD=23.405\)) for the total population of students (\(N = 87 \text{ and } 90 \) respectively). The mode was 100 for both the pre and post measures. A paired samples \(t\) test of the pretest (\(M = 90.92, SD = 17.005\)) and posttest (\(M = 82.27, SD = 23.811\)) means for graduation confidence revealed that they were significantly different, \(t(74) = 2.898, p = .005\). For the total population of participants, there was a decrease in graduation confidence between the administration of the pretest (week 3) and the administration of the posttest (week 13).

When disaggregated by class size condition, the student’s level of confidence that he or she would graduate between the pretest and the posttest was found to be statistically significantly different for both the large class condition and the small class condition. Under both conditions the level of confidence decreased between the pretest and the posttest administrations.

The level of confidence differed significantly, \(t(47) = 2.067, p = .004\), between the pretest (\(M = 90.40, SD = 16.872\)) and the posttest (\(M = 83.40, SD = 23.922\)) for students in the large class size condition. The paired samples \(t\) test also revealed a statistically significant difference in level of confidence for students in the small class size condition between the pretest (\(M = 91.85, SD = 17.521\)) and the posttest (\(M = 80.26, SD = 23.932\)), \(t(26) = 2.015, p = .054\).

**Level of graduation confidence gain.** The variable “graduation confidence gain” (level of confidence gain = level of confidence post – level of confidence pre) was computed to represent the difference (gain or loss) between level of graduation confidence reported on the pretest and on the posttest. The gain variable was then used to evaluate the difference in level of graduation confidence by students in the large class size compared to students in the small class size.
An independent-samples t-test was conducted to compare graduation confidence gain in the large class size and the small class size conditions. There was no significant difference in the instructor disposition gain mean scores for the large class size ($M=-7.0000$, $SD=23.4620$) and the small class size ($M=-11.5926$, $SD=29.9001$) conditions; $t(73)=.736$, $p = .464$.

**Analysis of Clear Academic Plan and Pathway**

Descriptive statistics were used to analyze three dichotomous variables (values = Yes or no) associated with the development of a clear academic plan and /or pathway. Participant responses were observed for the following three questions that were included in the pretest and the posttest questionnaires. Question six addressed whether the participants had selected a major by the time of the administration of each survey. Question eight addressed the student’s self-reported knowledge of the Core requirements for graduation. Question nine addressed the student’s intentionality with regard to planning for graduation.

- **Question 6.** – Have you selected a major?
- **Question 8.** – Do you know what classes you need to take from this semester until you graduate?
- **Question 9.** – Have you created a written graduation plan in which you listed all of the classes you need to graduate?

**Academic Major Identification**

About three-quarters of all participants answered the question, 87 (76.3%) on the pretest and 90 (78.9%) on the posttest. At the time the pretest was administered, there was a higher percentage of students in the small class size condition who had selected a major (73.7%) compared to students in the large class size condition (62.3%). The percent of students who had
selected a major by the time of the administration of the posttest was about the same for the small class size condition (60.5%) and the large class size condition (59.6%).

**Knowledge of the Core**

Participants were asked to report whether or not they know which courses they need to graduate. Since the majority of the students are completing the first two years of a four-year liberal arts degree at this institution, the courses referenced in the question were the common Core questions used in the university system. A higher percent of students in the small class size condition (84.2%) answered the question on the pretest than did the students in the large class size condition (72.4%). The percent of students who answered the question on the posttest was about the same for both size conditions (78.9%).

An increase in the percent of students who indicated that they know which classes they need to graduate was observed for both class size conditions, but the increase was greater for the small class size condition. Knowledge of the Core increased for the large class from 74.5% at the time of the pretest to 83.3% at the time of the posttest. The increase for the small class size condition was from 78.1% at the time of the pretest to 90% at the time of the posttest.

**Graduation Planning**

Students were asked to report whether or not they had created a written graduation plan. This was an assignment in the course but not all students completed the assignment. About three-quarters of the participants answered the question on both the pretest and the posttest (76.3% and 78.9% respectively). The valid percent of students who had completed a written graduation plan increased by 12.7 percent from 47.3 percent on the pretest to 60 percent on the posttest. There was a larger increase (26.1%) between the pretest (40.6%) and posttest (66.7%) for the small class size condition.
Chi Square Analysis

Since the goal of the FYS regarding major selection, knowledge of the core curriculum, and written graduation planning was that students would complete those tasks by the end of the course, the chi square analysis was limited to the posttest results for those variables.

**Academic major selection.** A chi-square test of independence was performed to examine the relation between class size condition and academic major identification. The relation between these variables was not significant, $\chi^2 (1, N = 90) = .030, p <.862$. The percentage of participants that had selected a major by the administration of the posttest was not different by class size condition.

**Knowledge of the core curriculum.** A chi-square test of independence was performed to examine the relation between class size condition and academic major identification. The relation between these variables was not significant, $\chi^2 (1, N = 90) = .719, p <.396$. The percentage of participants that reported knowledge of the core curriculum by the administration of the posttest was not different by class size condition.

**Written graduation plan.** A chi-square test of independence was performed to examine the relation between class size condition and academic major identification. The relation between these variables was not significant, $\chi^2 (1, N = 90) = .378, p <.539$. The percentage of participants that had created a written graduation plan by the administration of the posttest was not different by class size condition.

**Analysis of Engaged Learning**

Two types of student behaviors were analyzed to understand the level of engaged learning. These were behaviors that promote engagement (engagement behaviors) and behaviors that undermine engagement (disengagement behaviors). Respondents answered questions about
these behaviors by imputing a numeric value between 0 and 100 to indicate “how often” they had engaged in the various types of engagement or disengagement behavior in the prior two weeks.

**Engagement**

An eight-question scale was developed to measure student engagement behaviors. The questions were included in the pretest and posttest surveys. There were three questions that assessed in-class engagement (questions 19, 29, and 30) behaviors and five questions that addressed out-of-class engagement behaviors (questions 15, 18, 20, 21, and 22). The questions were as follows.

- Question 19. - How often did you take notes in any of your classes?
- Question 29. - How often did you answer a professor's question in any of your classes?
- Question 30. - How often did you ask the professor a question in any of your classes?
- Question 15. - How often did you discuss any assignment or grade with any instructor?
- Question 18. - How often did you refer to the syllabus for any of your classes?
- Question 20. - How often did you make a list of the tasks you need to do to study for any of your classes?
- Question 21. - How often did you ask any of your professors for help?
- Question 22. - How often did you use the SOAR technique to study for any of your classes?
Disengagement

A three-question scale was developed to measure student disengagement behaviors. The questions were as follows.

- Question 16. - How often did you turn in an assignment late for any of your classes?
- Question 17 - How often did you come to any of your classes without completing the readings or assignments before class?
- Question 26. - How often did you arrive late to any of your classes?

Internal Reliability and Composite Variable

The Cronbach Alpha for the eight questions in the pretest ($\alpha = .741$) and in the posttest ($\alpha = .789$) reached conventional standards for scale reliability. Based on this finding a composite variable, “composite engagement,” was computed for the pretest and posttest under both class size conditions. Cronbach Alpha revealed that the three disengagement questions also reached the conventional standard for scale reliability on both the pretest ($\alpha = .706$) and the posttest ($\alpha = .841$). Based on these findings, the variables, “composite engagement” and “composite disengagement.” were computed for the pretest and posttest under both class size conditions.

Composite engagement. A paired samples $t$ test was conducted to determine if the pretest and posttest composite engagement scores were different for each class size condition. Students in the large class size condition reported significantly higher composite engagement from pretest ($M = 54.3464, SD = 18.7226$) to posttest ($M = 60.9089, SD = 18.9777$), $t(47) = 2.554, p = .014$. The composite engagement scores between the pretest ($M = 60.6898, SD = 18.1324$) and the posttest ($M = 52.6389, SD = 21.7109$) by students in the small class size condition did not differ significantly $t(26) = 1.828, p = .079$. 
**Composite disengagement.** A paired samples *t* test was conducted to determine if the pretest and posttest composite disengagement scores were different for each class size condition. Students in the large class size condition reported significantly higher composite disengagement from pretest (*M* = 16.1944, *SD* = 19.0599) to posttest (*M* = 26.666, *SD* = 27.4171), *t*(47) = 2.893, *p* = .006. The composite disengagement between the pretest (*M* = 17.5802, *SD* = 18.6482) and the posttest (*M* = 24.0988, *SD* = 21.14759) by students in the small class size condition did not differ significantly *t*(26) = 1.592, *p* = .124.

**Engagement gain.** The variable “engagement gain” (engagement gain = composite engagement post – composite engagement pre) was computed to represent the difference (gain) between engagement reported on the pretest and engagement reported on the posttest. The gain variable was then used to evaluate the difference in levels of engagement by students in the large class size compared to students in the small class size.

An independent-samples *t*-test was conducted to compare engagement gain in the large class size and the small class size conditions. There was a significant difference in the engagement gain scores for the large class size (*M*=6.5625, *SD*=17.7994) and the small class size (*M*=8.0509, *SD*=22.8824) conditions; *t*(73)=3.074, *p* = .003. The increase in engagement between the pretest and posttest measures was higher for students in the large class size with a mean difference of 14.6134.

**Disengagement gain.** The variable “disengagement gain” (disengagement gain = composite disengagement post – composite disengagement pre) was computed to represent the difference (gain) between use of support reported on the pretest and use of support reported on the posttest. The gain variable was then used to evaluate the difference in levels of engagement by students in the large class size compared to students in the small class size.
An independent-samples t-test was conducted to compare disengagement gain in the large class size and the small class size conditions. The disengagement gain scores for the large class size ($M=10.4722, SD=25.0756$) and the small class size ($M=6.5185, SD=21.2784$) conditions; $t(73)=-.691, p = .492$ were not statistically different.

**Analysis of Academic Support Network**

A three-question scale was developed to measure student experience with academic support. These questions, included in the pretest and posttest surveys, were as follows.

- **Question 21** - How often did you ask any of your professors for help?
- **Question 25**. - How often did you get tutoring help or other assistance from the ACE?
- **Question 27**. - How often did you get help from any professor during office hours?

Respondents answered these questions by imputing a numeric value between 0 and 100 to indicate “how often” they had used the various types of academic support in the prior two weeks.

**Internal reliability and composite variable**

The Cronbach Alpha for these three items in the pretest ($\alpha=.798$) and in the posttest ($\alpha=.731$) reached conventional standards for scale reliability. Based on this finding a composite variable, “composite support,” was computed for the pretest and posttest under both class size conditions.

**Use of support**

A paired samples $t$ test was conducted to determine if the pretest and posttest composite support scores were different for each class size condition. Students in the large class size
condition reported significantly higher use of academic support (composite support scores) from pretest ($M = 30.6667, SD = 24.6104$) to posttest ($M = 40.6806, SD = 27.8261$), $t(47) = 3.125, p = .003$. The use of academic support between the pretest ($M = 39.2593, SD = 28.4423$) and the posttest ($M = 36.4983, SD = 22.2753$) by students in the small class size condition did not differ significantly, $t(26) = .606, p = .550$.

**Support gain**

The variable “support gain” (support gain = composite support post – composite support pre) was computed to represent the difference (gain) between use of support reported on the pretest and use of support reported on the posttest. The gain variable was then used to evaluate the difference in gain experienced by students in the large class size compared to students in the small class size.

