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School of Educational Leadership

Impacts of Class Size on Online Students' Academic Achievements and Cost of Instruction

A dissertation submitted in partial satisfaction

of the requirements for the degree of

Doctor of Education in Organizational Leadership

by

Getachew Wakgira

September 2024

Dedication

This dissertation is dedicated to my parents: My father Ato (Mr.) Wakgira Desta and my mother Woizero (Mrs.) Elfinesh Laki for showing me the value of education early in life. I dedicate this work to them even though they are no longer alive.

I also dedicate this work to my wife, Haregewoin Desta Wakgira, and my stepdaughter, Betelehem Kasahun. In the United States, to my sister Tsehai Wakjira, and to my brother Mesfin Wakgira. In Ethiopia, to my sisters Almaz Wakgira and Mame Wakgira, and to my brothers Daniel Wakgira, Samson Wakgira, Ephrem Wakgira, Yonas Wakgira, Eyobel Wakgira, and Yoseph Wakgira. Finally, I dedicate this work in memory of my sisters Dagmai Tensai Wakgira and Hirut Wakgira and in memory of my brothers Mekonnen Wakgira, Kiflu Wakgira, and Sirak Wakgira.

Acknowledgments

I thank all those who have played a role in supporting me in getting this far. I want to thank Dr. Timothy M. Stafford, Dissertation Chair, for his unwavering support and advice and for instilling in me the “I can do attitude.” Dr. Dana W. McMichael, Dean’s Representative and Dissertation Manager, for being there when I needed her help and sending me gentle reminders whenever I seemed to go off track. I also thank committee members Dr. Joe Cardot, III, for providing constructive suggestions, and Dr. Jeffry L. White for helping me brush up on my knowledge of research statistics, particularly the Mann–Whitney U test for nonparametric data. I like to thank Carah Barbarick, Administrative Coordinator, for her hard work in scheduling the final dissertation defense. I thank Katrina Kelley, Student Advisor, and all those student advisors before her, like Courtney Hernandez, Erica Laborde, and Elizabeth Brentzel, for their advice and encouragement. I would also like to thank Julie Johnson Archer, Director of the Online Writing Center, and Paula López, Editor, for their helpful editorial comments and suggestions on the final dissertation manuscript.

Finally, I thank my wife, Heregewoin Desta Wakgira, for her enduring patience while I could not always sit beside her while she watched her favorite TV shows. Thank God I will have time to watch her favorite TV shows with her going forward.

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Abstract

This research was designed to assess the impacts of class size on online students' academic achievements and the cost of instruction in the online learning environment. Two research questions revolved around this purpose. Since the 1950s, class size research has focused more on traditional but little on the online learning environment. Therefore, this research addressed this knowledge gap by focusing on the online learning environment. Pritchard and Woollard's (2010) classroom dynamics and Blum's (2005) connectedness theories served as the theoretical frameworks for this research. The research employed an ex post facto comparative design using random samples to determine if there were significant differences between small and large classes concerning academic achievements and the cost of instruction. IBM SPSS Statistics software was used to analyze the data, and the Mann–Whitney U test was used to interpret the results. Class size had a moderately significant impact on online students' academic achievements, as measured by the graduation rates within 4 years, and a statistically significant impact on the cost of instruction, as measured by the instructional expenditures per student. The results confirmed that students in small classes had better academic outcomes than large ones, but smaller classes were costly. The results will have important implications for stakeholders, such as higher education institution administrators, instructors, student parents, students, and accrediting agencies.

Keywords: academic achievements, class size, classroom dynamics theory, connectedness theory, graduation rate within 4 years, instructional expenditures per student, large class, small class, and stakeholders

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Chapter 1: Introduction

The tendency of academic institutions to manage class size to deal with increasing student enrollment and the cost of providing educational services is a phenomenon that has been around for a while. In addition to the seminal research conducted on class size reduction that I will discuss later, many studies have evaluated the impacts of class size on students' academic achievements since the 1950s. The literature review was grouped into four categories based on their findings: (a) small class size impacting students' academic achievements (Almulla, 2015; Diette & Raghav, 2015; Harfitt & Tsui, 2015; Koniewski, 2013; Krassel & Heinesen, 2014; Matta et al., 2015; McDonald, 2013; Nandrup, 2016; Owuor, 2018; Uhrain, 2016; Wright et al., 2019); (b) class size partially impacting students' academic achievements (Li & Konstantopoulos, 2016); (c) class size not impacting students' academic achievements (Bettinger et al., 2017; Blatchford & Russell, 2020; Sanni et al., 2021; Towner, 2016; Wilson, 2011); and, finally, (d) alternative views on the impacts class size on students' academic outcomes (Denny & Oppedisano, 2013; Lin et al., 2019; McArver, 2015). The alternative views in (d) indicated that increasing class size improved students' academic achievements, which went against the results of most of the studies conducted. Previous studies' conflicting outcomes indicated no consensus among the studies conducted concerning the impacts of class size on students' performance.

Pritchard and Woollard's (2010) classroom dynamics theory and Blum's (2005) connectedness theory were the theoretical frameworks for this research. Classroom dynamics theory attributes observed students' academic improvements to small class sizes. Pritchard and Woollard's (2010) classroom dynamics theory further states that small class size enables teachers to exert less effort in managing their classrooms and enable them to devote more time to instructional activities, which leads to improvements in students' academic achievements.

Pritchard and Woollard's (2010) classroom dynamics theory is also corroborated by Blum's (2005) connectedness theory, which attributes students' improved academic achievements to smaller classes. Students in small classes were more connected to other students than those in large classes. Blum (2005) discovered that students' connectedness helped them achieve better academic outcomes.

Statement of the Problem

The problem was that it was not known to what extent there was a statistically significant difference between online students' achievements in small and large classes, as measured by online students' graduation rates within 4 years and by the instructional expenditures per student. There was no consensus in the literature review on the potential impacts of class size on academic outcomes. The literature review also focused on traditional learning environments but little on online learning environments. Consequently, there were only a few studies on the impacts of class size on students' academic achievements in the online learning environment (Bettinger et al., 2017; Sorenson, 2014). This research was, therefore, designed to address this shortfall by focusing on the impacts of class size on online students' achievements and the cost of instruction.

Purpose of the Study

This research aimed to determine if and to what extent there was a significant difference between the academic achievements of online students in small and large classes, as measured by students' graduation rates within 4 years and by the instructional expenditures per student. This research also evaluated the tenability of Pritchard and Woollard's (2010) classroom dynamics and Blum's (2005) connectedness theories concerning online learning environments. The study was conducted utilizing publicly available archival academic data stored at The Education Trust

(n.d.). This website gathers information on various types of academic institutions. The higher education institutions on this website were considered Title-IV eligible and were located in the United States and its territories.

The following will discuss the study's theoretical frameworks, the study's focus, search methods employed, key terms used, criteria applied to include or exclude the literature sources for review, detailed discussions of the literature review, significance and rationale of the study, and a summary of the research findings.

Research Questions

RQ1: If and to what extent was there a difference between the academic achievements of online students in small and large classes as measured by the graduation rates within 4 years?

RQ2: If and to what extent was there a difference between the cost of instruction of online students in small and large classes as measured by the instructional expenditures per student?

Although not stated explicitly, the research question also attempted to address the potential influence of classroom dynamics (Pritchard & Woollard, 2010) and connectedness (Blum, 2005) theories concerning the impacts of class size on online students' outcomes.

Definitions of Key Terms

Academic achievements. Refer to the extent to which students have achieved their learning goals as evidenced in their graduation rates within 4 years. Kassaw and Demareva (2023) describe academic achievements as the progress students have registered in particular academic disciplines over a given period, generally over a semester or an academic year.

Class size. The number of students in a class at the end of a course, excluding those who withdrew before the end of a course. In this research, class size refers to the ratio of students to teachers in a regular classroom setting (Diette & Raghav, 2015).

Classroom dynamics theory. Classroom dynamics theory attributes observed students' academic improvements to the dynamics that exist in smaller classes (Pritchard & Woollard, 2010). In smaller classes, teachers had more time and resources to meet the learning needs of their students.

Connectedness theory. Blum (2005) discovered that connectedness helped students perform better. Connectedness in small classes included student-to-teacher, student-to-student, and teacher-to-parent relationships.

Graduation rate within 4 years. This refers to the percentage of new full-time students who started their courses in the fall of 2014 and completed their programs before August 31, 2020 (Education Trust, n.d.). This research used the graduation rate to measure online students' academic achievements.

Instructional expenditures per student. Represented the cost of instruction for full-time or equivalent students at the end of the 4-year academic programs in 2020 (Education Trust, n.d.).

Large class. In most cases in the literature review, large classes referred to classes with 22 or more students (Wilson, 2011). In this research, large class refers to a class with a student-to-teacher ratio of 13 or more.

Small class. In the literature review, this term referred to classes with 21 or fewer students (Wilson, 2011). However, in this research, small class size refers to classes with a student-to-teacher ratio of 12 or less.

Stakeholders. This term refers to organizations and individuals that have stakes in the affairs of educational institutions that benefit from the results of this research. This includes school administrators, instructors, academic institutions, parents, students, and accrediting institutions.

Chapter 2: Literature Review

This research aimed to assess the impacts of class size on students' academic achievements in the online learning environment. Class size research started in the early 1950s and continues to this day. Before discussing the literature review, it is essential to note the critical terms described in Chapter 1. In Chapter 2, the search methods employed and the inclusion and exclusion criteria used in the research will be described. In addition, the seminal research conducted on the impacts of class size on online students' academic achievements and the class-size studies conducted in and outside of the United States will be described as a background to the research. The research also examined the extent to which the various findings in the literature review were consistent with the theoretical frameworks for the research, namely, Pritchard and Woollard's (2010) theory of classroom dynamics and Blum's (2005) theory of connectedness.

The literature review was grouped into four categories to facilitate a better grasp of the various findings, namely, (a) class size impacting students' academic achievements, (b) class size partially impacting students' academic achievements, (c) class size not impacting students' academic achievements, and, finally, (d) contrary findings on the impacts of class size on students' academic achievements. The literature review will conclude by laying forward my thoughts on the significance and rationale for the research and providing a summary of Chapter 2.

Literature Search Methods

I employed the Abilene Christian University (ACU) One Search method to search scholarly, peer-reviewed journal articles, empirical articles, eBooks, essays, and more in ACU's Distance Learning Portal. In addition, I used other sources, such as ProQuest Dissertations and

Theses Global, Digital Commons, and Google Scholar. For the most part, the search focused on those peer-reviewed sources published since 2015 or the most recent 5 years. In addition, I employed Zotero software to scan, locate, download, and manage sources from various locations. Key terms searched included *academic achievements*, *class size*, *classroom dynamics theory*, *connectedness theory*, *graduation rate within 4 years*, *instructional expenditures per student*, *large class*, *small class*, and *stakeholders*.

Only sources that directly and, in some cases, indirectly addressed the issue of the impacts of class size on students' academic achievements were included in the literature review. In addition, only sources that revolved around the two proposed research questions were included. Sources that were deemed not relevant to the research were excluded.

Theoretical Framework Discussion

The Theory of Classroom Dynamics

One of the most important bases of any research work is having the appropriate conceptual frameworks as the research's foundation. As indicated in the introductory statements, I identified two conceptual frameworks from the literature review that deal with the potential impacts of class size on students' academic achievements. These two conceptual frameworks are discussed in the following sections.

The first conceptual framework refers to classroom dynamics. This conceptual framework states that the observed relationship between class size and students' academic achievements is due to the classroom dynamics in classroom learning environments (Pritchard & Woollard, 2010). Classroom dynamics is corroborated by Blum's (2005) theory of connectedness, discussed later, as a plausible reason for the observed relationship between class size and students' academic achievements. Pritchard and Woollard (2010) described classroom

dynamics theory as student-to-teacher dynamics. Pritchard and Woollard (2010) indicated that teachers assigned to small classes tended to have more time and resources to prepare their lesson plans than those teachers assigned to large classes. Students who were assigned to small classes registered improvements in their academic achievements. In small class environments, teachers spend less time on classroom management and more time on student instructional activities. So, smaller classes allowed teachers to contact and develop positive relationships with their students. These dynamics resulted in notable improvements in students' academic achievements (Pritchard & Woollard, 2010).