An independent-samples t-test was conducted to compare support gain in the large class size and the small class size conditions. There was a significant difference in the support gain scores for the large class size ($M=10.0139, SD=22.1984$) and the small class size ($M=2.7654, SD=23.7041$) conditions; $t(73)=2.335, p = .022$. Support gain (student use of academic support) was higher for students in the large class size with a mean difference of 12.7793.

The results were that the support gain score for X (stats) was higher/lower/not different from the support gain score for Y (stats) t-stats.

**Analysis of Next Semester Retention**

This study was conducted for participants who were enrolled in the FYS for spring 2018. During that term the students were enrolled in 12.91 credit hours on average ($SD=2.106$) with a mode of 12 credit hours and a median of 13 credit hours. Of the 114 participants, 94 (82.5%) were enrolled for a full-time load (12 or more credit hours) and more than one-fifth (20.2%) of
the students carried the standard load needed to graduate on time if attending only fall and spring semesters (15 or more credit hours).

About one-third (36 students or 31.6%) returned for the summer 2018 term. There were 70 students (61.4%) who returned for the fall 2018 semester. Of the 70 students who returned for fall 65 (92.8%) were enrolled for a full-time load (12 or more credit hours) and nearly half (34 students or 49%) carried 15 or more credit hours.

**Retention of Students in the Large Class Condition**

More than one-third (29 students or 38.2%) of students in the large class size condition (n=76) returned for the summer 2018 term and nearly two-thirds (48 students or 63.2%) were retained for the fall 2018 semester. Of the 48 students who returned for fall, 43 (90%) were enrolled for a full-time load (12 or more credit hours) and more than one-third (17 students or 35%) carried 15 or more credit hours.

**Retention of Students in the Small Class Condition**

Seven students (18.4%) in the small class size condition (n=38) returned for the summer 2018 term and more than half (22 students or 57.9%) were retained for the fall 2018 semester. All (100%) of the 22 students who returned for fall were enrolled for a full-time load (12 or more credit hours) and more than one-fourth (6 students or 27%) carried 15 or more credit hours.

**Chi Square Analysis**

A chi-square test of independence was performed to examine the relation between class size condition and next semester retention. The relation between these variables was not significant, \( \chi^2 (1, N = 114) = .296, p <.586 \). The percentage of participants that were enrolled for the next semester was not different by class size condition.
Summary of the Hypotheses Testing

There were six hypotheses designed to address the research question: What is the effect of class size for a first-year seminar on next semester persistence and on five engagement outcomes taken from the SENSE study: 1) early connections, 2) high expectations and aspirations, 3) clear academic plan and pathway, 4) engaged learning, and 5) academic and social support network. The hypotheses were as follows.

- **H₁**: Students in the small class condition will score higher on the early connections questions than will students in the large class condition.

- **H₂**: Students in the small class condition will score higher on the high expectations and aspirations questions than will students in the large class condition.

- **H₃**: Students in the small class condition will score higher on the clear academic plan and pathway questions than will students in the large class condition.

- **H₄**: Students in the small class condition will score higher on the engaged learning questions than will students in the large class condition.

- **H₅**: Students in the small class condition will score higher on the academic and social support network questions than will students in the large class condition.

- **H₆**: Students in the small class condition will be retained from spring to fall semester at a higher rate than will students in the large class condition.

Analysis of Hypothesis One

The hypothesis that students in the small class condition will score higher on the early connections questions than will students in the large class condition was not supported. An independent-samples t-test that was used to compare a composite variable representing the nine
questions associated with early connections for students in the large class size and the small class size conditions revealed that student behaviors that promote early connections were higher for students in the large class size with a mean difference of 11.6782.

**Analysis of Hypothesis Two**

The hypothesis that students in the small class condition will score higher on the high expectations and aspirations questions than will students in the large class condition was not supported. The two questions associated with student expectations and aspirations (perception of the instructor disposition and graduation confidence) were examined separately to test this hypothesis. The hypothesis was not supported with regard to beliefs about instructor disposition. There was no significant difference in the perceived instructor disposition for the large and small class size conditions. The hypothesis was not supported with regard to graduation confidence. An independent-samples t-test conducted to compare graduation confidence for the large class size and the small class size conditions revealed no statistically significant difference for the two conditions.

**Analysis of Hypothesis Three**

The hypothesis that students in the small class condition will score higher on the clear academic plan and pathway questions than will students in the large class condition was not supported. A chi-square test of independence was performed to examine the relation between class size condition and the three components of this dependent variable (academic major selection, knowledge of the core curriculum, and a written graduation plan). In all three cases the relation between class size and the dependent variable was not significant.
Analysis of Hypothesis Four

The hypothesis that students in the small class condition will score higher on the engaged learning questions than will students in the large class condition was not supported. Both behaviors that promote engagement (engagement behaviors) and behaviors that undermine engagement (disengagement behaviors) were examined using t test analysis to test this hypothesis.

An independent-samples t-test was conducted to compare changes in the level of engagement for the large class size and the small class size conditions. Although there was a significant difference between the large class size (M=6.5625, SD=17.7994) and the small class size (M=8.0509, SD=22.8824) conditions; t(73)=3.074, p = .003, it was students in the large class condition that experienced the greater increase in increase in engagement (with a mean difference of 14.6134).

Disengagement behaviors were also compared for the large and small class venues using an independent-samples t-test. The findings failed to support the hypothesis because disengagement was not statistically different between class size conditions.

Analysis of Hypothesis Five

This hypothesis states that students in the small class condition will score higher on the academic and social support network questions than will students in the large class condition. The hypothesis was not supported because an independent-samples t-test revealed that use of academic support was higher for students in the large class size condition.

Analysis of Hypothesis Six

The final hypothesis addressed the issue of next semester retention and stated that students in the small class condition will be retained from spring to fall semester at a higher rate
than will students in the large class condition. This hypothesis was not supported. A chi-square test of independence revealed that the relation between class size condition and next semester retention was not significant, $\chi^2 (1, N = 114) = .296, p < .586$. The percentage of participants that were enrolled for the next semester was not different by class size condition.

**Conclusion**

The main question driving this research was whether the number of students enrolled in a first-year seminar (FYS) section has an effect on engagement outcomes that are associated with overall student success. A pretest – posttest experimental design with random assignment was employed to determine if a difference in student success outcomes existed between the FYS in two class size conditions, large and small.

Statistical analyses were performed to test the six hypothesis that addressed different aspects of the research question. Paired samples and independent samples $t$ tests were employed to evaluate differences in scale level dependent variables over the two class size conditions. Chi square statistics were used to examine differences for the dichotomous variables. None of the six hypotheses were supported. In some cases, there was no statistically significant difference for the dependent variables under the small and large class conditions. However, in other cases a statistical difference did exist but, in a direction, different that the hypothesis stated. That is, the hypothesis portended higher mean scores for dependent variables under the small class size condition, but the analysis revealed the opposite; higher scores were found for the large class size condition.
CHAPTER 5: DISCUSSION

A summary of the study, discussion of the findings, the limitations of the study, and recommendations for further study are found in this chapter. The purpose of the study was to examine the relationship between first-year seminar (FYS) class size and five selected student engagement outcome categories plus next semester retention.

The first-year seminar is a critical initiative for many institutions in promoting student engagement, retention, and student success in general. Class size is an economic issue as well as an academic one. The larger the number of students in a class, the less financial resources the institution needs to invest in educating the students; however, according to some studies (Bedar & Kuhn, 2008; Benton & Pallett, 2013; McKeachie, 1990) increasing class size may negatively affect the impact of the FYS on key outcome variables.

Summary of the Study

The purpose of the study was to analyze the effects of class size on engagement outcomes for a first-year seminar (FYS). The primary research question was whether the number of students in a FYS impacts engagement outcomes that are associated with overall student success. Class size was defined as small (less than 16 students) or large (85 students). The six engagement categories (dependent variables) analyzed were 1) early connections, 2) high expectations and aspirations, 3) clear academic plan and pathway, 4) engaged learning, 5) academic and social support network, and 6) next semester retention. The first five of these were drawn from the benchmarks previously determined to correlate with student success and used for a national study of student engagement, the Survey of Entering Student Engagement (SENSE), conducted by the Center for Community College Engagement (CCCSE, 2018).
Six hypotheses were developed to examine the research question within the context of each dependent variable.

**Hypotheses**

The hypotheses were as follows.

**H₁** Students in the small class condition will score higher on the early connections questions than will students in the large class condition.

**H₂** Students in the small class condition will score higher on the high expectations and aspirations questions than will students in the large class condition.

**H₃** Students in the small class condition will score higher on the clear academic plan and pathway questions than will students in the large class condition.

**H₄** Students in the small class condition will score higher on the engaged learning questions than will students in the large class condition.

**H₅** Students in the small class condition will score higher on the academic and social support network questions than will students in the large class condition.

**H₆** Students in the small class condition will be retained from spring to fall semester at a higher rate than will students in the large class condition.

**Instruments and Analysis**

A pretest–posttest experimental design with random assignment was employed to determine if a difference in student success outcomes existed between the FYS in two class size conditions, large and small. Data used to examine the hypotheses were collected from institutional records and three surveys: a demographic survey, a pretest survey, and a posttest survey (Appendices B, C). The pretest, administered during week three of the semester, and the posttest, administered during week 14 of the semester, included categories of questions aimed at
each of the five engagement constructs. These were presented with the intent to measure the difference (labeled “gain” and operationalized as posttest score minus pretest score in this study) between student attitudes and behaviors from the beginning to the end of the semester. This was achieved by performing paired t-test analyses. An independent samples t-test was performed to determine if a statistical difference existed between students in the large class size condition compared to the small class size condition for each ratio level outcome variable construct. Chi square analyses were performed to measure the difference between the large and small class size conditions for the constructs that used dichotomous variables: clear academic plan and pathway and next semester retention. All statistical analyses were performed using SPSS for Windows Release 25.0.

**Discussion of the Findings**

The findings presented in chapter four are discussed in relation to the reviewed literature and the hypotheses for this study.

**Reliability Analysis of the Survey Instrument**

An analysis of the survey instruments was conducted using Cronbach alpha coefficients. The results indicated that the instrument had mixed levels of internal consistency. The alpha ranged from .706 to .841 for three of the constructs which used ratio level data and reached conventional standards for scale reliability: early connections, engaged learning, and academic and social support network. The high expectations and aspirations construct did not reach conventional standards for scale reliability as a composite variable having an alpha range from .088 to .646. Since the high expectations and aspirations construct, measured using two survey questions (questions 10 and 11), yielded a low alpha, those questions were analyzed independently rather than as a composite. The questions are presented in Appendix C. The clear
academic plan and pathway construct and the next semester retention variable were not analyzed using Cronbach alpha since they were measured using dichotomous variables.

**Effect of Class Size on Early Connections**

Early connections were measured as a composite of nine related questions (pretest \( \alpha = .826 \), posttest \( \alpha = .838 \)). The findings in this study, using paired t-test analysis, indicated that students in the large class size condition experienced a significant increase in behaviors related to making connections. These behaviors included participating in a study group, discussing assignments or grades with professors, asking professors for help, visiting professors during office hours, getting help from the tutoring center, and attending a campus organization, club, sporting event, or special event on campus. In contrast, students in the small class condition did not experience a change in connection related behavior from the administration of the pretest (week 3) to the posttest (week 14). An independent samples t-test revealed that students in the large class condition experienced increases in connection related behaviors to a degree that was significantly greater than increases experienced by students in the small class condition.