Blum's Theory of Connectedness

The second conceptual framework comes from the theory of connectedness propounded by Blum (2005). Blum's connectedness theory states that students who felt connected to their teachers and fellow students registered higher school attendance and better academic achievements.

Therefore, this research was designed to contribute to the existing knowledge base in the literature by drawing upon Pritchard and Woollard's (2010) classroom dynamics and Blum's (2005) connectedness theories as theoretical frameworks. I examined how the conceptual frameworks applied to online learning environments.

Seminal Research on Class Size and Students' Academic Achievements

Studies concerning the impacts of class size on students' academic achievements are not new, as indicated previously. Researchers have studied this phenomenon since the early 1950s, including Pritchard and Woollard's (2010) classroom dynamics theory and Blum's (2005) connectedness theory. The following paragraphs discuss some salient studies in the literature review on the impacts of class size on students' academic achievements.

Early Research on Class Size on Students' Academic Achievements

Research concerning the impacts of class size on students' academic achievements started in the 1950s when most studies indicated that small class sizes had favorable impacts on students' academic achievements. The favorable impacts were attributed to the better learning environments where instructors utilized better teaching methods and provided individualized attention to their students (Wilson, 2011). In 1979, Glass and Smith published a meta-analysis of 77 class-size studies on the impacts of class size on students' academic achievements. The meta-analysis indicated that most studies showed that small class sizes positively impacted students' academic achievements, particularly in classes with fewer than 20 students. The meta-analysis results were consistent with the classroom dynamics theories of Pritchard and Woollard (2010) and connectedness (Blum, 2005) concerning small class learning environments. A few seminal works on the relationship between class size and students' academic achievements in the United States and abroad are discussed in the following sections.

Class-Size Studies in the United States

Tennessee Student Teacher Achievement Ratio Program. One of the most essential Student Teacher Achievement Ratio (STAR) studies involved a sample of 11,000 participants, including elementary school students and their teachers, through a randomized longitudinal experiment. The study participants were randomly assigned to small classes of 15 students each and large classes of 23 students each (Chingos, 2013). STAR research showed that smaller classes (15–17 students) in kindergarten through third grade (K–3) provided short- and long-term benefits to students, teachers, and society. In addition, the study indicated a per-pupil effect of the Project STAR experiment was 0.048 standard deviation. Each one-student reduction in class size was related to an increase in student achievement of approximately 0.048 standard

deviations (Chingos, 2013; Jepsen & Rivkin, 2009). The results indicated that students in small classes performed better than those in large classes and were in sync with classroom dynamics and connectedness theories, as propounded by Pritchard and Woollard (2010) and Blum (2005).

Other by-products of the Project STAR research indicated that minority students performed much better academically than other groups during the earliest stages of the project's implementation. Although all students benefited somewhat, poor, minority, and male students registered extra benefits in terms of improved test scores, school engagement, increased grades, and reduced dropout rates (Mosteller, 1995).

California Class Size Reduction Program. Another seminal study on the impacts of class size on students' academic achievements was the California Class Size Reduction (CSR) program. The STAR project served as the impetus for the CSR program. In 1996, California adopted a CSR program by reducing class size from 30. The CSR program resulted in an increase in the number of teachers by 50%. Regarding students' academic achievements, the program increased by 0.006 standard deviations in third-grade reading scores and an increase of 0.01 standard deviation in mathematics scores (Rivkin et al., 2005). South Carolina, in 1998, and Florida, in 2002, followed suit by adopting the results of CSR programs in primary schools (Uhrain, 2016).

Other Types of Class-Size Studies Not Based on CSR Programs. Several types of class-size studies were conducted in several other states in the United States. A class-size study in Texas improved students' reading skills (Angrist & Lavy, 1999). A similar result was obtained in a study in California using a similar approach (Chingos, 2013). However, no improvements were noted in a class-size study conducted in Connecticut employing the approaches used in California and Texas (Hoxby, 2000).

Class-Size Studies Outside of the United States

CSR Initiatives in Ontario, Canada. Finally, during the 2007–2008 school year, Ontario, Canada, implemented a CSR in all its primary schools (Mascall & Leung, 2012). The initiative required all classes to have a maximum of 20 students per class. However, the new CSR initiative in Canada did not produce the anticipated results (Bascia & Faubert, 2012).

CSR Studies in Israel. Quasi-experimental or nonexperimental studies were conducted using the maximum class size rule or Maimonides rule, named after a 12th-century scholar (Jepsen, 2015). If a given class size exceeded 40, it was divided into two smaller classes. For instance, a class size of 42 would be divided into smaller classes of 21 students each. The results indicated that smaller classes were associated with significant improvements in students' academic achievements for fifth-grade students, but the effects were minor for fourth-grade students. Statistically, a one-student reduction in class size resulted in approximately 0.036 standard deviations for fifth grade and approximately 0.018 standard deviations for fourth-grade students (Krueger, 1999).

CSR Studies in Japan. A class-size study in Japan demonstrated that smaller classes were associated with higher academic achievements in fourth- and sixth-grade students, while there was no evidence of positive impacts for those students in the ninth grade (Jepsen, 2015).

CSR Studies in Europe. Most European class-size studies were based on the maximum class size or the Maimonides rule. In Sweden, a one-student reduction in class size in grades four to six was associated with improved test scores in mathematics and the Swedish language for 13- and 16-year-olds, with standard deviations of 0.023 and 0.033, respectively (Chingos, 2013). Minor positive impacts on class size on students' academic achievements were noted for both elementary and secondary grades in a study conducted in France. Finally, a class-size study

conducted in Denmark showed some benefits of reducing class size in terms of improved students' academic achievements or improved test scores (Gary-Bobo & Mahjoub, 2013).

CSR Studies in Developing Countries. Other class-size studies came from developing countries like Bolivia and Kenya. In Bolivia, the class-size studies indicated that students in smaller classes performed better academically (Urquiola, 2006). Likewise, a class-size study conducted in another developing country, Kenya, indicated that a CSR from 82 to 44 improved students' academic achievements. This was particularly true when contract teachers were used instead of regular teachers. This situation was caused by developing countries having issues with maintaining essential services, such as ensuring the availability of regular teachers at all times. Therefore, meaningful class-size studies were impossible in third-world countries where regular teachers were unavailable. In the Kenyan study, contract teachers demonstrated more commitment to their teaching jobs than regular teachers (Jepsen, 2015). Such scenarios highlighted the fundamental issues encountered by developing countries in their effort to improve the academic achievements of their students.

Most of the class-size studies conducted based on the STAR program indicated that students benefited more from smaller classes than larger ones. Again, the results of the various class-size studies are consistent with the concepts of classroom dynamics and connectedness theories as propounded by Pritchard and Woollard (2010) and Blum (2005), respectively.

Literature Review

The literature review indicated that several studies have been conducted on the impacts of class size on students' academic achievements. Most of the studies conducted indicated that class size directly impacted students' academic achievements in a wide variety of learning scenarios (Almulla, 2015; Diette & Raghav, 2015; Gaggero & Haile, 2020; Harfitt & Tsui, 2015;

Koniewski, 2013; Krassel & Heinesen, 2014; Matta et al., 2015; McDonald, 2013; Nandrup, 2016; Owuor, 2018; Sule, 2016; Uhrain, 2016; Wright et al., 2019). Some studies, such as Li and Konstantopoulos (2016), indicated that class size partially impacted students' academic achievements. Other studies indicated that class size did not impact students' academic achievements (Bettinger et al., 2017; Wilson, 2011). Finally, contrary to the results of most of the studies mentioned, some studies indicated that increased class size, as opposed to reduced class size, improved students' academic achievements (Blum, 2005; Denny & Oppedisano, 2013; McArver, 2015; Pritchard & Woollard, 2010). The following section will provide details of the mentioned studies and various categories of results.

Small Class Size Impacting Students' Academic Achievements

Almulla (2015) investigated whether class size impacted teachers' perceptions of their teaching effectiveness and various teaching methods. Participants included 30 teachers who taught smaller classes in two private schools and 37 who taught larger classes in two state schools in Alhafouf, Saudi Arabia. Questionnaires were sent out to 90 teachers to obtain adequate responses: 30 teachers from two public schools that taught small classes and 60 teachers who taught large classes from two state-owned schools. Ultimately, 67 teachers replied to the questionnaire: 30 from private and 37 from public schools.

The results of the study showed a strong relationship between class size and teaching methods that emphasized smaller classes. In larger classes, teachers more often preferred to utilize the lecture method rather than other teaching methods due to the unmanageable nature of larger classes. In addition, the study results showed that teachers in both small and large classes believed the size of their classes had some impact on the teaching methods they employed. The teachers in the larger classes indicated they needed to be more varied in the range of teaching

methods they would like to employ. Consequently, most of the teacher participants indicated they preferred to teach smaller classes of 15 to 20 students compared to teaching in larger classes containing more than 20 students. The study's results were consistent with the other findings that indicated the academic outcomes of students in small classes were better than those in large classes (Almulla, 2015). These results aligned with the concepts of classroom dynamics and connectedness theories propounded by Pritchard and Woollard (2010) and Blum (2005).

Diette and Raghav (2015) conducted a class-size study that involved a longitudinal study using grades earned by students between 1996 and 2008. In addition to academic data, the data gathered included demographic characteristics of the students in the sample. The results indicated a significant adverse effect on students' grades as class size increased. One interesting result of this study was that those students considered disadvantaged or vulnerable benefited more than other types of students. In addition, larger classes were detrimental to first-year students' grades or academic achievements, particularly on the verbal and math sections of their scholastic aptitude tests.

Gaggero and Haile (2020) conducted a class-size study using students' grades in a public university in the United Kingdom during the 2017–2018 academic year. The study was designed to look for evidence of a potential link between class size and students' postgraduate course grades. The examination noted a double-up class reduction policy where class size was split into two courses when the number of students per class exceeded 110, similar to the study conducted in Israel by Jepsen (2015). The examination was conducted using a sample of 987 course modules that consisted of a total of 7,976 course score observations. In addition, the data included demographic information, such as age, gender, and nationality, to assess the impacts, if any, of these endogenous factors on students' course scores. A regression discontinuity design

estimated the double-up class size reduction policy on students' course grades. The results indicated that large class sizes impacted course grades adversely, indicating that the class size reduction policy positively impacted students' course scores (Gaggero & Haile, 2020).

A study by Harfitt and Tsui (2015) examined the effects of class size on learning and teaching processes. Observations and interviews with students and teachers were used as the data for the study. The study was conducted in English language classes in secondary schools in Hong Kong. The data set included classroom observations and interviews conducted with public school students and teachers. Case studies were used to explore the mediating factors between class size and the level of student learning. Other research tools, such as field notes, observation schedules, videos, and audio, were used in the study. Verbal responses from observations were transcribed and analyzed. The results indicated that students in small classes performed better than those in large classes. The better performances in the smaller classes were attributed to better social factors prevalent in the smaller classes. It was also postulated that there was more harmony, absence of anxiety, and better social interactions among the students and between the students and their teachers in the smaller classes than was the case in the larger classes, according to the results of the study (Harfitt & Tsui, 2015). This finding is consistent with Blum's (2005) theory of connectedness, which states that the classroom dynamics between students and their teachers and among students would cause students in smaller classes to register better academic performances than their counterparts in larger classes.

Koniewski (2013) analyzed the impact of class size on students' academic achievements. A study conducted in 2006 by the Regional Examination Board in Cracow, Poland, was the data source used. The study was conducted in 28 schools that included 83 third-grade classes. The researcher collected a total of 1,757 questionnaires. In 1,733 cases, the questionnaire data were

matched with pupils' lower secondary school exam scores. The results were evaluated for internal validity. A regression model was used to analyze the results of the experiment. Results indicated that students from smaller classes with 23 or fewer students performed better than those with more than 23 students in each class. However, the study's results were not statistically significant (Koniewski, 2013).