The importance of behaviors leading to early connections was articulated by Light (1992) and others (Astin A. W., 1993; Kuh, Kinzie, Schuh, & Whitt, 2005; 2007; Sciarra, Seirup, & Sposato, 2016). The findings of the current study did not support the hypothesis (H1) that students in the small class condition would score higher on the early connections questions than students in the large class condition. Students in the small classes did not report making connections at higher rates than those in the large class; instead, the students in the large class condition reported making connections at higher rates. This result contradicts the expectation asserted by Allais that “face-to-face interaction is not incidental, but integral to the development of knowledge” (p. 727) and that such interaction both “requires low numbers, regardless of
whether the engagement between students and lecturers happens through email, chat rooms, discussion groups, or social media” (p. 732) and “is easily lost in a large group” (p. 730) class (Allais, 2013; 2014). However, the findings were consistent with the metanalysis study conducted by John Hattie (2015) who ranked small class size 129th in effect size out of 195 variables based on nearly 1200 meta-analysis.

One possible but unverified explanation for the higher rate of making connections behaviors by students in the large class might be because students in the large class felt a greater need to seek assistance outside of class. If students in the small classes experienced sufficient support and interactions with the professor and other students inside class, then they might be expected to seek assistance outside of class less often. The questions used to measure early connections were primarily about interactions that occur outside of the classroom in the professor’s office, at student organization meetings, in study groups, at the tutoring center, and campus event venues. If, as many researchers (Bligh, 2000; Cuseo, 2007; Monks & Schmidt, 2010; Prosser & Trigwell, 2014) have suggested, “most of the problems associated with large college and university classes that have been identified relate to the negative effects on student learning” (Mulryan-Kyne, 2010, p. 176), then students in large classes might be more likely to seek help outside of class. The findings concerning early connections in this study together with this explanation suggest that institutions that have large classes should promote high quality (especially those of an academic nature) interactions outside of class, especially faculty office hours (Smith, Chen, Berndtson, Burson, & Griffin, 2017).

**Effect of Class Size on High Expectations and Aspirations**

This variable, expectations and aspirations, is related to making connections in so far as affirming faculty-student connections and interactions lead to higher expectations and aspirations
for the student. Many researchers have reported that that high-quality student-faculty interactions are highly correlated with student retention, persistence, and academic achievement (Kuh, Kinzie, Schuh, & Whitt, 2005; Tinto, 1997). Student-faculty interactions are also correlated with the level of confidence the students have in their intellectual abilities and with student aspirations toward further study (Cole, 2007).

**Importance of expectations and confidence.** In most research studies, high expectations refers to the level of rigor incoming students anticipate will be the standard once they enter college. “Setting high expectations and communicating the steps needed to meet these standards is critical to helping students reach high levels of performance” (Gonyea, Kuh, Kinzie, Cruce, & Laird, 2006, p. 4). In considering the results from this study, it is important to note that the question used to measure expectations provides only an indirect measure of expectations as it has generally been defined in the research literature. In this study the expectations question is related to the faculty-student relationship and the way in which it might affect the student’s perception that their professors want them to succeed. The presumption was that if students believe that their instructors want (and by inference “expect”) them to succeed, then the students might express greater confidence that they will succeed (e.g. graduate). If this presumption holds, then the student’s perception of faculty expectations for them might result in increased (or decreased) academic effort on the part of the students as is consistent with the Thomas theorem (Thomas & Thomas, 1928) and the theory of self-fulfilling prophecy (Merton, 1948; 1968). The Thomas theorem states that if people define situations as real, they are then real in their consequences (Merton, 1968). Self-fulfilling prophecy, applied to the teaching and learning context, refers to the phenomena in which expectations of the teacher influence the performance of the student. Although Merton did not apply self-fulfilling prophecy to the education context in his original
work, numerous studies since then have confirmed the phenomena in the classroom setting (Rosenthal & Jacobson, 1968; Blease, 1983). However, the number and composition of the questions aimed at measuring expectations and aspirations in this study were not sufficient to fully address the variable and the potential ripple effects such as self-fulfilling prophecy.

Two pretest-posttest questions were used to address this variable: the first question (#10) addressed expectation, specifically by measuring the students’ perception that faculty want them to succeed, and the second question (#11) addressed aspirations, specifically by measuring the students’ level of confidence that they would graduate from college. These two questions were examined independently since the Cronbach alpha for the items did not reach the standard for scale reliability (pretest $\alpha=.088$ and posttest $\alpha=.646$).

**Expectations.** The perception of instructor disposition toward student success was evaluated for the total population (small and large class groups combined), for the large class separately, and for the small class size separately. On a scale of zero to 100, the mode was 100 and the mean was greater than 80 (range = 80.3 – 87.2) for all measurements. Perception that the instructor wanted them to succeed was not significantly different between the pretest and the posttest for the total population of students, for the students assigned to the large class size condition, or the students assigned to the small class size condition.

Statistical comparison of the large and small class conditions revealed no significant difference between the large and small classes with regard to student perception that faculty wanted them to succeed (expectation). An independent samples t-test revealed that the average change in perception of instructor disposition between the pretest and posttest for the large class ($M=-2.041$, $SD=22.9439$) was not significantly different from the average change between the pretest and posttest for the small class ($M=-6.9259$, $SD=20.9577$); $t(73)=.912$, $p = .365$. 
Self-efficacy. Self-efficacy expectations refer to “the conviction that one can successfully execute the behavior required to produce the outcomes” (Bandura, 1977, p. 193). This is important in the context of college student success because self-efficacy expectations influence the initiation of tasks or behaviors that lead to academic success, the amount of effort the student expends on the task, and the duration of the behavior in spite of obstacles (Bandura, 1977). This type of confidence might also encourage a student disposition of what Dweck and associates called “academic tenacity” referring to mindsets and skills that allow students to “look beyond short-term concerns to longer-term or higher-order goals, and withstand challenges and setbacks to persevere toward these goals” (Dweck, Walton, & Cohen, 2014, p. 4).

In this study the student’s self-efficacy, expressed as their level of confidence that they would graduate, was found to be significantly lower at the end of the semester than at the beginning of the semester for students in both the large class condition and the small class condition. The level of confidence dropped from a mean of 90.4 on the pretest to 83.4 (p=.004) on the posttest for the students in the large class and from a mean of 91.8 on the pretest to a mean of 80.3 (p=.054) on the posttest for the students in the small classes. However, there was no significant difference between the self-efficacy reported by the small group compared to those in the large group. An independent samples t test revealed that the average change in level of confidence between the pretest and posttest for the large class ($M=-7.0000, SD=23.4620$) was not significantly different from the average change between the pretest and posttest for the small class ($M=-11.5926, SD=29.9001$); $t(73)=.736, p = .464$.

Evaluation of the hypothesis. The hypothesis ($H_2$) that students in the small class condition would score higher on the high expectations and aspirations questions than would students in the large class condition was not supported. The students’ level of confidence did
change (was reduced) over the course of the semester but the findings of this study suggested that a difference in class size was not causal. Future research might examine the influence of other variables, such as changes in student perception of course difficulty, to better understand why the level of student confidence declined over time.

**Effect of Class Size on Clear Academic Plan and Pathway**

The degree to which the participants in the study had a clear academic plan and understanding of their pathway was assessed with regards to whether the student had selected an academic major, had knowledge of the core requirements for graduation, and had created a written graduation plan. These three items were measured using dichotomous (Yes or No) questions.

**Academic major identification.** Survey responses revealed that at the beginning of the semester (week three) when the pretest was administered, fewer students in the large class condition (62.3%) had selected a major than had students in the small class condition (73.7%). An examination of the frequencies suggested that this differentiation no longer existed at the end of the semester when the posttest was administered (week 14) since the percent of students reporting that they had selected an academic major was about the same for both the large (59.6%) and small (60.5%) class size conditions. The chi-square test of independence confirmed this observation revealing that the percentage of participants that had selected a major by the administration of the posttest was not different $\chi^2 (1, N = 90) = .030, p < .862$ by class size condition. Therefore, with regard to academic major identification, the hypothesis (H₃) that students in the small class condition will score higher on the clear academic plan and pathway questions than will students in the large class condition was not supported.
According to recent research, these findings may not undermine graduation rates. However, that so many (40%) of the students in this study report that they had not declared a major suggests that advisement assistance and career exploration experiences should be built into the first-year seminar or first year experience program. This is consistent with research suggesting that many students are not developmentally ready to select a major until the sophomore year (Freedman, 2013).

Conventional wisdom has been that students should select a major early and stick with it in order to reduce the time required to graduate. “College students are more likely to complete a degree in a timely fashion if they choose a program and develop an academic plan early on, have a clear road map of the courses they need to take to complete a credential, and receive guidance and support to help them stay on the path” (Bailey, Jaggars, & Jenkins, 2015, p. 1). In recent years that axiom has been modified a bit by a migration from major to meta-major. A meta-major is more general than a major; it is an umbrella for multiple majors that require the same or very similar courses.

Organizations that drive change in higher education, such as Complete College America, have promoted early major and career related decisions for students entering college and first-year students. They urge that “career exploration and planning must be intentional and start early in the educational experience” (Complete College America, 2018, p. 2). They propose that this can be accomplished by enrolling students in meta-majors so that the students maintain a focus on the courses they will need for graduation once they ultimately select a discrete major.

This approach may be contrasted with other recent studies that have reported that choosing a major later during college and/or changing majors did not have a deleterious effect on graduation rates. A 2016 study of over 78,000 students in across ten institutions found that
“students who switch to their final major in their junior or senior year graduate at nearly the same rate (a little more than 82%) as students who make their final declarations earlier” (EAB Student Success Collaborative, 2016, p. 4). In contrast to conventional wisdom, the EAB study found that “students who declare in their first term and never switch have decreased odds for graduation” (2016, p. 7).

Freedman (2013) argued that colleges should delay major choice until the student’s second year, since many first-year students are not developmentally ready or educationally prepared to make an effective choice. Her position, based on Perry’s stages of student development, predicts that because most first year students are in the dualism stage they “believe there is one ‘right’ major for them, and they tend to look to others for the answer (adviser, parents, peers, and faculty) rather than draw conclusions based on their own research, personal goals, and self-reflection” (Freedman, 2013, p. 3) Freedman concluded that students are not likely ready to choose a major until they experience the stage of multiplicity when they are better able to recognize various options, understand that there may not be only one right choice, and make decisions based on what they know about themselves.

**Knowledge of the core.** An examination of the frequencies for these variables reflected that the percentage of students in both the large and small class size conditions who reported that they knew which classes they need to graduate increased over the course of the semester. The amount of change (increase in knowledge) was greater for the students in the small class condition (increase from 78% to 90%) than for the students in the large class (increase from 75% to 83%). By the end of the semester, based on the frequency observations, more students in the small classes were knowledgeable of the core requirements for graduation than were students in the large class. However, a chi-square test of independence revealed that the percentage of
participants that reported knowledge of the core curriculum by the administration of the posttest was not significantly different by class size condition, $\chi^2 (1, N = 90) = .719, p < .396$. These measures show that class size condition alone was not a causal factor in the percentage of students who reported knowledge of the core curriculum by the end of the semester.