Krassel and Heinesen (2014) analyzed the impacts of class size on students' academic achievements in a secondary school in Denmark. School enrollment data was obtained from the school's administration and the individual examination results for the ninth and 10th grades. The data were obtained from the Denmark Ministry of Education database. The data collected pertained to 2002 (school year 2001–2002). Class size was the variable of interest or independent variable and the outcome or dependent variable was the students' final grades. The study sample consisted of examination results for 46,267 students. Regression models and ordinary least squares (OLS) were used to tabulate and analyze the data obtained. The study results indicated that class size had beneficial impacts on students' academic achievements, and the impacts were statistically significant (Krassel & Heinesen, 2014).

Matta et al. (2015) studied the impacts of class size on students' academic achievements in a Hispanic-serving institution at New Mexico State University. The study was conducted over 7 years. The study was primarily designed to address the specific performance needs of Hispanic students and was studied using a one-semester introductory economics course at New Mexico State University. The sample for this study consisted of 1,141 students' academic records. The students were enrolled in 19 course sections of varying class sizes between 1994 and 2000. The class size during the study period ranged between 34 and 74. The average class size was 62 students per class, including those who withdrew from the classes. The class size ranged between

30 and 68, with an average class size of 55 students, excluding those who withdrew from the classes. The results of the study indicated that classes of more than 50 students in each class affected the performance of Hispanic and White students negatively. Namely, students' academic achievements deteriorated as class sizes increased (Matta et al., 2015).

In another study, McDonald (2013) reviewed the extant literature on the impacts of class size on learning and teaching and cited several studies that showed a statistically significant relationship between class size and student academic achievements. McDonald's (2013) study primarily focused on a meta-analysis of the extant literature to assess the impacts of class size on students' academic achievements.

Nandrup (2016) studied the effects of class size on students' academic achievements across grades two to eight in mathematics and reading in a compulsory school in Denmark. The data for the study consisted of registry data on all pupils in the Danish school system, and the students' test results were those maintained by The Danish Ministry of Children and Education. The results indicated that increasing class size in upper primary school (grade 6) decreased students' academic achievements.

A quantitative study using a parametric paired *t* test was conducted at an anonymous international higher education institution by Owuor (2018) to determine the impact of splitting a large class into two smaller classes on students' academic achievements. One of the challenges this study encountered was the definition of large and small classes. Even though the education institution where the study was conducted did not have a policy on class size, the two smaller classes used in the study consisted of 68 students each. The 68 students' marks (scores) were compared and analyzed before and after the split into two smaller classes. The study indicated a

significant positive relationship between class size and students' academic achievements (Owuor, 2018).

In an experimental study, Sule (2016) studied the effects of class size on students' academic achievements in mathematics in selected secondary schools in a West African country. The tools used in collecting data for the study included a researcher-made mathematics student questionnaire (MSQ) and a mathematics achievement test (MAT). A randomly selected sample of 150 senior secondary school students was employed in the study. A *t*-test analysis of the effect of class size on students' achievements in mathematics was used to analyze the results. The results indicated that students in smaller classes performed better than those in larger classes (Sule, 2016).

Uhrain (2016) examined the impacts of class size on secondary school students' academic achievements in English classes as measured by the students' final grades at the end of the courses. The participants for this study comprised students in five out of nine secondary schools in a South Carolina district. The study used a correlational design of 17,582 students' final grades from five secondary schools in the district. The data gathered was analyzed using a linear regression model. The results indicated that the null hypothesis was rejected, and class size had a significant impact on students' academic achievements in three out of the eight English classes, while class size did not impact students' academic achievements in the remaining five English classes. The results of three out of the eight English classes indicated that smaller class sizes resulted in better student academic achievements (Uhrain, 2016).

Wright et al. (2019) conducted a study to determine if students perceived improved learning experiences when class size decreased. The study was conducted at a large public research university in the midwestern part of the United States following a policy shift from a

previous large class of 25 students per course to a small class of 18 students per class. The study was conducted in introductory and intermediate-level World Language and European Language courses. The primary purpose of the class size policy shift was to enhance the quality of undergraduate education and improve the university's rankings in key indexes in the United States. The study was also designed to assess if students assigned higher ratings to instructors and courses in smaller classes than those instructors and courses in larger classes. The study comprised of 20 instructors selected to participate in a 60-minute focus group in which the instructors were interviewed about their intended and enacted pedagogical strategies to deal with smaller classes (Wright et al., 2019). The data from the interviews were collected, coded, and analyzed. Even though the study was not conducted to determine the impacts of class size on students' academic achievements, one of the by-products of this study was that students perceived smaller class environments more favorably than larger class environments. In other words, students perceived smaller classes positively impacting their academic performances (Wright et al., 2019).

The literature review discussed aligned with the results of the observations made by Pritchard and Woollard (2010), proponents of classroom dynamics theory, and Blum (2005), a proponent of connectedness theory. The following will discuss those research results that support the theory that smaller classes improve students' academic achievements partially, those results that indicate smaller class sizes do not impact students' academic achievements at all, and contrary findings, namely, those results that indicate larger classes, instead of smaller classes, improved students' academic achievements. However, these views of larger classes improving academic achievements were in the minority.

Class Size Partially Impacting Students' Academic Achievements

Li and Konstantopoulos (2016) examined the impacts of class size on students' academic achievements. This study was conducted in 2011 in 14 European countries using fourth-grade mathematics achievement scores. The students' achievement scores were obtained from an organization known as Trends in International Mathematics and Science Study (TIMSS). The number of students in each class was between 25 and 30. The independent variable was class size, while the dependent variable was students' scores in mathematics classes. A multiple-regression model was used to examine the effects of class size on student mathematics achievement scores. The study results indicated that class size effects were noted in two of the 14 European countries, confirming that class size partially impacts students' academic achievements. Romania and the Slovak Republic were the two countries where class size effects were noted. Class size effects were not noted in the other 12 European countries (Li & Konstantopoulos, 2016).

Class Size Not Impacting Students' Academic Achievements

Bettinger et al. (2017) conducted a large-scale experiment to determine the effects of online class size on students' academic achievements. This was one of a handful of studies conducted on online learning environments. The experiment was conducted in 2012 at DeVry University, one of the largest online universities in the United States, with approximately 80,000 students. The experiment included 100,000 student course enrollments in 4,000 classes across 111 different undergraduate and graduate courses over four consecutive academic semesters during the 2013–2014 academic year. Results indicated slight changes, such as 10%, in online college class size have no significant impact on online students' academic achievements (Bettinger et al., 2017).

Another study by Blatchford and Russell (2020) provided a different perspective on the impact of class size on students' academic achievements. The study indicated that judging class size effects simply by the strength of the association between class size and academic attainment is misleading and limited. Blatchford and Russell (2020) stated that class size affects not only students' academic achievements but also a wide array of key classroom processes, such as teaching, classroom management, peer relations, groups in the class, grading, and instructors' administrative activities. The researchers emphasized that the impact of class size should not be limited only to students' academic achievements but should also be extended to proximal classroom contexts, such as key classroom processes alluded to above. The primary finding of this study is that class size does not directly impact students' academic achievements.

A most recent study by Sanni et al. (2021) in West Africa examined the impact of class size on the learning outcomes of students in mathematics classes in junior secondary schools. The study's design was quasi-experimental and involved a sample of students and teachers from public schools who participated in the study. The methodologies used for the study included a mathematics achievement test (MAT), teacher interview, classroom observation, and video recording. Student's *t* test and ANOVA were used to analyze the quantitative data, while the qualitative data were analyzed using content analyses. The study's results were insignificant at the 5% level, indicating that students' mathematics grades were not dependent on class size (Sanni et al., 2021).

Shi (2019) examined the effects of class size and instructional technology on student learning performance using the researcher's personal teaching experience in an operations management (OM) course in a large urban public university between 2012 and 2016. All business majors were required to take the OM course. The study was designed to compare

students' performance between a regular class size of 30 students per class and a mega class size of approximately 100 students per class. The measure of student performance used was the grade point average (GPA) on a 4.0 scale. Students' GPAs in the OM course, along with personal profiles of students, were categorized and tallied in a Microsoft Excel spreadsheet for analysis. The difference between the mean GPA of the students in the regular class size was compared with the mean GPA of the students in the mega class size. A two-tailed *t* test indicated no statistically significant difference between the students in the regular class size and those in the mega class size (Shi, 2019).

Sorenson (2014) was also one of a handful of researchers who attempted to address the issue of the impact of online class size on students' academic achievements. However, the study did not directly examine the relationship between class size and students' academic achievements. Instead, Sorenson (2014) examined the relationship between online class size and instructor performance. Sorenson's nonexperimental study was conducted using a college of education peer review of part-time online instructors at a large for-profit university in the western part of the United States. The instructors' performances were evaluated based on a peer review rubric developed for this purpose. The sample consisted of 380 courses taught by part-time instructors: 217 undergraduate and 163 graduate courses. Descriptive statistics, Pearson correlation 148 coefficients, and linear regression were used to analyze the study results. Sorenson's (2014) study indicated that online class size had the most concerning relationship and potential influence on an instructor's ability to provide quality feedback to students and for the effective and consistent utilization of their teaching expertise (Sorenson, 2014). A Pearson correlation of -0.24 indicated a negative relationship between class size and instructor performance and the results were not statistically significant. In other words, there was no

significant difference between instructors' ability to teach smaller and larger classes (Sorenson, 2014).

In another study, Towner (2016) conducted a quasi-experimental study to assess the impacts of class size on academic achievements in introductory political science courses in small and large classes over two comparable semesters. The study was conducted at a public university in the midwestern part of the United States, where a class size of no more than 25 students was arranged in an introductory political science course. The small class section was then compared to the large class section taught in winter 2013. The large class section was capped at 85 students per class. Several alternative factors were controlled in each class section. For instance, the same instructor taught small- and large-class sections using the same syllabus, textbook, lectures, PowerPoint presentations, quizzes, and exams. In addition, the small and large classes were given in the same module in winter 2013 and 2014: Monday, Wednesday, and Friday from 12:00 to 1:07 pm. Results indicated that class size did not significantly influence student's grades. Instead, prior political science knowledge, ACT scores, and course attendance significantly and positively impacted students' academic achievements (Towner, 2016).

Wilson (2011) examined the relationship between class size and students' academic scores on citywide language arts and mathematics tests in two school districts in the New York area. Wilson's (2011) study examined the impacts of class size on students' academic outcomes in language arts and mathematics. The study was quantitative and employed a correlational design as its methodology. A convenient sample of 506 standardized test scores of third- and fifth-grade students from two school districts in the New York area was used. Wilson's study indicated a strong relationship between class size and academic scores in language arts and mathematics. However, the interesting finding was that there was no significant relationship

when other variables, such as gender, ethnicity, grade level, teacher experience, classroom type, and dollar amount spent for each student each year, were controlled (Wilson, 2011).

Contrary Findings on Impacts of Class Size on Students' Outcomes

Contrary to the results of most of the studies conducted so far, few studies indicated that large class sizes, instead of small class sizes, had a positive impact on students' academic achievements, as described in the following few paragraphs.

Alharbi and Stoet (2017) conducted a study to evaluate whether smaller classes led to higher academic achievements. The data for the study was obtained from the Programme for International Student Assessment (PISA) in 2012. The correlational study involved 478,120 15-year-old students in 63 nations. The results were analyzed using R's statistical software (R Development Core Team, 2014). Results indicated that smaller classes led to lower reading comprehension scores than larger classes, contrary to most studies that indicated smaller classes were more conducive to higher academic achievements.