These findings are consistent with the conclusions of some researchers who have asserted that “class size is not particularly important factor when the goal of instruction is the acquisition of subject matter knowledge and academic skills” (Pascarella & Terenzini, 1991, p. 87) if knowledge of the core curriculum requirements is similar to subject matter knowledge. But the use of knowledge about the curriculum might require higher level thinking and critical thinking skills which many researchers have suggested are better learned in a small class venue. “When it comes to the attainment of higher-order academic skills such as problem solving, written expression, and critical thinking, students in smaller classes do acquire more of these skills than do students in larger classes” (Schiming, n.d., p. 2). Small classes “tend to be effective because students are actively processing material rather than passively listening and reading” (McKeachie, 1990, p. 190). While there was not an attempt in this study to measure the students’ ability to make use of the knowledge of the core curriculum that they reported, future research might include this for analyses.

An extraneous factor that may have influenced these findings was that all students, regardless of class size assignment, were required to meet with a professional academic advisor for registration. The advisor presented information about the core in lecture format for each class section and then made appointments to meet with each student individually to discuss their pathway. Therefore, it is possible that students in both the large and small class settings may
have reported knowledge of the core curriculum, not because they learned it in class (from the lecture by the advisor) but because they learned it in the individual meeting with the advisor.

**Graduation Planning.** The third survey question designed to address whether the students had a clear academic plan and pathway was related to planning for graduation. The expectation was that most students would report that they had completed a written graduation plan since so doing was an assignment in the course. It was not a graded assignment, but the students were supposed to complete a graduation plan form from their textbook and present it to their advisor when they had their individual advisement meeting.

The frequency observations for the question about the graduation plan were similar to those for the questions about knowledge of the core curriculum. The valid percent of students who had completed a written graduation plan increased by 12.7 percent from 47.3 percent on the pretest to 60 percent on the posttest. There was a larger increase (26.1%) between the pretest (40.6%) and posttest (66.7%) for the small class size condition. However, the chi square analysis for class size condition and the graduation plan question on the posttest indicated no significant difference between the large and small class size conditions on the posttest responses, $\chi^2 (1, N = 90) = .378, p <.539$.

These findings demonstrated that class size condition alone was not a causal factor predicting the percentage of students who completed a graduation plan by the end of the semester. Nevertheless, these findings are alarming since no more than two-thirds of the students in this study completed this critical assignment and, as an assessment of the FYS, the findings demonstrate a need for improvement in addressing this outcome.

The importance of this variable has been underscored by the volume of legislative events in recent years that have called for guided pathways. “Guided pathways are emerging as a...
strategy to help students complete a credential in a timely manner by encouraging or requiring them to select a program, and develop a degree plan or map, on a specified timeline” (Fulton, 2017, p. 1). Eleven States considered guided pathways legislation in 2016 and 2017. As of April 2017, 22 bills had been introduced. In addition, guided pathways has been heavily promoted by the American Association of Community Colleges (AACC) (Jenkins, Lahr, & Fink, 2017) and Complete College America (Complete College America, 2014).

Effect of Class Size on Engaged Learning

Eleven survey questions were used to measure engaged learning behaviors practiced by the student participants. There were eight questions that measured engagement behaviors including academic related interactions with the instructor, consulting the syllabus, and implementing learning and study strategies that were taught in the FYS. There were three questions that measured disengagement behaviors including failure to complete readings or assignments before class, coming late to class, and submitting assignments late.

Engagement behaviors. Analysis of all eight engagement questions together as a composite revealed that over the course of the semester engagement behaviors increased for students in the large class but remained the same for students in the small class condition. Analysis of the degree of change that occurred between the large and small classes revealed no significant difference. An increase of reported engagement behaviors was observed for students in the large class, but class size was not causal because the students in the large class did not change more than did the students in the small class. However, this means that the hypothesis (H4) that students in the small class condition will score higher on the engaged learning questions than will students in the large class condition was not supported.
Disengagement behaviors. The findings for disengagement behaviors was similar to those for engagement behaviors. Analysis of the three disengagement questions together as a composite revealed that over the course of the semester disengagement behaviors increased for students in the large class but remained the same for students in the small class condition. This finding of less engagement (or decreased engagement) for students in the large class condition is opposite from the desired course outcome. It means that students in the large class reported that they were late to class, submitted assignments late, and failed to complete readings or assignments before class more often over the course of the semester.

Analysis of the degree of change that occurred between the large and small classes revealed no significant difference. There was an increase of reported disengagement behaviors was observed for students in the large class, but class size was not causal because the students in the large class did not change more than did the students in the small class. The findings concerning disengagement behaviors did not support hypothesis four (H₄) because students in the small class condition did not disengage less that did students in the large class condition.

Effect of Class Size on Academic Support Network

There were three survey questions used to measure the impact of class size on the degree to which the student sought help from existing academic support resources. Specifically, the student participants were asked to report how often they sought help from their professors, how often they visited the professor during his or her office hours for help, and how often they sought help from the tutoring center (called the ACE, Academic Center for Excellence). One of the goals of the FYS was to make students aware of these resources and to promote the use of the resources. The hypothesis (H₅) that students in the small class condition will score higher on the
academic and social support network questions than will students in the large class condition reflected this goal.

When each class size condition was analyzed separately the findings for this variable (help seeking behaviors) were similar to those for engagement and disengagement behaviors. Analysis for a composite of the three academic support questions revealed that over the course of the semester students in the large class increased the frequency with which they sought help from their professors or from the ACE but there was no change over the course of the semester for students in the small class condition.

However, analysis of the degree of change in help seeking behavior that occurred between the large and small classes was significantly different. Students in the large class sought help more often near the end of the semester than they did at the beginning of the semester while students in the small classes did not report a change in help seeking behaviors. An independent-samples t-test was conducted to compare the degree of change reported in help seeking behavior by students in the large class condition ($M=10.0139, SD=22.1984$) from students in the small class condition ($M=2.7654, SD=23.7041$) revealed that there was a significant difference between them ($t(73) = 2.335, p = .022$). Simply stated, this means that the students in the large class sought help more often than did the students in the small classes. This finding does not support the hypothesis which predicted that the students in the small classes would be more active in seeking help.

It is difficult to explain this unexpected result using the data collected in this study. The hypothesis assumed that the need for academic assistance would be about the same for students regardless of class size condition. If this was true, then the researcher cannot explain the difference between help seeking behavior for the large and small class size groups as a result of
the students in the large class having or feeling a greater need for assistance outside of class. Further, the study did not measure the difference in the use of academic support between the class size categories; it measured the difference in change reported for the use of academic support by the large class compared to the difference in change reported by students in the small group. This change for the large class was significantly larger between pre and post measures than was the change for the small class condition.

Smith and associates (2017) found that underuse of faculty office hours stems from the student perception of office hours as “the last resort they can turn to when an academic crisis (e.g., an anticipated failing score) is on the horizon, rather than as an institutional resource that may be regularly used for a broader set of fruitful interactions with faculty members” (p. 15). This begs the question, did students in the small class condition seek help less often because, early in the semester, they learned and practiced lessons from the FYS that kept them from experiencing a sense of academic crisis? Some of the FYS lesson content that could have resulted in this effect included adopting a focus on learning rather than a focus on grades, participating in small group study outside of class, using proven study and learning techniques such as the SOAR method, taking notes in class, completing readings and assignments prior to class sessions, and devoting an appropriate amount of time to study endeavors to name a few. Ultimately this question cannot be answered using the only the data collected for this study but perhaps some ad hoc analysis of variation for these variables would offer partial illumination. The addition of a qualitative component could provide rich data to examine this dynamic.

**Effect of Class Size on Next Semester Retention**

The hypothesis (H6) that students in the small class condition will be retained from spring to fall semester at a higher rate than will students in the large class condition was not supported
by data from this study. A chi-square test of independence revealed no significant difference between the large and small groups in retention for the next semester, $\chi^2 (1, N = 114) = .296, p < .586$.

The hypothesis was based on the assumption that smaller classes would include more student-faculty interactions and more active involvement in the college experience. Cuseo (2007) argued that these were among the qualities of small classes that are strongly correlated with student retention.

The positive relationship between small-class experience and (a) students’ college satisfaction and (b) student persistence to course completion would clearly suggest that increasing the opportunities for undergraduates to experience small-sized classes will serve to elevate their retention rate. This would be especially true if the increased opportunities for small-class learning take place during the first year of college, which is the stage of the college experience when class sizes tend to be largest and student attrition tends to be highest (Cuseo, 2007, p. 9)

If this is true, then one might expect higher retention rates among students who experienced the FYS in a small class setting. However, even if the FYS is a small class size, the expectation might not hold in cases where the students experience many large classes during their first year for other courses.

**Limitations of the Study**

Limitations noted in this study include the small sample size, the time semester when the study was conducted, and the scope of data collection limited to the main campus and the use of locally constructed survey questions and the use of a quantitative rather than a mixed methods approach. The following is a detailed analysis of the limitations and their impact on this study.
First, the number of participants and the number of class sections were limited since the study was conducted during spring semester. The large class size condition for this study consisted of 85 students and there were three sections of 15 students. But if the study were conducted in fall, the total number of participants on the main campus would have been around 500 and that larger enrollment would have allowed for two large sections of 200 students each and about six small sections of 15 students each. This would have more accurately depicted the actual conditions under which the course is taught: nearly 500 students are assigned to a single FYS section. A larger $N$ may have allowed more robust statistical analysis.

Second, the fall semester might have been a better time to conduct the study since it would have been the first semester for nearly all of the students enrolled in the FYS while the spring semester FYS might have included some students who had attended college in the fall but had not yet taken the FYS. The FYS might have been less influential for those second semester students if those students had already formed enduring perspectives and habits during the previous semester.

Third, the study was limited to the FYS sections and students on the main campus. The institution has three campus venues in three different cities separated by 40 to 80 miles. The FYS courses on the main campus are taught in two-year liberal arts college facility that is situated in a very rural location (population < 8,000) while the other two campuses are taught on the campus of a university and situated in larger population centers including one that is urban (populations are ~ 70,000 and over 600,000). The FYS is taught basically the same, using a common syllabus, on all three campuses but differences in campus culture might have affected the findings of the study had participants from all three campuses been included.
A fourth limitation was local construction of the questions used in the survey instruments. Five of the dependent variable categories were the same as the benchmarks used for the national SENSE study (NOVA, 2016) but the individual questions intended to measure the benchmarks were locally constructed. Cronbach alpha analysis was used to verify internal consistency, but a high alpha value does not imply that the measure is unidimensional. Therefore, the researcher cannot be sure that the locally constructed questions were sufficient to adequately measure the benchmarks or to adequately capture the differences between the large and small class venues.

For example, as previously noted, that the questions used to measure expectations and aspirations were less than exhaustive limits the degree to which this study can assess that variable. This is not to say that the findings regarding that variable failed to provide valuable insights but rather that the study would be stronger if the concept had been explored in greater detail.

Another limitation of this study was that it was not a double-blind experiment. In this study, the researcher was also the instructor for all of the FYS sections that were examined. Using another instructor or instructors who were unaware of the details of the study, in a double-blind experimental model, would have reduced the potential for bias and therefore would have strengthened the study. Also, the use of multiple instructors, so long as each instructor taught one or more courses under both class size conditions, would have controlled for or reduced the chance that teaching style, experience, or quality acted as an extraneous variable.

Finally, the study employed only quantitative analysis. Using this approach, the findings revealed the degree to which the participants reported various beliefs and behaviors, whether there was an increase or decrease in the behavior over time, and whether participants in the large and small class conditions differed with regard to the variables. However, it could not explain
why the participants held the reported perspectives or behaved the way they did. A mixed method approach that included qualitative components could have allowed the research to better explain the dynamic differences in student experience between the large and small conditions.