Denny and Oppedisano (2013) estimated the marginal effect of class size on the educational attainment of high school students in the United States and the United Kingdom. The study concluded that increasing class size improved students' mathematics scores. However, only the United Kingdom study was statistically significant. The effects of large class sizes on students' academic achievements were more pronounced in the United Kingdom study than was the case in the study conducted in the United States (Denny & Oppedisano, 2013).

Lin et al. (2019) examined the relationship between class size and students' academic achievements in a high school online program. The high school was located in the midwestern part of the United States. The study data comprised 10,648 enrollment records during the 2013–2014 school year. The results indicated that increasing online class size positively impacted

students' academic achievements until the number of students reached 45, but a negative impact if the number increased beyond 45 (Lin et al., 2019).

McArver (2015) found that as class size increased, some students became more academically successful in their mathematics classes. McArver (2015) stated that teachers should not be concerned with the number of students in their classes but with how they can connect to students individually. In other words, how instructors connected to their students mattered most, not the class size determining success in academic classrooms. McArver (2015) examined the impacts of class size on students' scores in seventh-grade mathematics classes and ninth-grade Algebra I classes while controlling for gender, ethnicity, and socioeconomic status. The result indicated a statistically significant relationship between large class sizes and students' academic achievements.

Finally, Waddell (2017) examined the relationship between virtual school size and students' academic achievements. The study was designed to assess the degree of the relationship between virtual school size and students' academic achievements in virtual schools in reading, writing, and math in the southwestern part of the United States. Achievement was measured by students' test scores on the Texas Assessment of Knowledge and Skills (TAKS) Reading, Math, and Writing examinations. The results indicated that students enrolled in large schools demonstrated higher academic achievements on TAKS than those in small elementary schools. This finding was contrary to most previous studies, which showed that students in smaller classes performed better than those in large classes (Waddell, 2017).

The literature reviewed thus far included studies conducted in various academic disciplines, including online learning environments. The studies reviewed in the literature comprised of studies conducted in private schools (Almulla, 2015; Diette & Raghav, 2015),

public schools (Almulla, 2015; Shi, 2019), special purpose education institutions (Matta et al, 2015), elementary schools (Koniewski, 2013; Nandrup, 2016; Wilson, 2011), secondary schools (Krassel & Heinesen, 2014; Sule, 2016), and colleges and universities (Diette & Raghav, 2015; Matta et al., 2015). In addition, few studies were conducted in online college learning environments (Bettinger et al., 2017; Sorenson, 2014).

Based on the literature review, the primary focus of the studies conducted so far was on class size, while the academic outcomes studied were end-of-course grades and surveys. Most of the research in the literature review was conducted through traditional face-to-face learning contexts, while a few were conducted through online delivery modalities. The methodologies employed in the various studies discussed in the literature review were surveys and questionnaires. Despite the various environments, such as private, public, and special purpose institutions, various geographical locations, and both traditional face-to-face and online delivery modalities, the primary focus of the studies discussed in the literature reviewed was determining the impacts of class size on students' academic achievements. The literature review measured students' academic achievements using end-of-course grades and end-of-course surveys. This research measures students' academic achievements by the graduation rates within 4 years. Finally, the studies discussed in the literature review comprised various courses, such as English, language arts, business education, operations management, political science, economics, mathematics, reading, and writing. In this research, the focus was not on a specific academic discipline but, collectively, on the graduation rates within 4 years.

Therefore, the conflicting results of the various studies conducted thus far and the lack of studies in online learning environments underscored the need for more research to provide a clearer direction in addressing the issues related to the impacts of class size on students'

academic achievements. Therefore, this research was designed to contribute to the existing knowledge base by examining the potential impacts of class size on students' graduation rates within 4 years and instructional expenditures per student.

Significance and Rationale for the Study

If the issue of the potential impact of class size on students' achievements continues unabated, academic institutions could be impacted negatively in several ways. First, academic institutions, as organizations, may need to accomplish their academic missions, objectives, and goals of producing educated persons in society. It is impossible to accomplish such goals in academic environments where the impacts of class size on students' achievements remain unresolved. Second, it is difficult for academic institutions to maintain their academic reputation and accreditation status in good standing if they do not continue to offer quality education to their students. To maintain their reputation and accreditation status, academic institutions must provide quality education by adopting the optimum class size. Finally, if academic institutions do not succeed in providing quality education by adopting the optimum class size, future student enrollment could decline. Consequently, declining enrollments could lead to declining institutional revenues. Hence, addressing the issue of the impacts of class size on students' academic achievements through additional research is imperative and will also have important implications for those institutions that would like to venture into the new and emerging online academic environments.

Chapter Summary

As is evident in the literature review discussions, the impact of class size on students' academic achievements is not a settled issue. According to the literature review, there are four categories of results. The first category of results indicated that small class size improved

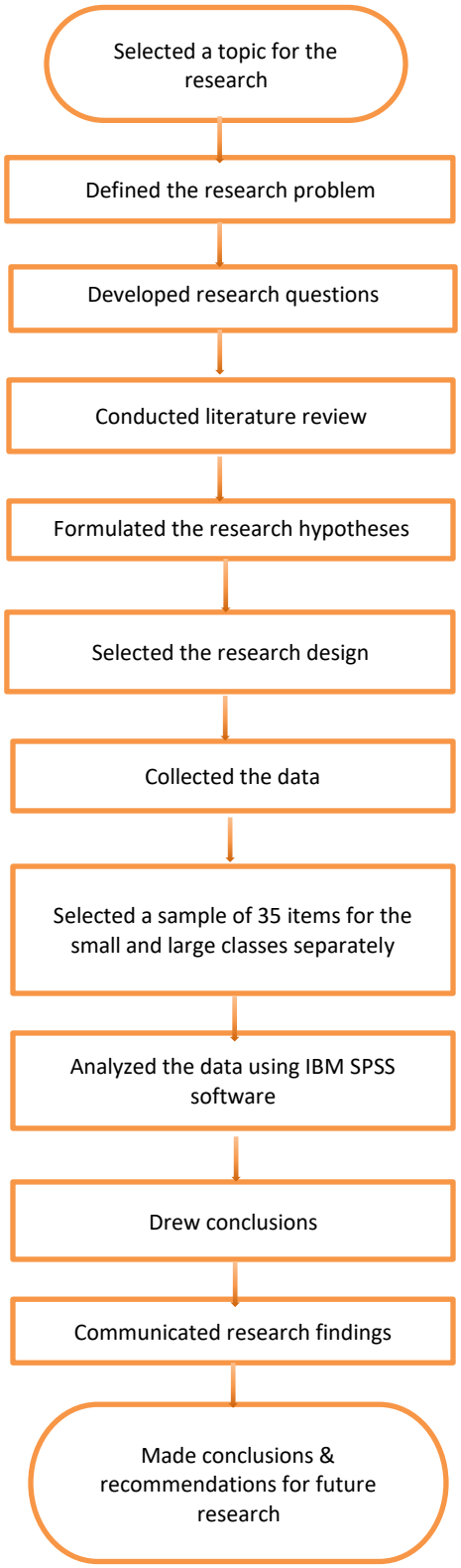
students' academic achievements (Almulla, 2015; Diette & Raghav, 2015; Harfitt & Tsui, 2015; Koniewski, 2013; Krassel & Heinesen, 2014; Matta et al., 2015; McDonald, 2013; Nandrup, 2016; Owuor, 2018; Uhrain, 2016; Wright et al., 2019). The first category of results described is consistent with Pritchard and Woollard's (2010) classroom dynamics theory and Blum's (2005) connectedness theory. The second category of results indicated that class size partially impacted students' academic achievements (Li & Konstantopoulos, 2016). The third category of results indicated no relationship between class size and students' academic achievements (Bettinger et al., 2017; Towner, 2016; Wilson, 2011). Finally, the fourth category of results indicated alternative views (contrary findings) on the impacts of class size on students' academic achievements (Denny & Oppedisano, 2013; Lin et al., 2019; & McArver, 2015). Such a lack of cohesive results highlighted the need for further studies on the impacts of class size on students' academic achievements. Chapter 3 will detail the methodology and design employed in the research.

Chapter 3: Research Method

This research was designed to determine if and to what extent there was a statistically significant difference between the academic achievements of online students in small and large classes as measured by the students' graduation rates within 4 years and the cost of instruction as measured by the instructional expenditures per student. The methodology for the research was also designed to determine the tenability of the conceptual frameworks for this research, namely, Pritchard and Woollard's (2010) classroom dynamics theory and Blum's (2005) connectedness theory. Figure 1 depicts the processes employed in this research.

Figure 1

The Research Process Flowchart



Accordingly, this research was intended to contribute to the knowledge base and scholarly conversations on the differences in students' academic achievements between small and large classes in line with recommendations made by previous researchers, such as Wright et al. (2019) and others. The following information describes the methodology employed, including the research design, population for the study, sample selection procedures, archival data collection and analysis procedures, ethical considerations, trustworthiness of the publicly available archival data used in this research, assumptions, limitations, and delimitations. The chapter concludes with a summary of the methodology chapter.

As indicated earlier, addressing the issues related to the impacts of class size on students' academic achievements as measured by the graduation rates within 4 years is imperative for institutions directly impacted by the issue of class size and students' academic achievements. The administration of the affected institutions, including their operating budgets, classroom management, and staffing levels, all depend on the optimum class size. As a result of this research, understanding the optimum class size meets the needs of academic administrators in maintaining the appropriate class size and meeting the basic requirements of accrediting agencies. The research was designed to answer the following questions:

RQ1: If and to what extent was there a difference between the academic achievements of online students in small and large classes as measured by the graduation rates within 4 years?

RQ2: If and to what extent was there a difference between the cost of instruction of online students in small and large classes as measured by the instructional expenditures per student?

The study involved testing the four hypotheses to determine if and to what extent there was a statistically significant difference between the academic achievements of online students in

small and large classes as measured by the graduation rates within 4 years and the cost of instruction as measured by the instructional expenditures per student. The hypotheses were as follows:

$H_0$1: There was no significant difference between the academic achievements of online students in small and large classes as measured by the graduation rates within 4 years.

H_a1: There was a statistically significant difference between the academic achievements of online students in small and large classes as measured by the graduation rates within 4 years.

$H_0$2: There was no significant difference between the cost of instruction of online students in small and large classes as measured by the instructional expenditures per student.

H_a2: There was a statistically significant difference between the cost of instruction for online students in small and large classes as measured by the instructional expenditures per student.

Research Design and Methodology

The research employed an ex post facto comparative design using publicly available academic archival records that included class size, graduation rate within 4 years, and instructional expenditures per student. This research design represented the appropriate approach because, in this type of comparative research, the researcher was investigating a research question after the effects had already occurred (Terrill, 2016).

Population

The data needed for the research was obtained from The Education Trust (n.d.). This website gathers information on public, private for-profit, private not-for-profit, degree-granting, 4-year, and higher education institutions eligible for Title IV in the United States and associated territories. The institutional graduation rates presented in The Education Trust (n.d.) were owned

by the U.S. Department of Education's National Center for Education Statistics (NCES) and collected through a centralized higher education data collection process called the Integrated Postsecondary Education Data System (IPEDS). IPEDS consisted of a series of surveys through which institutions provided data about themselves on various topics. The graduation rates on The Education Trust (n.d.) were based on the graduation rates (GR) survey obtained during the 2014 to 2020 academic years.

The data comprised 2,846 higher education institutions listed at The Education Trust (n.d.), 209 of which offered 100% online education, constituting the total population for the research (see Appendix A). The data consisted of class size (student-to-teacher ratio), graduation rates within 4 years, and institutional expenditures per student for the list of 209 online institutions for the period between 2014 and 2020.

Class Size and Graduation Rates Within 4 Years

Eighty-nine out of the 209 online institutions, with "no data" for class size, teacher-to-student ratio, or graduation rates within 4 years, were excluded from the population, resulting in 120 online institutions that constituted the actual population for the research (see Appendix B). The list of the 120 online institutions was divided into two groups, namely, a small class group of 57 items (those with student-to-teacher ratios of 12 or less; see Appendix C) and a large class group of 63 items (those with student-to-teacher ratios of 13 or more; see Appendix D).

Class Size and Instructional Expenditure Per Student

Regarding the second research question concerning the impacts of class size on institutional expenditures per student, only nine out of the 209 online institutions did not have the requisite data. The nine online institutions with "no data" for class size or teacher-to-student ratio or instructional expenditures per student were excluded from the total population of 209 online

institutions (see Appendix E and Appendix F). The remaining 200 online institutions constituted the actual population for the research. The list of the 200 online institutions was divided into two groups, namely, a small class group of 99 items (those with student-to-teacher ratios of 12 or less; see Appendix G) and a large class group of 101 items (those with student-to-teacher ratios of 13 or more; see Appendix H).

Research Sample

Class Size and Graduation Rates Within 4 Years

As described in the previous paragraph, 120 items were identified as the research population, of which 57 represented the small class group and 63 represented the large class group. The small and large classes were placed in two different Microsoft Excel spreadsheets for sampling (see Appendix C & Appendix D).

The small class list in the Microsoft Excel spreadsheet was numbered 1 through 57, with 57 being the total number of institutions in the small class group. For analysis, a random sample of 35 items was selected from the small class group of 57 institutions. The Microsoft sample selection function generated 12 duplicate items: Sample item numbers 7(21), 15(50), 19(3), 20(43), 22(12), 23(13), 24(2), 28(31), 29(4), 31(5), 32(51), and 34(32). Each duplicate item was replaced by the following available number on the list, shown in brackets next to each duplicate item (see Appendix I).

Likewise, the large class group in the Microsoft Excel spreadsheet was numbered 1 through 63, with 63 being the total number of institutions in the large class group. A random sample of 35 items was selected from the large class group for analysis. The Microsoft sample selection function generated seven duplicate items: Sample item numbers 10(53), 11(8), 20(12),

23(10), 27(54), 31(15), and 33(46). Each duplicate item was replaced by the following available number on the list, which is shown in brackets next to each duplicate item (see Appendix J).

Class Size and Instructional Expenditures Per Student

As described previously, the second research question concerned the impacts of class size on instructional expenditures per student. Two hundred items were identified as the total population for the research, of which 99 items represented the small class group and 101 items represented the large class group. The small and large class groups were placed in two different Microsoft Excel spreadsheets for sampling (see Appendix K and Appendix L).

The list of the small class groups in the Microsoft Excel spreadsheet was numbered 1 through 99, with 99 being the total number of institutions in the small class group. A random sample of 35 items was selected from the small class group of 99 items for analysis. The Microsoft sample selection function generated three duplicate items: Sample item numbers 23(65), 31(60), and 35(76). Each duplicate item was replaced by the following available number on the list, which is shown in brackets next to each duplicate item (see Appendix K).

Likewise, the large class group in the Microsoft Excel spreadsheet was numbered 1 through 101, with 101 being the total number of institutions in the large class group. A random sample of 35 items was selected from the large class group for analysis. The Microsoft sample selection function generated six duplicate items: Sample item numbers 16(59), 19(2), 20(100), 22(69), 26(39), and 35(48). Each duplicate item was replaced by the following available number on the list, shown in brackets next to each duplicate item (see Appendix L).

Definitions of Small and Large Classes

Concerning the definition of a small and large class, I scanned the extant literature for the definitions of a small and a large class. The definitions of small and large classes varied in the

literature review. Lin et al. (2019) considered those classes with less than 45 undergraduate students in a traditional classroom as small and those with more than 45 undergraduate students as large. Koniewski (2013) described small classes as those with less than 23 students and large classes as those with more than 23 students. Matta et al. (2015) defined a small class as 50 or less and a large class as 50 or more students. On the other hand, Sorenson (2014), who investigated online classes, categorized class sizes into three groups: small = classes with 10 students or less, medium = classes with 11 to 19 students, and large = classes with 20 to 30 students. Based on the list of 209 online institutions for this research, a small class was defined as one with a class size (student-to-teacher ratio) of 12 or less. A large class was defined as one with a class size (student-to-teacher ratio) of 13 or more. The number 13 was selected as the cut-off point between small and large classes because it represented the median of the list of 209 online institutions.

Materials and Instruments

No materials or instruments were used in this research besides the list of archival data of all online higher education institutions available at The Education Trust (n.d.) website for the 2014 to 2020 academic years.

Data Collection and Analysis Procedures

The data collection procedures have already been described in detail in previous paragraphs. The data analyses were performed using the most recent version of the IBM SPSS Statistics software. Concerning the data analysis procedures, the appropriate test to determine the difference between two groups that consisted of two independent samples with continuous dependent variables and nonparametric data was the nonparametric alternative to the independent-samples *t* test, the Mann–Whitney U test. Two groups of samples were considered

independent if the two groups of samples were unrelated and each item in the sample was used only once (Salkind, 2017).

The Mann–Whitney U test was employed because the following four assumptions were met: (a) there was one dependent variable or outcome measure that was continuous; (b) there was one independent variable with two categorical, independent groups; (c) observations were independent, and there were no relationships among the observations within each group as well as between the two groups themselves; and, finally, (d) it was determined the distribution of the scores between the two categories in the independent variable had the same or different shapes. This last assumption is considered critical because it entailed important implications for interpreting the results of the Mann–Whitney U test (Laerd Statistics, n.d.).

The shapes of the data distributions of the two samples were used to determine if the median or the mean ranks would be used to compare the two samples. The mean ranks were used to compare the two samples because the shapes of the data distributions were not identical. The mean ranks of the graduation rate within 4 years of the small class group sample were compared to the mean ranks of the graduation rates within 4 years of the large class group sample to assess if there was a statistically significant difference between the mean ranks of the graduation rates within 4 years of the two samples using the Mann–Whitley U test. The Mann–Whitley U test was calculated to determine if the observed differences between the means ranks of the two groups were statistically significant. A statistically significant difference between the two group mean ranks indicated that there was indeed a significant difference between the mean ranks of the graduation rates within 4 years between the small and large classes (see Table 1).

Table 1

Nonparametric Tests: Hypothesis Test Summary

Null Hypothesis	Test	Sig. [a,b]	Decision
The distribution of Graduation Rate is the same across Class Size categories	Independent-Samples Mann–Whitney U Test	.041	Reject the null hypothesis

Note. (a). The significance level is .050. (b). Asymptotic significance is displayed.

After determining if and to what extent a significant difference existed between the mean ranks of the two groups, the eta squared effect size was computed to determine the magnitude of the difference between the two mean ranks. Eta squared effect size is normally used to determine the magnitude of the difference between the two groups' mean ranks. Eta squared was the appropriate effect size measure for comparing the observed mean ranks between the two groups. An eta squared effect size of < 0.01 indicates a negligible eta squared effect size, < 0.06 indicates a small eta squared effect size, < 0.14 indicates a medium eta squared effect size, and > 0.14 indicates a large eta squared effect size. These results here were designed to answer the first research question, RQ1.

The procedures were repeated to determine if there were significant differences between the mean ranks of the instructional expenditures per student of the small class group and the median instructional expenditures per student of the large class group. This test was designed to answer the second research question, RQ2.

Ethical Considerations

Family Educational Rights and Privacy Act of 1974

According to the Family Educational Rights and Privacy Act (FERPA; 1974), this research was exempt from the institutional review board (IRB) because the research was based on publicly available archival data and did not involve human participants. However, I submitted

an IRB form explaining why I did not think IRB approval was needed in this case. The publicly available archival data did not involve personally identifiable information. According to FERPA (1974), data collected in this manner was exempt from IRB review and did not require informed consent from The Education Trust (n.d.), the data source for the publicly available data.

As indicated, the methodology section of this research did not need approval from the publicly available data source from the IRB because the research involved neither human research participants nor required informed consent since there were no human participants. Nevertheless, the proposal was sent to the IRB for approval before proceeding with the research as part of the institutional compliance procedures. Consequently, the institutional IRB approved the research proposal (see Appendix P).

Trustworthiness and Reliability of Archival Data

Terrill (2016) underscored the importance of validating data collection instruments before using them in research. Along that line, the trustworthiness of the archival data was evaluated when the information was gathered from the publicly available archival database after securing approval from the IRB.

Assumptions

The basic assumption of class size impacting students' academic achievements, more specifically, graduation rates within 4 years, was derived from several researchers' studies. Two such studies are described. A study conducted by Diette and Raghav (2015) represented a longitudinal study between 1996 and 2008. The study was conducted in a private liberal arts college environment, and the results showed that students' grades decreased as class size increased. A study by Harfitt and Tsui (2015) showed that students in smaller classes performed better academically than those in larger classes. This result was attributed to better social factors

noted in the smaller classes. The study also postulated more harmony, less anxiety, better peer relations, closer relationships with teachers, and more cooperation among members in the smaller classes (Harfitt & Tsui, 2015). The results were tested for internal validity, and a regression model was used to analyze the experiment results. The study results indicated that pupils from classes with class sizes below 23 achieved higher mean scores than their peers in classes higher than 23 by 0.039 standard deviations in science classes but not humanities classes. The results of these types of studies reinforced the assumption that class size impacted students' academic achievements.

Limitations

The study's main limitation was that it was based on a small sample from publicly available archival data, and results based on such a small sample cannot be extrapolated to the total population of all online accounting students everywhere.

Delimitations

Because the study was conducted on a small population of academic data, its results might be less representative than those of much larger academic data. In addition, because the study was nonexperimental, all extraneous factors that could affect the study's results might not have been accounted for in the research. Therefore, future research involving a larger population of academic data and samples may be appropriate.

Chapter Summary

This chapter detailed the methodology employed in this research, such as the research design, population for the study, sample selection procedures, data collection and analysis procedures, ethical considerations, trustworthiness of the data gathered, assumptions, limitations, and delimitation of the research. Chapter 4 provides detailed descriptions of the research results.

Chapter 4: Results

The previous three chapters described the background of the research, the literature review, and the research methodology performed. Chapter 4 discusses the results of the Mann–Whitney U test conducted, the descriptions of the statistics involved, the answers to the two research questions, and whether or not the related research hypotheses were accepted or rejected based on the test results. This chapter explains how class size impacts the graduation rates within 4 years and the instructional expenditures per student. Chapter 4 concludes by summarizing the statistical test results. The chapter also answers the two research questions stated in Chapter 2.

RQ1: If and to what extent was there a difference between the academic achievements of online students in small and large classes as measured by the graduation rates within 4 years?

The research also involved evaluating the following two hypotheses:

$H_0$1: There was no significant difference between the academic achievements of online students in small and large classes as measured by the graduation rates within 4 years.

H_a1: There was a statistically significant difference between the academic achievements of online students in small and large classes as measured by the graduation rates within 4 years.

Research Question 1 Results

A Mann–Whitney U test was conducted to determine whether graduation rates differed within 4 years between small and large classes. Distributions of the graduation rate within 4 years between small and large classes were not similar, as assessed by visual inspection (see Figure 2). The difference between the mean ranks of the graduation rates within 4 years between small and large classes was statistically significant, $U = 439$, $z = -2.039$, $p = .041$ (see Table 2), using an exact sampling distribution for U with a medium squared effect size of 0.059 (Dinneen & Blakesley, 1973; Lenhard & Lenhard, 2022) suggesting a moderate level of practicality to

real-life academic scenarios. Accordingly, the null hypothesis, $H_0 1$, was rejected, and the alternative hypothesis, $H_a 1$, was accepted (see Table 1).