**Recommendations for Practice**

Recommendations for practice drawn from the findings of this study and from the research literature reviewed for the study include adopting a hybrid approach, training instructors in large and small class pedagogy, and combining with or including within the FYS other efforts that have been identified as high impact practices (HIP).

**Hybrid Approach**

Perhaps a hybrid approach would yield greater outcomes than the large or small class condition alone. The sense that one is part of and belongs to something much bigger than themselves may be an added value of conducting at least some course activities in a large group venue. Large group activities could stimulate collective energy, enthusiasm, and a sense of connection for first-year students in ways similar to the enthusiasm and connection thousands of sports fans in a stadium feel when cheering for their team or participating in physical gesture (such as the “wave” where the fans all raise and move their arms from side to side in unison). Large group activities of a solemn nature can also stimulate positive outcomes for students. For example, East Georgia State College incorporates the FYS students into the convocation each fall where the student recite the Bobcat pledge and are formally inducted into the community of scholars. In preparation for this event, the students in each section of the FYS practice for several weeks and complete a writing assignment in which they reflect on what the pledge means for them. The language of the Bobcat pledge promotes adoption of the college student identity, intellectual curiosity, academic honesty, and civility. Sociological theories about group
membership confirm that social belonging and personally meaningful interactions are enhanced by conducting at least some meaningful proportion of course activities in a small group venue. Sociologists have observed that the nature of the interaction between group members changes as the size of the group increases. Small group experiences in which the group members share meaningful gestures in a shared physical location, called co-presence (Goffman, 1963), are essential for meaningful interaction. They are important for the FYS because group interactions generate expectations which guide subsequent interactions (Bales & Borgatta, 1966). Soboroff (2012) explained,

The size of a group can also affect how aware members feel others will be of their behavior. Students in large lecture classrooms where professors are focused on the class as a whole may learn quickly that their anonymity allows them to surf the internet or send text messages through their cell phones with little chance of being penalized. Imbalances in expected awareness may reduce group member commitment to the group as a whole as people come to expect their actions have little impact on other group members (p. 10).

Training in Class Size Pedagogy

If large classes are a current reality or if they are unavoidable in the future (Mangan, 2016), then instructor training in effective large (and small) class pedagogy would be essential to the success of the program. Hattie argued that one reason that small classes were not more effective that large classes is because “teachers tend to use the same teaching methods regardless of class size” (Hattie, 2005, p. 407). Numerous articles in the literature review for this study took the approach that the solution to better learning outcomes was for instructors to adopt teaching strategies that were consistent with the class size to which they were assigned (Mangan, 2016; Mulryan-Kyne, 2010; Prosser & Trigwell, 2014; Singer-Freeman & Bastone, 2016).
One online training opportunity worth mentioning is the free online video series on effective teaching (Flynt, 2016) by Dr. Stephen Chew. Samford University psychology professor and department chair Stephen Chew was named the 2011 U. S. Professor of the Year for Master's Universities and Colleges by the Carnegie Foundation for the Advancement of Teaching. The video series, *Cognitive Principles of Effective Teaching*, presents research in cognitive psychology that teachers can use to improve the design, implementation and assessment of pedagogy. He also developed a series of six short videos on how to get the most out of studying for students that are available on YouTube (Chew, 2015) and could be incorporated into an FYS (Chew, 2012).

**Incorporating High Impact Practices and Small Group Workshops**

One way to enhance student connections to the college and to each other and promote desired program outcomes in spite of large class sections is to combine other high impact practices (HIPs) (Kuh, 2008) with the FYS or incorporate the HIPs into the structure of the FYS. The first-year seminar, itself, is a HIP. High impact practices are those programs or activities that, after extensive testing, have been shown to be beneficial for college students. They include both curricular and cocurricular structures. Some examples of HIPs include 1) first-year seminars and experiences, 2) common intellectual experiences, 3) learning communities, 4) writing-intensive courses, 5) collaborative assignments and projects, 6) undergraduate research, 7) diversity/global learning, 8) ePortfolios, 9) service learning, community-based learning, 10) internships and 10) capstone courses and projects.

Small group workshops incorporated into the structure of the large class condition FYS are another way to take advantage of the benefits of small group instruction. Many of the workshops can be taught by professional staff. Some of these workshops could be mandatory
extended orientation workshops while others might be special interest optional events. Examples include a library use workshop (led by librarians), a conduct workshop (led by the Director of Conduct and the campus Chief of Police), an advisement workshop (led by professional advisors), a mental health workshop (led by the Director of Counseling Services, a financial management workshop (led by financial aid staff), a resume workshop (led by personnel from Human Resources), a sexual assault prevention workshop (lead by the Title IX Director), an electronic communications workshop (led by personnel from Instructional Technology) and others.

**Recommendations for Future Study**

The findings of this study were surprising to the researcher since they contradicted the researcher’s personal bias that were expressed in the hypotheses. The findings also were inconsistent with many other studies in the literature that have suggested that small class size is objectively better. However, there were also a plethora of studies that defended the large class size condition and suggested that poor teaching practices rather than large classes were the primary problem preventing improved outcome measures (Mulryan-Kyne, 2010; Singer-Freeman & Bastone, 2016). Future studies should employ triangulation by including both quantitative and qualitative components to acquire a more complete understanding of the impact of class size on desired outcomes. Future studies should test the research question using a much larger sample such that there are multiple sections for each condition and such that the large sections could have hundreds of students enrolled (at least 100 per section). It may also be wise to isolate a single benchmark to measure and to develop valid questions to accurately measure the concept (rather than attempting to evaluate all five benchmarks at once.). The questions should be piloted and tested for internal consistency, validity and reliability prior to launching the study.
Conclusion

A summary of the study, a discussion of the findings, conclusions based on the findings, limitations of the study, recommendations for practice, and recommendations for future research were presented in this chapter. The findings of research on class size over the past century have been mixed. This study does not resolve the issue, but it does add some insight and suggest that more research is needed, especially research examining class size for the first-year seminar.
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APPENDIX A

SPRING 2018 SYLLABUS
CATS 1101: CRITICAL AND ACADEMIC THINKING FOR SUCCESS
EAST GEORGIA STATE COLLEGE

<table>
<thead>
<tr>
<th>CRN</th>
<th>TIME</th>
<th>DAYS</th>
<th>ROOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>20348</td>
<td>11:00 AM – 11:50 AM</td>
<td>TUESDAY &amp; THURSDAY</td>
<td>AUDITORIUM OR TBA</td>
</tr>
</tbody>
</table>

I. INSTRUCTOR: Professor David L. Strickland

Welcome to the CATS class.

C.A.T.S. stands for Critical and Academic Thinking for Success and the CATS 1101 course is part of our First-Year Experience program at EGSC. It is a college-level academic course which is part of the core required for graduation. The goal of the course is to help you experience an effective transition to college and prepare to get the most out of your college experience. That includes developing a college student identity and sharpening your critical thinking skills.

Please feel comfortable coming to me with any questions or problems you have about this course or about college this semester. If I don’t know the answer, I will try to connect you to someone on campus who does and who will help you. Since this class is online, most of our communication will be via email. Please use the email tool in D2L to contact me regarding this course. I will also be happy to meet with you in my office on the Swainsboro campus. I have reserved some office hours just for that purpose but beyond that I am on campus almost every week Monday through Thursday and will be happy to meet with you almost any time by appointment. I will not be available on Fridays because I will be teaching at an off-campus location on Fridays this semester.

II. OFFICE INFORMATION

Office Location: C 269 (http://faculty.ega.edu/facweb/strickland/SYLLABUS/stricklandoffice.jpg)

Campus Map: http://www.ega.edu/map

Building Floor Plan Map: http://www.ega.edu/room_locations

Office Phone: 478–289–2061 Fax: 478–289–2141

Office Hours: Mondays - Thursdays from 12:30 PM to 3:00 PM and other times by appointment.

Email: The college email address for the professor is dstrick@ega.edu. However, all email communication for this course should be handled within the D2L Brightspace system.

I want you to act like the professional that you are becoming. So, when you send email messages to me about class or college issues, I insist that you construct them in a professional manner and that you include all the information which is necessary.

When you use email to contact any of your professors, please adhere to the following guidelines (See Ch. 2, pp. 90-91 in your textbook).

1. Always include your full name as part of the message.
2. Always include information to identify about which class you are writing. Put this information in the “Subject” field of your email. Specify the name of the class (e.g. CATS 1101), and the section (e.g. Section WA) or class meeting room and time (e.g. Online).
3. Always include your contact information (such as your email address and/or phone number) so that the professor may respond to your message if necessary.
4. Always use complete sentences and correct grammar.
III. COURSE DESCRIPTION

The Critical & Academic Thinking for Success (CATS 1101) course is the first-year seminar course at East Georgia State College. It is part of the college (first year) experience program (called FIRST CLASS). The course serves as a guide and support for you as you transition into college and develop your identity as a student scholar. The required readings and class presentations/videos will guide you to develop your college student identity as a scholar and will enable you to self-regulate and to take responsibility for your own learning and production of knowledge. As a part of the course you will create a portfolio that will help you demonstrate your learning and achievements in college. The course will also help you connect to the resources and people on campus that can help the you be a more effective learner. The course is designed to help you complete your program of study, and to graduate or to transfer and then graduate.

IV. PREREQUISITES (None)

V. TEXTBOOK


BINDERS: You will need a binder (3-ring) for the loose-leaf textbook.

The textbook is REQUIRED for this course.

VI. COURSE LEARNING OUTCOMES

This table lists the outcomes you should experience because of completing this course.

<table>
<thead>
<tr>
<th>Competency</th>
<th>Learning Objective</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. College Student Identity</td>
<td>Define self as a student scholar. Focus on learning. Seek learning opportunities.</td>
<td>You will be able to define your role as student scholar who maintains a focus on learning and seeks learning opportunities in the classroom and throughout the campus community.</td>
</tr>
<tr>
<td>2. Student Engagement</td>
<td>Engage learning in the classroom. Engage learning on campus.</td>
<td>You will be able to model student scholarship by engaging in learning opportunities throughout the campus community.</td>
</tr>
<tr>
<td>3. Critical Thinking*</td>
<td>Practice critical thinking.</td>
<td>You will be able to demonstrate the ability to (a) gather, (b) analyze, and (c) evaluate information to make effective decisions.</td>
</tr>
<tr>
<td>4. Study Plan</td>
<td>Create a study plan for each course. Maintain a record of academic progress.</td>
<td>You will be able to design personal learning strategies consistent with learning theories and recommended techniques presented in the class or textbook.</td>
</tr>
<tr>
<td>5. Academic Skills*</td>
<td>Improve academic skills.</td>
<td>You will be able to demonstrate the ability to (a) read, (b) write, (c) speak, and (d) listen with the competence necessary to succeed in higher education.</td>
</tr>
<tr>
<td>6. Communication Skills</td>
<td>Demonstrate professional communication skills.</td>
<td>You will be able to demonstrate scholarly and professional level communication when interacting with peers, faculty, staff, advisors, and visitors on campus.</td>
</tr>
<tr>
<td>7. Information Technology Skills</td>
<td>Demonstrate information technology skills germane to success in college.</td>
<td>You will be able to access, manage, and present information available through traditional and electronic media.</td>
</tr>
<tr>
<td>8. Resource Utilization</td>
<td>Identify resources on campus. Use resources on campus.</td>
<td>You will be able to identify and use resources on campus that will assist you to think critically and become an effective learner in college.</td>
</tr>
</tbody>
</table>

Independent Learning Objectives/Activities

- Choose a major or pathway.
- Create a graduation plan.
- Create an electronic portfolio.
- Engage in Title IX training.