Figure 2

Frequency Distribution: Graduation Rate by Class Size

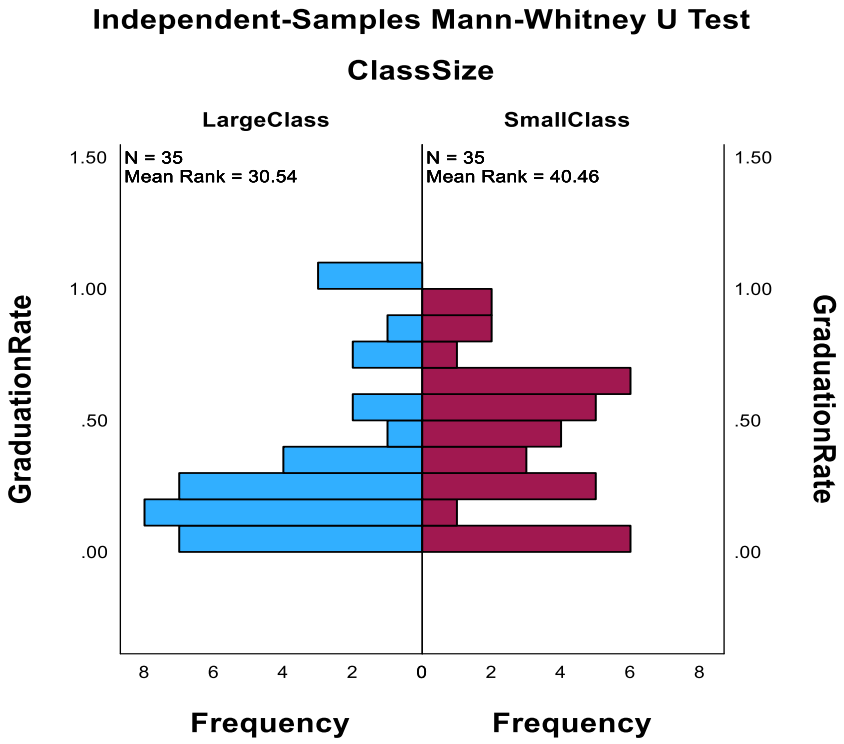


Table 2

Independent-Samples Mann–Whitney U Test Summary: Graduation Rate Across Class Size

Total N	70
Mann–Whitney U	439.000
Wilcoxon W	1069.000
Test Statistic	439.000
Standard Error	85.100
Standardized Test Statistic	-2.039
Asymptotic Sig. (2-sided test)	.041

Within the Mann–Whitney U test context, an eta squared effect size less than 0.01 is considered negligible, between 0.01 and 0.06 is considered medium, and between 0.06 and 0.14 is considered medium, and greater than 0.14 is considered significant. Consequently, this study's eta squared effect size of 0.059 (Lenhard & Lenhard, 2022) is considered medium, again indicating a moderate level of practical applications to real-life academic scenarios.

RQ2: If and to what extent was there a difference between the cost of instruction of online students in small and large classes as measured by the instructional expenditures per student?

$H_0$2: There was no significant difference between the cost of instruction of online students in small and large classes as measured by the instructional expenditures per student.

H_a2: There was a statistically significant difference between the cost of instruction for online students in small and large classes as measured by the instructional expenditures per student.

Research Question 2 Results

A Mann–Whitney U test was conducted to determine if there was a difference in the instructional expenditures per student between small and large classes. Distributions of the instructional expenditures per student between small and large classes were not similar as assessed by visual inspection (see Figure 3). The difference between the mean ranks of instructional expenditures per student between small and large classes was statistically significant, $U = 117$, $z = -5.820$, $p < .001$ (see Table 3), using an asymptotic sampling distribution for U with a large eta squared effect size of 0.49 (Dinneen & Blakesley, 1973; Lenhard & Lenhard, 2022) suggesting a robust level of practicality to real-life academic

scenarios. Accordingly, the null hypothesis, $H_0 2$, was rejected, and the alternative hypothesis, $H_a 2$, was accepted (see Table 4).

Figure 3

Frequency Distribution: Expenditure Per Student by Class Size

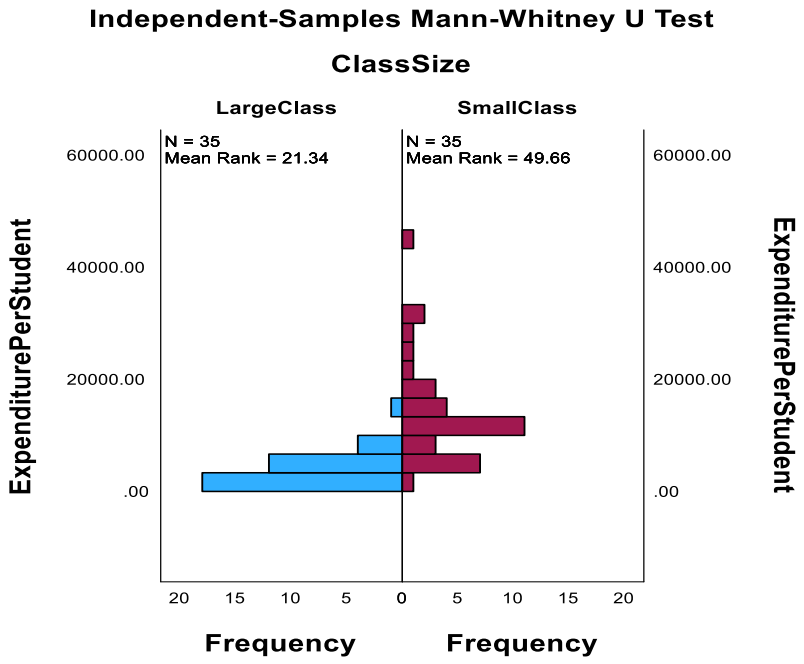


Table 3

Independent-Samples Mann–Whitney U Test Summary: Expenditure Per Student Across Class Size

Total N	70
Mann–Whitney U	117.000
Wilcoxon W	747.000
Test Statistic	117.000
Standard Error	85.134
Standardized Test Statistic	-5.820
Asymptotic Sig. (2-sided test)	< .001

Table 4

Nonparametric Tests: Hypothesis Test Summary

Null Hypothesis	Test	Sig. [a,b]	Decision
The distribution of Graduation Rate is the same across Class Size categories	Independent-Samples Mann–Whitney U Test	< .001	Reject the null hypothesis

Note. (a). The significance level is .050. (b). Asymptotic significance is displayed.

Chapter Summary

Chapter 4 discussed the research results regarding the two research questions and the four hypotheses—the null and the alternative hypotheses. The results of the Mann–Whitney U test resulted in the rejection of the null hypotheses, $H_0$1 and $H_0$2, related to the two research questions. There was a medium eta squared effect size on the impact of class size on graduation rates within 4 years, while a large eta squared effect size was noted on the impact of class size on instructional expenditures per student. Chapter 5 discusses the findings, implications of results for practical applications, limitations and delimitations, and concludes with recommendations for further research.

Chapter 5: Discussions, Recommendations, and Conclusions

The primary purpose of this research was to determine the impacts of class size on online students' academic achievements as measured by the graduation rates within 4 years and on the impacts of class size on the cost of instruction as measured by the instructional expenditures per student. In the literature review, class size was defined primarily as the number of students per class at the end of a course, excluding those students who withdrew before the end of the course (Diette & Raghav, 2015). However, in this research, the student-to-teacher ratio was used to represent class size because the two terms are interchangeable, and the online data at The Education Trust (n.d.) was referred to as the student-to-teacher ratio, which was the same as class size. Likewise, graduation rates within 4 years were used instead of end-of-course grades, as used in the literature review, to represent online students' academic achievements. It is also important to note that the data used in this research were compiled at the institutional level. In contrast, the class size and students' academic achievements discussed in the literature review were compiled at individual classroom levels.

Chapter 5 also discusses the research results within the contexts of the two theoretical frameworks, Pritchard and Woollard's (2010) classroom dynamics theory and Blum's (2005) connectedness theory, and from the contexts of the findings discussed in the literature review. The chapter also includes interpretations of the results of the research within the context of the review of the existing literature, the implications of the findings for practice, limitations and delimitations of the research results, and recommendations for future research on the impacts of class size on online students' academic achievements. The chapter summarizes the important findings and the potential benefits of the findings to stakeholders.

Research Questions

The research questions addressed were as follows:

RQ1: If and to what extent was there a difference between the academic achievements of online students in small and large classes as measured by the graduation rates within 4 years?

RQ2: If and to what extent was there a difference between the cost of instruction of online students in small and large classes as measured by the instructional expenditures per student?

To answer the two research questions, an ex post facto comparative design, using publicly available academic archival records that included a student-to-teacher ratio (class size), graduation rate within 4 years, and instructional expenditure per student, was employed in the research. According to Terrill (2016), the research design employed in this research was appropriate because, in this type of comparative research, I was investigating a research question after the effects had already occurred.

Impacts of Class Size on Graduation Rates Within 4 Years

Of the 2,846 higher education institutions listed at The Education Trust (n.d.), 209 offered 100% online education, constituting the total population used in this research (see Appendix A). The data consisted of a student-to-teacher ratio (class size), graduation rates within 4 years, and institutional expenditures per student for the list of 209 online institutions for the period between 2014 and 2020.

One hundred twenty online institutions were used in the research after excluding 89 online institutions with “no data” for teacher-to-student ratio (class size) or graduation rates within 4 years (see Appendix B). The list of the 120 online institutions was then divided into two groups: a small class group of 57 items, those with a student-to-teacher ratio of 12 or less (see

Appendix C), and a large class group of 63 items (those with a student-to-teacher ratio of 13 or more (see Appendix D). A sample of 35 items was selected from the small class group of 57 items, and another sample of 35 items was selected from the large class group of 63 items for analysis. The sample items were then compared and analyzed using SPSS Statistics software, as was described in the methodology section in Chapter 4. The Mann–Whitney U test indicated that the difference between the mean ranks of the graduation rates within 4 years between small and large classes was statistically significant, $U = 439$, $z = -2.039$, $p = .041$ (see Table 2), using an exact sampling distribution for U (Dinneen & Blakesley, 1973) with a medium eta squared effect size of 0.059. In other words, there was a statistically significant difference between the academic performance (graduation rates within 4 years) of students in the small class and the large class groups, with the small class group performing significantly better than those in the large class group.

Discussion of Findings Within the Context of the Two Theoretical Frameworks

The results of this research attested to the tenability of the two theoretical frameworks, namely, Pritchard and Woollard's (2010) classroom dynamics and Blum's (2005) connectedness theories, concerning small class environments improving students' academic performances. According to these two theoretical frameworks, small class learning environments were conducive to improved academic performances, as was evident in the research results.

Pritchard and Woollard's (2010) classroom dynamics theory attributes academic improvements in small class environments to classroom dynamics, such as the relationships between students and teachers, students to students, and between teachers and student parents. Pritchard and Woollard's classroom dynamics theory further stated that small class sizes enable

teachers to spend less on classroom management and more on instructional activities, improving students' academic performance.

Blum's (2005) connectedness theory also attributed students' improved academic performances to smaller class learning environments. The assumption here was that students in smaller classes felt more connected to their fellow students and teachers than did students in larger classes. Blum defined connectedness as how well students believed they were cared for academically and individually. Blum (2005) also discovered that as students' sense of connectedness increased, so did the students' academic achievements.

Discussion of Findings in Relation to Past Literature

The research results concerning small class environments improving students' academic performances were consistent with the two theoretical frameworks previously discussed and with most of the findings in the literature review, which were discussed in the following few paragraphs. The discussions included only those research results that indicated small classes improved students' academic performances and those that partially confirmed such research results.

Among those that supported small class learning environments improved students' academic performances were Almulla (2015), Diette and Raghav (2015), Gaggero and Haile (2020), Harfitt and Tsui (2015), Koniewski (2013), Matta et al. (2015), McDonald (2013), Nandrup (2016), Owuor (2018), Sule (2016), Uhrain (2016), and Wright et al. (2019), which are discussed in greater detail in the following pages.

Almulla (2015) investigated teachers' perceptions of the impacts of class size on the effectiveness of their teaching methodology. The research aimed to determine the impact of class size on students' academic performances. The study did not directly investigate the impacts of

class size on students' academic performances. Instead, Almulla (2015) investigated teachers' perceptions of the effects of class size on their teaching effectiveness. Participants included 30 teachers who taught small classes in two private schools and 37 who taught larger classes in two state schools in Alhafouf, Saudi Arabia. Questionnaires were sent out to the teachers to assess their perceptions. The study's results indicated a strong relationship between class size and teaching methods emphasizing smaller classes. Consequently, most of the teacher participants indicated their preference for teaching smaller classes of 15 to 20 students compared to teaching larger classes with more than 20 students in each class (Almulla, 2015).

Diette and Raghav (2015) conducted a class-size study that involved a longitudinal study using grades earned by students between 1996 and 2008. The study aimed to examine the relationship between class size and student achievement. In addition to academic data, the data gathered included demographic characteristics of the students in the sample. A linear regression analysis was performed using the grades collected from the students. The results indicated a significant adverse effect on students' grades as class size increased (Diette & Raghav, 2015). An interesting by-product of the study was that those students considered disadvantaged or vulnerable benefited more than other types of students in the smaller classes.

Another study by Gaggero and Haile (2020) was conducted to assess the impacts of class size reduction policy on students' grades. This study used students' grades in a public university in the United Kingdom during the 2017–2018 academic year. The study sought evidence of a potential link between class size and students' postgraduate course grades. The examination noted a double-up class reduction policy where class size was split into two courses when the number of students per class exceeded 110, similar to the study conducted in Israel by Jepsen (2015). The examination was conducted using a sample of 987 course modules that consisted of

a total of 7,976 course score observations along with students' demographic information. A regression discontinuity design estimated the double-up class size reduction policy on students' course grades. The results indicated that large class sizes impacted course grades adversely while indicating that the class size reduction policy positively impacted students' course scores (Gaggero & Haile, 2020).

The three studies were discussed to describe some of the majority of studies in the literature review that support the overall finding that smaller classes positively impact students' academic achievements. Other studies were also conducted using various methodologies, academic disciplines, and geographic locations.

Using Various Methodologies

The various methodologies used included archival records (Diette & Raghav, 2015; Matta et al., 2015; Nandrup, 2016), correlational research (Almulla, 2015; Gaggero & Haile, 2020; Uhrain, 2016); experimental research (Koniewski, 2013; Owuor, 2018; Sule, 2016); case studies (Harfitt & Tsui, 2015; Krassel & Heinesen, 2014; Wright et al., 2019); and research using meta-analyses (McDonald, 2013).

In Different Geographic Locations

The different geographical locations included the United States (Diette & Raghav, 2015; Matta et al., 2015; McDonald, 2013; Uhrain, 2016; Wright et al., 2019); Denmark (Krassel & Heinesen, 2014; Nandrup, 2016); Poland (Koniewski, 2013); Hong Kong (Harfitt & Tsui, 2015); the United Kingdom (Gaggero & Haile, 2020); Saudi Arabia (Almulla, 2015); West Africa (Sule, 2016); and an anonymous location (Owuor, 2018).

In a Wide Variety of Disciplines

A wide variety of disciplines were used that included introductory economics courses (Matta et al., 2015); mathematics courses (Diette & Raghav, 2015; Nandrup, 2016; Sule, 2016); English language courses (Harfitt & Tsui, 2015; Uhrain, 2016); and world and European languages courses (Wright et al., 2019). Academic disciplines were not indicated in most of the other studies conducted according to the literature review.

Regardless of the wide variety of research methodologies employed, the wide variety of geographic locations involved, and the wide variety of academic disciplines included, most of the studies conducted indicated that class size impacted students' academic achievements, consistent with the findings of this research.

Impacts of Class Size on Instructional Expenditure Per Student

As was evident in the review of the literature, one of the primary drivers of class size research was the effort of higher education institutions to control the cost of instruction. Accordingly, class size reduction (CSR) programs in California in 1996 (Rivkin et al., 2005), in South Carolina in 1998, and in Florida in 2002 (Uhrain, 2016) were all designed to determine the potential impacts of class size on the cost of instruction. Higher education institutions were interested in determining the optimum class size that would help them promote student retention, provide quality education, and control the cost of instruction. The second research question was designed to address issues raised by such CSR programs.

As was indicated earlier, the second research question dealt with the impacts of class size on institutional expenditures per class. Nine out of the 209 online institutions that constituted the total population for this research needed to have the requisite data concerning instructional expenditures per student. Therefore, the nine online institutions with "no data" for instructional

expenditures per student were excluded from the total population of 209 online institutions (see Appendix F). Therefore, the remaining 200 online institutions constituted the population used for the research. The list of the 200 online institutions was divided into a small class group of 99 items, those with student-to-teacher ratios of 12 items or less (see Appendix G) and a large class group of 101 items, those with student-to-teacher ratios of 13 or more items (see Appendix H).

A sample of 30 items was selected from the small class group of 99 items, and another sample of 30 items was selected from the large class group of 101 items for analysis. The sample items were compared and analyzed using SPSS Statistics software as was described in the methodology section in Chapter 4. The Mann–Whitney U Test indicated that the difference of the medians of the instructional expenditures per student between the small and large classes was statistically significant, $U = 117$, $z = -5.820$, $p < .001$ (see Table 3), using an asymptotic sampling distribution for U (Dinneen & Blakesley, 1973) with a large eta squared effect size of 0.49. Accordingly, the null hypothesis, $H_0 2$, was rejected, and the alternative hypothesis, $H_a 2$, was accepted (see Table 4). In other words, there was a statistically significant difference between students' instructional expenditures per student (cost of instruction) in small and large class groups. Such results attest that quality education in smaller classes comes with a cost.

Optimum Class Size

Even though most of the studies in the literature review indicated that small class sizes had direct positive impacts on students' academic outcomes, there was no consensus on the definition of the optimal small class size or the optimum cost of instruction. In the literature review, the definition of the optimal small class size depended upon several factors, such as grade levels, type of academic disciplines, and the schools' administrative constraints. For instance, small classes were defined differently in elementary schools, high schools, and

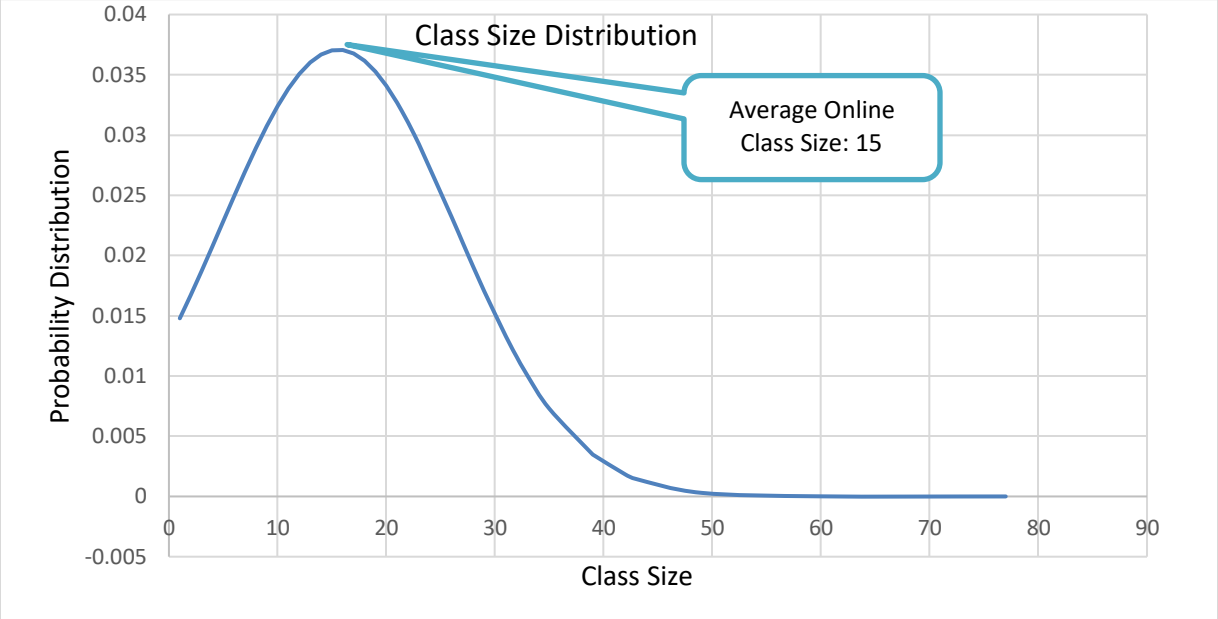
undergraduate and graduate schools. Small class size was also defined differently in courses where high-level instructor involvement was needed, such as medical science courses, as opposed to lecture-based social and natural science courses.

In the STAR program described in the literature review, small classes ranged from 15 to 17 students per class (Chingos, 2013). In the 1996 California CSR program, classes with 20 students were considered to be small (Rivkin et al., 2005). CSR programs in Ontario, Canada, considered classes with less than 20 students small (Bascia & Faubert, 2012). In an investigation of teachers' perceptions conducted by Almulla (2015), the teacher participants indicated they preferred to teach smaller classes of 15 to 20 students. In an article written by Taft et al. (2011) on the issue of optimal class size, the authors proposed the use of three educational frameworks, namely, objectivist–constructivist teaching strategies, the community of inquiry model, and Bloom's taxonomy to guide class enrollment size decisions that maintained educational quality. Because of the lack of consensus on the definition of the optimum class size, Taft et al. (2011) recommended the following as a guide in classifying class size into different categories: (a) large: ≥ 30 students, (b) medium: 16–30 students, and (c) small: ≤ 15 students.

This research defined small classes as classes containing less than 12 students each and large classes as those containing 13 or more students each. Thirteen was chosen as a dividing point between small and large classes because it was the median of the total population of 120 online institutions. Using the median as a dividing point ensured a more or less equal population from the small and large classes from which the random samples were selected. The average class size for the 120 population of the online higher education institutions on The Education Trust (n.d.) website was 15 after excluding nine institutions that did not contain the requisite class size data (see Appendix M and see Figure 4).

Figure 4

Frequency Distribution: Class Size



Even though there was no clear consensus on the definition of a small class in the literature review, the majority of the studies considered class sizes between 15 and 20 to be small. These studies further indicated that student outcomes were better in smaller classes than in larger classes.

Optimum Cost of Instruction

Regarding the cost of instruction, there were only a few studies in the literature review other than the state-funded CSR programs conducted in California in 1996, South Carolina in 1998, and Florida in 2002. The cost of instruction was not a concern of the CSR programs as much as it was improving students' academic achievements. This was because the respective states funded the CSR programs. The CSR program in California increased the number of teachers by 50%, indicating that the CSR programs were costly.

This research also showed that the average instructional expenditures per student for small classes were significantly higher than for large classes. The average instructional expenditure per student per academic year for the small class sample of 35 items, discussed in the results section, was $13,941 (see Appendix N). Assuming a full-time enrollment of 30 credit hours per academic year, the average instructional expenditure per student per credit hour for the small classes was $465 (see Appendix N). Likewise, the average instructional expenditure per student per academic year for the large class sample of 35 items (also discussed in the results section) was $3,791 (see Appendix O). Assuming a full-time enrollment of 30 credit hours per academic year, the average instructional expenditure per student per credit hour for the large classes was $126 (see Appendix O). A Mann–Whitney U test compared the mean ranks of the instructional expenditures per student of a random sample of 35 small class items with the mean ranks of the instructional expenditures per student of a random sample of 35 large class items. As discussed in the results section, the results showed a statistically significant difference in the cost of instruction between the small and large classes with a robust eta squared effect size of 0.49.

The average instructional expenditures per student per credit hour provided will have important implications for online institutions when deciding how much tuition to charge per credit hour. Although the information provided here cannot be used as best practices, online higher education institutions can use it as a benchmark in determining their optimal tuition charges.

Limitations and Delimitations

Limitations and delimitations of research results arise due to the research's scope, methods, and nature, and this research is no exception. It is a known fact that limitations arise due to factors outside the researcher's control, while delimitations arise due to those factors

within the researcher's direct control. The following paragraphs will describe the limitations and delimitations noted in this research and the steps recommended to address them.