*Core courses at East Georgia State College collectively address six general education competencies. Two of the course objectives (#3 & #5) comprise the General Education Outcome communication and critical thinking competencies verbatim.
Appendix A (Syllabus page 3 of 10)

VII. EVALUATION

Your grade for this course will be based on attendance plus the successful completion of (A) quizzes, (B) lesson assignments and your (C) electronic portfolio project. These three are weighted such that the semester grade may be calculated as follows:

Semester Grade = (Average of Quiz Scores X 40%) + (Portfolio Grade X 30%) + (Average of Assignments Grades X 20%) + (Attendance Grade X 10%)

Please note, that a letter grade of C - 70 or higher is required to pass the course. If you don’t pass the course, you will have to repeat it because the course is required for graduation.

A. Quizzes

There will a timed online quiz for each chapter of the textbook that is assigned in a learning module. The quizzes will be delivered online through Brightspace by D2L. Each quiz will have 10 questions and will be timed at 10 minutes (with a few exceptions where more time is allotted). You will be allowed up to three attempts for each quiz and the permanent grade for each quiz will be the average score for all of your attempts. See the Weekly Course Schedule (attached) to find out the deadline for each quiz. Failure to complete a quiz before the deadline will result in a grade of zero for that quiz.

B. Assignments

Descriptions for various assignments related to the content of the course are presented in some of the learning modules in D2L. The assignments have deadlines. Please ask the professor to explain any of the assignments where the instructions are not perfectly clear to you.

C. Portfolio Project

Your portfolio will be a website that is an electronic collection of evidence that shows your learning journey over time. It is a place online where you can display evidence (called artifacts) of your skills, learning, and experiences. Detailed instructions explaining how to create your portfolio are provided in the relevant course module in D2L. A grading rubric is also provided in D2L (and at the end of this syllabus) so that you can see how the portfolio will be graded.

VIII. GRADING

The semester grade will be determined by the student’s performance on online graded quizzes, assignments, the portfolio project and attendance. A Record of Grades worksheet appears on pages 9-10.

The letter grade which appears in Banner and on your official transcript corresponds with the numeric semester grade as follows:

90 -100 = A, 80 – 89 = B, 70 – 79 = C, or 0 - 70 = F.

A letter grade of C or higher is required to pass this course. Students who fail will be required to take a remedial version of the course during the next subsequent semester.

IX. ATTENDANCE POLICY

Attendance and connecting with the professor, workshop leaders, study groups, and other students in your class is very important for your success in college. Therefore, attendance will account for part of the semester grade. Students will earn points (3.5) for each class session that they attend.

X. MAKE-UP POLICY

There are no make-up quizzes except in extreme cases at the discretion of the professor. There is no need for a student to miss a quiz since the quizzes are available online and long before the due date. It is your responsibility to plan ahead and complete the quizzes and assignments well in advance of the deadline so that you have a buffer period in which to complete the quiz or assignment in the event of an unexpected set-back. In the unlikely event that a make-up is ever indicated, then the details of the make-up assignment must be arranged and approved by the professor at that time. Due to the nature of the assignments, some assignments cannot be made up after the deadline.
**XI. PLAGIARISM & ACADEMIC DISHONESTY**

The EGSC Student Handbook states that “It is the duty of the student to practice and preserve academic honesty” and “If the student has any doubt about a situation, he or she should consult with his or her instructor (p. 7).” Plagiarism (misrepresenting another’s work or ideas as your own) and academic dishonesty (including cheating, academic theft, collusion, and misrepresentation of credentials) are subject to severe sanctions (including withdrawal from the course with a grade of WF, entry of the violation in the academic dishonesty file, and expulsion from EGSC.) Please read the Student Handbook (available on the EGSC website) for descriptions of plagiarism, academic dishonesty, and the procedures followed when a violation occurs. It really is easy to avoid plagiarism if you understand what plagiarism is.

**XII. ADA STATEMENT**

If there is any student in this class who has special needs because of learning disabilities or other kinds of disabilities, he or she should discuss this problem with a college counselor (478-289-2039). Please notify the professor early in the semester and well in advance of any quizzes or other assignments that may require accommodation. The instructor will be pleased to accommodate the student in accordance with institutional policies. Having a learning disability is not a sign of lower intellectual ability. On the contrary, researchers have found that many learning-disabled students are often of higher than average intellectual ability. The learning disability may affect the method by which the student acquires and learns information or demonstrates that learning but having a learning disability does not impact raw intelligence. Please consult the official ADA statement for EGSC online.

**XIII. COURSE WITHDRAWAL POLICY STATEMENT**

You may not withdraw from CATS 1101 (except when withdrawing completely from school – all classes). You are responsible for your own academic progress. I and many other people at the college will be happy to help you when we can. So, if you are trying to decide whether to withdraw from a course, you should consult with your academic advisor before you take any action. If you receive financial aid, meet with a Financial Aid representative before withdrawing from a course so that you know if and in what way it might affect your financial aid situation.

**XIV. CAMPUS EMERGENCY POLICY**

A. When you are on campus, if the fire alarm is sounded, everyone must evacuate the building at once and in a calm and orderly fashion, using the nearest exit. In the event of a severe weather warning everyone must proceed immediately to the nearest designated shelter area which are marked by a small tornado symbol. All severe weather shelter locations are posted on the EGSC website. Each student should, on the first day of class, determine the location of the nearest exit and the nearest designated shelter area for each of his or her classrooms. If you have difficulties locating either, ask your instructor to assist you.

B. The Connect-ED system is a communication service that enables East Georgia State College administrators and security personnel to quickly contact all East Georgia State College students, faculty and staff with personalized voice and text messages that contain emergency-related campus information (e.g., campus closing, campus threat, health scare, etc.) With Connect-ED, East Georgia State College students can be reached and provided with vital instructions anywhere, anytime, through their cell phones, home phones, e-mail, TTY/TDD receiving devices, or other text-receiving devices. ([http://www.ega.edu/student_life/connected](http://www.ega.edu/student_life/connected)).

**XV. ADDITIONAL COURSE REQUIREMENTS**

Students will receive credit for participating in three surveys during the semester. A grade of 100 will be assigned for completing each survey or a grade of zero will be assigned if you do not complete the survey by the deadline.

Students will also participate in a non-graded course evaluation survey given near the end of the semester. The college (not the professor) will send the students an email notice with instructions about how to log onto the online course evaluation survey. The course evaluation survey is anonymous
Appendix A (Syllabus page 5 of 10)

XVI. DAILY COURSE SCHEDULE

The information which normally appears here, under XVI, has been placed into a table and appears at the end of this syllabus (pages 6 – 8). It is also provided as a separate handout which is available in D2L.

XVII. CAMPUS CARRY LEGISLATION (HB 280)

Beginning July 1st, 2017, new Campus Carry legislation relating to the carrying and possession of handguns on campus went into effect in the University System of Georgia.

Please review specific Campus Carry information on the College’s website www.ega.edu/campuscarry to determine the impact this new legislation may have on you, the student. Violation of the Campus Carry law is also a violation of the EGSC Student Code of Conduct.

Please direct questions or report suspected violations to the EGSC Police Department (478-289-2090).

XVIII. The Bobcat Pledge appears on the following page. It is very important because it highlights part of what it means to be an East Georgia State College student and a college student in general. College students are charged to abide by a high standard of scholarship, ethics, and professional behavior.

---

THE BOBCAT PLEDGE

As a member of East Georgia State College...

I pledge to maintain high standards of scholarship and excellence.

I will work with other students, faculty, and staff to strengthen teaching and learning on campus.

I pledge to practice academic honesty.

I will model and uphold academic integrity to earn trust and respect from all members of the community.

I pledge to act in a personally and socially responsible way.

I will treat everyone in the EGSC community with civility, courtesy, compassion, and dignity. I will respect the property and environment of the campus.

I pledge to value the intrinsic worth of every member of the community.

I will respect and learn from the ideas and opinions of different people.
<table>
<thead>
<tr>
<th>WEEK</th>
<th>DATE</th>
<th>DAY</th>
<th>DUE DATES</th>
<th>LESSON TOPICS</th>
<th>COLLEGE EVENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Jan. 8</td>
<td>Mon</td>
<td></td>
<td><strong>Orientation to Course</strong></td>
<td>Drop/Add</td>
</tr>
<tr>
<td></td>
<td>Jan. 9</td>
<td>Tue</td>
<td>Class in the Auditorium</td>
<td>1. Complete course surveys</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Jan. 10</td>
<td>Wed</td>
<td>Survey #1 Due</td>
<td>2. Get your textbook</td>
<td>Drop/Add until 5 PM</td>
</tr>
<tr>
<td></td>
<td>Jan. 11</td>
<td>Thu</td>
<td>Class in the Auditorium</td>
<td>3. Get to know the course</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Jan. 12</td>
<td>Fri</td>
<td></td>
<td>4. Get to know the CMS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Jan. 13</td>
<td>Sat</td>
<td></td>
<td>5. Get to know your class</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Jan. 14</td>
<td>Sun</td>
<td>Orientation Quiz Deadline</td>
<td>6. Get to know your college</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Jan. 15</td>
<td>Mon</td>
<td></td>
<td><strong>Lesson 01 Module</strong></td>
<td>MLK Day/No classes</td>
</tr>
<tr>
<td></td>
<td>Jan. 16</td>
<td>Tue</td>
<td>Class location by Groups</td>
<td>1. Defining success in college</td>
<td>Drop/Non-attendance</td>
</tr>
<tr>
<td></td>
<td>Jan. 17</td>
<td>Wed</td>
<td></td>
<td>2. Transition to college</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Jan. 18</td>
<td>Thu</td>
<td>Class location by Groups</td>
<td>3. Expectations for college</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Jan. 19</td>
<td>Fri</td>
<td></td>
<td>4. Establishing goals</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Jan. 20</td>
<td>Sat</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Jan. 21</td>
<td>Sun</td>
<td>Ch 01 Quiz Deadline - 9 PM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Jan. 22</td>
<td>Mon</td>
<td></td>
<td><strong>Lesson 02 Module</strong></td>
<td>Note: Lesson numbers and chapter numbers do not always match (ex: Lesson 2 is about chapter 5).</td>
</tr>
<tr>
<td></td>
<td>Jan. 23</td>
<td>Tue</td>
<td>Class location by Groups</td>
<td>1. Getting Organized</td>
<td>Fin Aid Refunds</td>
</tr>
<tr>
<td></td>
<td>Jan. 24</td>
<td>Wed</td>
<td>Start EverFi</td>
<td>2. Keeping records</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Jan. 25</td>
<td>Thu</td>
<td>Class location by Groups</td>
<td>3. Creating a study plan</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Jan. 26</td>
<td>Fri</td>
<td>Survey #2 Opens</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Jan. 27</td>
<td>Sat</td>
<td>Survey #2 Available</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Jan. 28</td>
<td>Sun</td>
<td>Survey #2 Deadline</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ch 05 Quiz Deadline - 9 PM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Jan. 29</td>
<td>Mon</td>
<td></td>
<td><strong>Lesson 03 Module</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Jan. 30</td>
<td>Tue</td>
<td>Class location by Groups</td>
<td>1. Connecting to resources</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Jan. 31</td>
<td>Wed</td>
<td></td>
<td>2. People</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Feb. 1</td>
<td>Thu</td>
<td>Class location by Groups</td>
<td>3. Places</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Feb. 2</td>
<td>Fri</td>
<td></td>
<td>4. Things</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Feb. 3</td>
<td>Sat</td>
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### EFFECTS OF CLASS SIZE FOR FIRST YEAR SEMINAR

**Appendix A (Syllabus page 7 of 10)**

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## Appendix A (Syllabus page 8 of 10)

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**CATS 1101 Spring 2018 Record of Grades**

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Earn 3.5 points for every time you attend up to 112.

### ASSIGNMENTS GRADE

**QUizzes**

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**Quizzes Grade** (Average of all quiz scores) = (Sum of scores / 13)
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<td>14.</td>
<td>Bobcat Pledge Essay (Optional for extra credit)</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

**ASSIGNMENTS GRADE (Average of assignment)**

(\text{Sum of scores / 13}) =

### PORTFOLIO PROJECT

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Value</th>
<th>Your Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Home Page</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Student Name</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Student Photo</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Introductory Statement or Paragraph</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Links to five artifact pages:</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1) Resume,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2) Writing Sample,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3) Academic Projects,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4) Clubs and Sports Activities, and</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5) Service Activities Skills</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Artifact Pages</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Resume Content</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Writing Sample</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Academic Project Content</td>
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<td></td>
</tr>
<tr>
<td>10.</td>
<td>Clubs/Sports Involvement Content</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>Service Projects Content</td>
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<td></td>
</tr>
<tr>
<td>12.</td>
<td>Bonus Points</td>
<td></td>
<td></td>
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<tr>
<td>13.</td>
<td>Creativity</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>Additional Content</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

**PORTFOLIO GRADE**

(\text{Sum of scores}) =

### Semester Grade Calculation Formula

\[
\text{Semester Grade} = \left(\frac{\text{Attendance Grade}}{10}\right) + \left(\frac{\text{Assignments Grade}}{20}\right) + \left(\frac{\text{Portfolio Grade}}{30}\right) + \left(\frac{\text{Quizzes Grade}}{40}\right)
\]
APPENDIX B - Survey #1

SPRING 2018 CATS Survey #1 (KSU IRB Study #18-399)

Introduction
Thank you for participating in this survey. You are being invited to take part in a research study conducted by David L. Strickland of Kennesaw State University. Before you decide to participate in this study, you should read this form and ask questions about anything that you do not understand.

Description of Project
The purpose of the study is to determine what effect, if any, the size of a CATS 1101 class has on the quality of the course. It is not an assessment of you, or any student. Your answers will not affect your grade.

Explanation of Procedures
Your role in the study will be to complete three online surveys during the semester in which you answer questions about your experience as a student at EGSC this semester. Each survey will take about 5 minutes to complete. Participation is voluntary. You may skip any question that you do not wish to answer, and you may decide not to do the survey at all if you wish.

Risks or Benefits (Class Credit)
There are no known risks associated with completing this survey. You will receive what amounts to 2 points on your semester grade for each of the 3 surveys you complete for this study. If you decide not to complete the survey, then you may instead complete the alternative reflection essay assignment, which requires the same time investment. Both the surveys and the alternative assignments have the same deadlines and grade point values.

Confidentiality
This survey is confidential. The findings of this survey will only be reported in aggregate form. This means that the responses of an individual will never be reported and instead only statistics about the responses of the whole group will be reported. Although your name will initially be collected so that you can earn credit for participating, once the survey data is downloaded, your name will be removed and will never appear in any reports.

Inclusion Criteria for Participation
You must be 18 years of age or older and enrolled in CATS 1101 at EGSC to participate in this study.

Use of Online Survey
This survey will be conducted online using survey monkey. IP addresses will not be collected. Once the data is downloaded, it will be stored on a password protected desktop computer and deleted from survey monkey. Once the pre-and-post versions of the survey data have been merged on a computer, your name (all names) and all other identifying information will be permanently deleted. The data will be maintained until the findings have been disseminated. At that time, all data will be deleted from the computer (approximately one-year after the start of the study).

Research at Kennesaw State University that involves human participants is carried out under the oversight of an Institutional Review Board. Questions or problems regarding these activities should be addressed to the Institutional Review Board, Kennesaw State University, 585 Cobb Avenue, KH3403, Kennesaw, GA 30144-5591, (470) 578-2268.

PLEASE PRINT A COPY OF THIS CONSENT DOCUMENT FOR YOUR RECORDS, OR IF YOU DO NOT HAVE PRINT CAPABILITIES, YOU MAY CONTACT THE RESEARCHER TO OBTAIN A COPY

Researcher’s Contact Information
David L. Strickland, Director of First-Year Experience, East Georgia State College, 478-289-2061, dstrick@ega.edu
SPRING 2018 CATS Survey #1 (KSU IRB Study #18-399)

Thank you for participating in this survey.

Your completion of the survey constitutes your consent for us to use the data (not including your name or any identifying information) that you provide for our study.

Based on pilot versions of this survey, the survey is expected to take about 5 minutes.

1. What is your first name?
   __________________________

2. What is your last name?
   __________________________

3. Do you agree to complete this survey?
   - [ ] Yes. If you check yes, you proceed to the next question (#4) on the next screen.
   - [ ] No. If you check no, the survey ends here. Click "Done" and exit the survey.

4. What is your EGSC Student ID number?
   __________________________

5. Have you ever taken any college courses before this semester?
   - [ ] No
   - [ ] Yes

6. If you answered yes to the previous question (indicating that you have taken a college course before), where did you take the college course(s)? Type your response in the comment box provided. Leave it blank if you have never taken a college course before this semester.
   __________________________
7. Which of the following members of your immediate family have taken at least one college course?

- No one in my family has taken college courses.
- Father
- Mother
- Sibling (brother or sister)
- Primary Guardian (a person who is not your parent but who raised you during your teenage years)
- Grandparent (any of your grandparents)

8. Which of the following members of your immediate family have earned a 2-year college degree (Associate degree)? (Check all that apply.)

- No one in my family has an Associate’s Degree or other two-year degree.
- Father
- Mother
- Sibling (brother or sister)
- Primary Guardian (a person who is not your parent but who raised you during your teenage years)
- Grandparent (any of your grandparents)

9. Which of the following members of your immediate family have earned a 4-year college degree (Bachelor’s degree)? (Check all that apply.)

- No one in my family has a Bachelors’ degree.
- Father
- Mother
- Sibling (brother or sister)
- Primary Guardian (a person who is not your parent but who raised you during your teenage years)
- Grandparent (any of your grandparents)

10. Which of the following members of your immediate family have earned a graduate level college degree (Master's degree, Doctoral Degree such as PhD., Professional Degree such as M.D.)? (Check all that apply.)

- No one in my family has a Master's level or higher degree.
- Father
- Mother
- Sibling (brother or sister)
- Primary Guardian (a person who is not your parent but who raised you during your teenage years)
- Grandparent (any of your grandparents)
11. How many credit hours are you taking this semester? 
__________________________________________

12. How many hours per week do you work at a job for pay?  
☐ I do not have a job for pay.  
☐ I work full-time (35 hours or more per week).  
☐ I work part-time (20 to 34 hours per week).  
☐ I work part-time (less than 20 hours per week).

13. If you have a job for pay, do you work on campus (for example at a work-study job or a student assistant job)?  
☐ I do not have a job for pay.  
☐ I have a job but it is not on campus.  
☐ I have a job on campus.  
☐ I have multiple jobs and at least one of them is on campus.

14. Do you participate in any volunteer activities which are not for formal pay (such as being an EGSC Ambassador or volunteering at an animal shelter, etc.)?  
☐ I do not participate in an volunteer activities.  
☐ I spend 1 to 5 hours per week doing volunteer activities.  
☐ I spend 6 to 10 hours per week doing volunteer activities.  
☐ I spend more than 10 hours per week doing volunteer activities.

15. How many student organizations or clubs do you currently belong to on campus?  
☐ I do not belong to any campus clubs or student organizations.  
☐ I belong to one campus club or student organization.  
☐ I belong to two campus clubs or student organizations.  
☐ I belong to three campus clubs or student organizations.  
☐ I belong to more than three campus clubs or student organizations.

16. While you are in college, are you the primary caretaker for members of your family (such as children, siblings, elderly parents, other relatives, or any combination of these).  
☐ No  
☐ Yes

17. What does success in college mean to you?  
__________________________________________

18. Which EGSC campus do you attend as your primary campus?  
☐ The Swainsboro campus  
☐ The Statesboro Campus  
☐ The Augusta Campus
APPENDIX C – Survey #2 Pretest (and Survey #3 Posttest content)

SPRING 2018 CATS Survey #1 (KSU IRB Study #18-399)

Introduction
Thank you for participating in this survey. You are being invited to take part in a research study conducted by David L. Strickland of Kennesaw State University. Before you decide to participate in this study, you should read this form and ask questions about anything that you do not understand.

Description of Project
The purpose of the study is to determine what effect, if any, the size of a CATS 1101 class has on the quality of the course. It is not an assessment of you, or any student. Your answers will not affect your grade.

Explanation of Procedures
Your role in the study will be to complete three online surveys during the semester in which you answer questions about your experience as a student at EGSC this semester. Each survey will take about 5 minutes to complete. Participation is voluntary. You may skip any question that you do not wish to answer, and you may decide not to do the survey at all if you wish.

Risks or Benefits (Class Credit)
There are no known risks associated with completing this survey. You will receive what amounts to 2 points on your semester grade for each of the 3 surveys you complete for this study. If you decide not to complete the survey, then you may instead complete the alternative reflection essay assignment, which requires the same time investment. Both the surveys and the alternative assignments have the same deadlines and grade point values.

Confidentiality
This survey is confidential. The findings of this survey will only be reported in aggregate form. This means that the responses of an individual will never be reported and instead only statistics about the responses of the whole group will be reported. Although your name will initially be collected so that you can earn credit for participating, once the survey data is downloaded, your name will be removed and will never appear in any reports.

Inclusion Criteria for Participation
You must be 18 years of age or older and enrolled in CATS 1101 at EGSC to participate in this study.

Use of Online Survey
This survey will be conducted online using survey monkey. IP addresses will not be collected. Once the data is downloaded, it will be stored on a password protected desktop computer and deleted from survey monkey. Once the pre-and-post versions of the survey data have been merged on a computer, your name (all names) and all other identifying information will be permanently deleted. The data will be maintained until the findings have been disseminated. At that time, all data will be deleted from the computer (approximately one-year after the start of the study).

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Researcher's Contact Information
David L. Strickland, Director of First-Year Experience, East Georgia State College, 478-289-2061, dstrick@ega.edu
APPENDIX C – Survey #2 Pretest (and Survey #3 Posttest content)

SPRING 2018 CATS SURVEY #2 (Swainsboro) A KSU IRB Study #18-399

Welcome
Thank you for participating in this survey.
Participation is voluntary.
Your completion of the survey constitutes your consent for us to use the data (not including your name or any identifying information) that you provide for our study.
Based on pilot versions of this survey, the survey is expected to take about 7 minutes.

1. What is your first name?
_______________________

2. What is your last name?
_______________________

3. Do you agree to complete this survey?
   ❑ Yes. If you check yes, you proceed to the next question (#4) on the next screen.
   ❑ No. If you check no, the survey ends here. Click “Done” to exit the survey.

4. What is your student ID number (your EGSC student ID, which begins with 930....)?
_______________________

5. Which EGSC campus is your primary campus?
   ❑ The Swainsboro campus
   ❑ The Statesboro campus
   ❑ The Augusta campus
   ❑ Online ONLY

6. Have you selected a major yet?
   ❑ Yes.
   ❑ No.

7. What is your major or transfer pathway? (if you have not selected a major or don't know, type "undecided.")
_______________________
8. Do you know which classes you need to take from this semester until you graduate?
   0 (Disagree) - 50 (Agree) - 100 (Strongly Agree)

9. Have you created a written graduation plan in which you listed all the classes you need to graduate?
   0 (Disagree) - 50 (Agree) - 100 (Strongly Agree)

10. To what extent do you agree or disagree with this statement: I believe my instructors want me to succeed in college?
    0 (Disagree) - 50 (Agree) - 100 (Strongly Agree)

11. To what extent do you agree or disagree with this statement: I am confident that I will graduate from college?
    0 (Disagree) - 50 (Agree) - 100 (Strongly Agree)

12. To what extent do you agree or disagree with this statement: I feel like I belong at this college?
    0 (Disagree) - 50 (Agree) - 100 (Strongly Agree)

13. To what extent do you agree or disagree with this statement: There is someone on campus (such as a faculty, staff, administrator, librarian, tutor, etc.) who really knows me on an individual basis?
    0 (Disagree) - 50 (Agree) - 100 (Strongly Agree)

14. Since the beginning of this semester, how often did you participate in a study group outside any of your classes?
    0 (Never) - 50 (Sometimes) - 100 (Always)

15. Since the beginning of this semester, how often did you discuss any assignment or grade with any instructor?
    0 (Never) - 50 (Sometimes) - 100 (Always)

16. Since the beginning of this semester, how often did you turn in an assignment late for any of your classes?
    0 (Never) - 50 (Sometimes) - 100 (Always)

17. Since the beginning of this semester, how often did you come to any of your classes without completing the readings or assignments before class?
    0 (Never) - 50 (Sometimes) - 100 (Always)

18. Since the beginning of this semester, how often did you refer to the syllabus for any of your classes?
    0 (Never) - 50 (Sometimes) - 100 (Always)

19. Since the beginning of this semester, how often did you take notes in any of your classes?
    0 (Never) - 50 (Sometimes) - 100 (Always)

20. Since the beginning of this semester, how often did you make a list of the tasks you need to do to study for any of your classes?
    0 (Never) - 50 (Sometimes) - 100 (Always)
<table>
<thead>
<tr>
<th>Question</th>
<th>Response Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>21. Since the beginning of this semester, how often did you ask any of your professors for help?</td>
<td>0 (Never) - 50 (Sometimes) - 100 (Always)</td>
</tr>
<tr>
<td>22. Since the beginning of this semester, how often did you use the SOAR technique to study for any of your classes?</td>
<td>0 (Never) - 50 (Sometimes) - 100 (Always)</td>
</tr>
<tr>
<td>23. Since the beginning of this semester, how often did you attend a campus organization or club meeting?</td>
<td>0 (Never) - 50 (Sometimes) - 100 (Always)</td>
</tr>
<tr>
<td>24. Since the beginning of this semester, how often did you attend EGSC sports events?</td>
<td>0 (Never) - 50 (Sometimes) - 100 (Always)</td>
</tr>
<tr>
<td>25. Since the beginning of this semester, how often did you get tutoring help or other assistance from the ACE?</td>
<td>0 (Never) - 50 (Sometimes) - 100 (Always)</td>
</tr>
<tr>
<td>26. Since the beginning of this semester, how often did you arrive late to any of your classes?</td>
<td>0 (Never) - 50 (Sometimes) - 100 (Always)</td>
</tr>
<tr>
<td>27. Since the beginning of this semester, how often did you get help from any professor during office hours?</td>
<td>0 (Never) - 50 (Sometimes) - 100 (Always)</td>
</tr>
<tr>
<td>28. Since the beginning of this semester, how often did you study in a group outside of class time?</td>
<td>0 (Never) - 50 (Sometimes) - 100 (Always)</td>
</tr>
<tr>
<td>29. Since the beginning of this semester, how often did you answer a professor's question in any of your classes?</td>
<td>0 (Never) - 50 (Sometimes) - 100 (Always)</td>
</tr>
<tr>
<td>30. Since the beginning of this semester, how often did you ask the professor a question in any of your classes?</td>
<td>0 (Never) - 50 (Sometimes) - 100 (Always)</td>
</tr>
<tr>
<td>31. Since the beginning of this semester, how often did you participate in any learning opportunities on campus (such as Convocation, special speakers on campus, etc.)?</td>
<td>0 (Never) - 50 (Sometimes) - 100 (Always)</td>
</tr>
</tbody>
</table>
## Benchmarks of Effective Practice with Entering Students

### Early Connections
When students describe their early college experiences, they typically reflect on occasions when they felt discouraged or thought about dropping out. Their reasons for persisting almost always include one common element: a strong, early connection to someone at the college.

<table>
<thead>
<tr>
<th>SENSE Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>18a</td>
</tr>
<tr>
<td>18b</td>
</tr>
<tr>
<td>18c</td>
</tr>
<tr>
<td>18d</td>
</tr>
<tr>
<td>18e</td>
</tr>
</tbody>
</table>

### High Expectations and Aspirations
Nearly all students arrive at their community colleges intending to succeed and believing that they have the motivation to do so. When entering students perceive clear, high expectations from college staff and faculty, they are more likely to understand what it takes to be successful and adopt behaviors that lead to achievement. Students then often rise to meet expectations, making it more likely that they will attain their goals. Often, students’ aspirations also climb, and they seek more advanced credentials than they originally envisioned.

<table>
<thead>
<tr>
<th>SENSE Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>19b</td>
</tr>
<tr>
<td>19c</td>
</tr>
<tr>
<td>19d</td>
</tr>
<tr>
<td>19e</td>
</tr>
<tr>
<td>19f</td>
</tr>
<tr>
<td>19g</td>
</tr>
<tr>
<td>19h</td>
</tr>
</tbody>
</table>

### Clear Academic Plan and Pathway
When a student, with knowledgeable assistance, creates a road map — one that shows where he or she is headed, what academic path to follow, and how long it will take to reach the end goal — that student has a critical tool for staying on track. Students are more likely to persist if they not only are advised about what courses to take, but also are helped to set academic goals and to create a plan for achieving them.

<table>
<thead>
<tr>
<th>SENSE Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>19i</td>
</tr>
<tr>
<td>19j</td>
</tr>
<tr>
<td>19k</td>
</tr>
<tr>
<td>19l</td>
</tr>
<tr>
<td>19m</td>
</tr>
</tbody>
</table>
EFFECTS OF CLASS SIZE FOR FIRST YEAR SEMINAR

APPENDIX D SENSE Benchmarks and Question Items (page 2 of 2)

Effective Track to College Readiness

Nationally, more than six in 10 entering community college students are underprepared for college-level work. Thus, significant improvements in student success will hinge upon effective assessment, placement of students into appropriate courses, and implementation of effective strategies to ensure that students build academic skills and receive needed support.

**SENSE Items**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>12a</td>
<td>Before I could register for classes I was required to take a placement test (COMPASS, ASSET, ACCUPLACER, SAT, ACT, etc.) to assess my skills in reading, writing, and/or math.</td>
</tr>
<tr>
<td>12b</td>
<td>I took a placement test (COMPASS, ASSET, ACCUPLACER, SAT, ACT, etc.)</td>
</tr>
<tr>
<td>14</td>
<td>This college required me to enroll in classes indicated by my placement test scores during my first semester/quarter.</td>
</tr>
<tr>
<td>21a</td>
<td>Agreement: Within a class or through another experience at this college, I learned to improve my study skills (listening, note-taking, highlighting readings, working with others, etc.).</td>
</tr>
<tr>
<td>21b</td>
<td>Agreement: Within a class or through another experience at this college, I learned to understand my academic strengths and weaknesses.</td>
</tr>
<tr>
<td>21c</td>
<td>Agreement: Within a class or through another experience at this college, I learned skills and strategies to improve my test-taking ability.</td>
</tr>
</tbody>
</table>

Engaged Learning

Instructional approaches that foster engaged learning are critical for student success. Because most community college students attend college part-time, and most also must find ways to balance their studies with work and family responsibilities, the most effective learning experiences will be those the college intentionally designs.

**SENSE Items**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>13a</td>
<td>Frequency: Ask questions in class or contribute to class discussions.</td>
</tr>
<tr>
<td>13b</td>
<td>Frequency: Prepare at least two drafts of a paper or assignment before turning it in.</td>
</tr>
<tr>
<td>13c</td>
<td>Frequency: Participate in supplemental instruction: extra class sessions with an instructor, tutor, or experienced student.</td>
</tr>
<tr>
<td>13g</td>
<td>Frequency: Work with other students on a project or assignment during class.</td>
</tr>
<tr>
<td>13h</td>
<td>Frequency: Work with classmates outside of class on class projects or assignments.</td>
</tr>
<tr>
<td>13i</td>
<td>Frequency: Participate in a required study group outside of class.</td>
</tr>
<tr>
<td>15k</td>
<td>Frequency: Participate in a student-initiated (not required) study group outside of class.</td>
</tr>
<tr>
<td>15l</td>
<td>Frequency: Use an electronic tool (e-mail, text messaging, Facebook, MySpace, class Web site, etc.) to communicate with another student about coursework.</td>
</tr>
<tr>
<td>15m</td>
<td>Frequency: Use an electronic tool (e-mail, text messaging, Facebook, MySpace, class Web site, etc.) to communicate with an instructor about coursework.</td>
</tr>
<tr>
<td>19a</td>
<td>Frequency: Discuss an assignment or grade with an instructor.</td>
</tr>
<tr>
<td>19b</td>
<td>Frequency: Ask for help from an instructor regarding questions or problems related to a class.</td>
</tr>
<tr>
<td>19c</td>
<td>Frequency: Receive prompt written or oral feedback from instructors on your performance.</td>
</tr>
<tr>
<td>19d</td>
<td>Frequency: Discuss ideas from readings or classes with instructors outside of class.</td>
</tr>
<tr>
<td>20a</td>
<td>Frequency of use: Face-to-face tutoring.</td>
</tr>
<tr>
<td>20b</td>
<td>Frequency of use: Writing, math, or other skill lab.</td>
</tr>
<tr>
<td>20c</td>
<td>Frequency of use: Computer lab.</td>
</tr>
</tbody>
</table>

Academic and Social Support Network

Students benefit from having a personal network that enables them to obtain information about college services, along with the academic and social support critical to student success. Because entering students often don't know what they don't know, colleges must purposefully create those networks.

**SENSE Items**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>18a</td>
<td>Agreement: All instructors clearly explained academic and student support services available at this college.</td>
</tr>
<tr>
<td>18b</td>
<td>Agreement: All instructors clearly explained course grading policies.</td>
</tr>
<tr>
<td>18c</td>
<td>Agreement: All instructors clearly explained course syllabi (syllabus).</td>
</tr>
<tr>
<td>18d</td>
<td>Agreement: I knew how to get in touch with my instructors outside of class.</td>
</tr>
<tr>
<td>18e</td>
<td>Agreement: At least one other student whom I didn't previously know learned my name.</td>
</tr>
<tr>
<td>18f</td>
<td>Agreement: At least one instructor learned my name.</td>
</tr>
<tr>
<td>18g</td>
<td>Agreement: I learned the name of at least one other student in most of my classes.</td>
</tr>
</tbody>
</table>