Limitations

Even though the results of this research were statistically significant regarding the impacts of class size on students' academic achievements and institutional expenditures per student, there were some limitations.

The first limitation was the potential impact of sample bias on the research results. Based only on a sample of 35 online academic institutions, the research results are limited in their generalizability to real-life academic scenarios—both traditional brick-and-mortar and online learning environments. Further research using larger samples is important in validating the results of this research.

The second limitation was that the significant impacts of class size on students' academic achievements noted in the research results could be due to the roles of extraneous factors, such as social, psychological, and physical factors, rather than due to the sheer impacts of class size alone. For instance, Pritchard and Woollard's (2010) classroom dynamics theory attributed students' academic performances in small class environments to social factors such as the relationships between students and teachers, students to students, and teachers and parents. In addition, Blum's (2005) connectedness theory, discussed earlier, attributed students' academic achievements in smaller classes to the psychological factors of connectedness, which he defined as how well students believe they are cared for academically and as individuals. Therefore, further research in this area is essential to determine the impacts of extraneous factors other than class size.

Delimitations

When considering delimitations, the first delimitation was caused due to the lack of class size research in the online learning environments. As indicated in the problem statement, the literature review focused more on traditional or brick-and-mortar learning environments but little on online learning environments. Only a few studies were conducted on the impacts of class size on students' academic achievements in online learning environments (Bettinger et al., 2017; Sorenson, 2014). Even though this research was designed to address this issue, more research is still needed to assess the impacts of class size on students' academic achievements, particularly in online learning environments.

The second delimitation was the need for more access to classroom-level archival data. The original plan of this research was to utilize classroom-level students' academic archival data. However, the effort to obtain such archival data did not materialize because the school administrator in charge of the archival data was unwilling to provide the archival data because of the acute privacy concern prevalent in classes with a few students. I was then obliged to seek an alternative source of archival data to accomplish the research objectives. The alternative source of archival data was based on an institutional level instead of the specific classroom level. The shift from classroom to institutional-level archival data may cause other researchers to question the applicability of the results of this research to classroom-level academic environments. Hence, further research utilizing classroom-level archival data is needed to complement or confirm the results of this research.

Other Limitations

As was evident in the review of the literature, one of the primary drivers of class size research was the effort of higher education institutions to control the cost of instruction.

Accordingly, CSR programs in California in 1996 (Rivkin et al., 2005), in South Carolina in 1998, and in Florida in 2002 (Uhrain, 2016) were all designed to determine the potential impacts of class size on the cost of instructions. Higher education institutions were interested in determining the optimum class size that would help them promote student retention, provide quality education, and control instruction costs. The second research question was designed to address issues raised by such CSR programs.

One of the factors that led to CSR programs in California in 1996, South Carolina in 1998, and Florida in 2002 was determining the potential impacts of class size on the cost of instruction. Accordingly, there were only a handful of research studies in this regard, such as those by Rivkin et al. (2005) and Uhrain (2016). The research on the impacts of class size on the instructional expenditures per student was included to lay the groundwork for further future research in this area. Future research in this area is essential to meet the needs of school administrators in determining the optimum class size to provide affordable quality education to their students.

Implications

The results of this research on the impacts of class size on students' academic achievements will have numerous implications for the various stakeholders that benefit from the research results. Higher education institution administrators will benefit from the results of this research in managing their operating budgets, determining their staffing levels, and determining the appropriate class size, particularly those in online learning environments. Instructors will be interested in the results of this research in determining the appropriate pedagogical approach for delivering their courses. Students' parents will benefit from the results of this research in ensuring their children receive quality education at affordable prices. Students will benefit from

the results of this research, which will ensure they are well equipped to meet the demands of their future educational and professional endeavors. Finally, accrediting agencies will benefit from the research results by ensuring that online academic institutions comply with the requisite accrediting criteria.

Recommendations

As was discussed, the majority of the research results in the literature review indicated class size impacts students' academic achievements in significant ways. Because of the scope, nature, and environments within which the various research was conducted, further research is needed to confirm the research results also hold in various types of research scenarios. Based on the literature review, the results of this research, and the limitations and delimitations of the research results described earlier, the following recommendations for practice and theory were made.

Recommendations for Practice

First Recommendation. Salkind (2017) stated that a high degree of generalizability is an essential quality of good research. Generalizability improves as sample size increases. A random sample of 35 items was used in this research, which is considered adequate relative to the total population of this research, which was 209 online institutions. This research used a sample of 35 items due to time and resource constraints. The applicability of the research results may be challenged if it was based only on a sample of 35 items. Hence, the generalizability or reliability of the research results would be strengthened if further future research is conducted using more than a sample of 35 items.

Second Recommendation. It was noted that factors other than class size, such as social, psychological, and physical factors, could impact students' academic achievements. The roles of

such extraneous factors were discussed in Pritchard and Woollard's (2010) classroom dynamics theory and Blum's (2005) connectedness theory. Further research is recommended to determine the impacts of extraneous factors on students' academic achievements.

Third Recommendation. Even though unfettered access to data sources is a critical part of any research work, it was not quite the case when conducting this research. The original plan of this research was to utilize classroom-level students' academic archival data. However, the effort to obtain such archival data did not materialize because a school administrator in charge of the archival data was not willing to provide the data because of acute concern for privacy in classes with a small number of students. I was then obliged to seek an alternative data source to accomplish the research objectives based on the institutional level instead of specific classroom-level archival data. The shift from classroom to institutional-level archival data may cause other researchers to question the applicability of the results of this research to classroom-level academic environments. Hence, further research utilizing classroom-level archival data is recommended as further confirmation of the results of this research.

Recommendations for Research

Fourth Recommendation. One of the factors that led to CSR programs in California in 1996, South Carolina in 1998, and Florida in 2002 was determining the potential impacts of class size on the cost of instruction, or more specifically, on the instructional expenditure per student. However, there were only a few research studies in this area, such as those by Rivkin et al. (2005) and Uhrain (2016). As pointed out earlier, the research on the impact of class size on the instructional expenditures per student was included to lay the groundwork for further future research in this area. Future research in this area is important to meet the needs of school

administrators in determining the optimum class size and in providing affordable quality education to their students.

Fifth and Final Recommendation. As indicated in the problem statement, the literature review focused more on traditional or brick-and-mortar learning environments but little on online learning environments. Only a few studies were conducted, including this research, on the impacts of class size on students' academic achievements in online learning environments (Bettinger et al., 2017; Sorenson, 2014). Even though this research was designed to address this issue, more research is still recommended to assess the impacts of class size on students' academic achievements, particularly in online learning environments.

Conclusions

This research confirmed that most of the research results noted in the literature review show that class size significantly impacts students' academic achievements. This research is one of a handful of research conducted on the impacts of class size on students' academic achievements in online learning environments. This research was designed to determine the impacts of class size on students' academic achievements and the potential impacts of class size on the cost of education, specifically on the instructional expenditures per student. The research on the impacts of class size on the cost of education was conducted to lay down the groundwork for further research in this area.

The results of this research have several implications for stakeholders interested in the impacts of class size on students' academic achievements and the cost of education. As pointed out previously, higher education administrators, teachers, parents, students, and accrediting agencies all have stakes in the results of this research.

School administrators can use the results of this research in their quest for the optimum class size at an affordable cost without compromising the academic integrity of their institutions. Online higher education institutions will benefit from the results of this research because it primarily focuses on online academic intuitions, as described in the methodology section. Teachers will benefit from the results as they determine the most effective pedagogical approach for their class sizes. For instance, lecturers may prefer the lecture method for larger classes but individualized approaches for smaller classes. Parents are interested in the results as they choose the best school where their children can get quality education at affordable costs. Students are also interested in the results because they want to ensure they are well equipped to meet the demands of further educational and professional endeavors. Accrediting agencies are interested in the results in ensuring the educational institutions under their purview comply with their criteria for continued accreditations. Finally, the results of this research will serve as groundwork for further explorations of this research area on the impacts of class size on students' academic achievements and the cost of education.

As was discussed earlier, the research results have limitations and delimitations, which include (a) the possibility of sample bias that could limit the applicability of the results to the total population of online institutions, (b) the potential influence of extraneous factors, such as social, psychological, and physical factors, (c) the lack of class size research in the online learning environments, (d) the lack of access to classroom-level archival data, and, finally (e) the lack of research on the potential impacts of class size on the cost of education. However, the benefits of the results of this research outweigh the stated limitations and delimitations as future explorations of this area continue, particularly in the new and emerging online learning environments.

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Appendix A: Total Population's Graduation Rates

Class Size and Graduation Rates Within 4 Years

Item No.	College	Students-to-Teacher Ratio	Graduation Rate B.A. Within 4 Years
1	Sofia University	9	No data
2	Oglethorpe University	18	40%
3	St. John College	7	64%
4	Assumption University	13	70%
5	Becker College	12	44%
6	Princeton University	4	90%
7	CUNY Graduate School & University Center	10	No data
8	Excelsior College	19	No data
9	John Carroll University	13	67%
10	University of Portland	11	76%
11	University of Western States	8	No data
12	Strayer University–Virginia	28	7%
13	West Virginia Wesleyan College	12	47%
14	American University of Puerto Rico	17	0%
15	Antioch University–Santa Barbara	7	No data
16	Brandman University	22	0%
17	Capella University	32	0%
18	Grantham University	18	13%
19	Northcentral University	3	No data
20	Nightingale College	13	No data
21	American Business and Technology University	14	No data
22	Strayer University–Arkansas	28	100%
23	Relay Graduate School of Theology	35	No data
24	Colorado State University–Global Campus	27	No data
25	Bryan & Stratton College–Online	28	0%
26	University of Florida Online	49	63%
27	Antioch University Online	7	No data
28	United States Sports Academy	7	No data
29	California State Polytechnic University–Pomona	29	30%
30	Columbia College Hollywood	12	27%
31	Life Pacific University	12	23%
32	Marymount California University	18	17%
33	Middlebury Institute of International Studies–Monterey	1	No data
34	Pepperdine University	13	80%
35	Paine College	5	7%

Item No.	College	Students-to-Teacher Ratio	Graduation Rate B.A. Within 4 Years
36	Carleigh Dickinson University–Metropolitan Campus	15	38%
37	CUNY Brooklyn College	17	28%
38	St. Francis College	15	32%
39	Oklahoma State University–Oklahoma City	20	No data
40	Huston-Tillotson University	16	21%
41	Virginia University of Lynchburg	14	16%
42	St. John's College	7	52%
43	Ecumenical Theological Seminary	5	No data
44	W L Bonner College	3	No data
45	University of the West	5	10%
46	Strayer University–West Virginia	28	No data
47	Strayer University–Global Region	28	0%
48	Universidad Ana G Mendez–Online Campus	23	No data
49	Purdue University Global	28	14%
50	University of Wisconsin–Milwaukee Flex	18	No data
51	College Unbound	8	No data
52	Charter Oak State College	13	No data
53	Strayer University–District of Columbia	28	0%
54	Life University	14	14%
55	Ashford University	15	1%
56	University of Baltimore	13	20%
57	Emmanuel College	13	56%
58	CUNY Bernand M Baruch College	20	45%
59	Fashion Institute of Technology	17	No data
60	Bennett College	7	17%
61	Turtle Mountain Community College	9	17%
62	East Central University	18	25%
63	Wilson College	12	35%
64	National American University–Rapid City	7	0%
65	Antioch University–Seattle	3	No data
66	Vista College–Online	32	95%
67	Franklin W Olin College of Engineering	6	80%
68	University of Phoenix–Illinois	No data	0%
69	Strayer University–Pennsylvania	28	0%
70	Harrisburg University of Science and Technology	19	17%
71	Strayer University–Florida	28	67%
72	Ottawa University–Online	2	No data
73	City Vision University	7	0%
74	Strayer University–Georgia	28	0%

Item No.	College	Students-to-Teacher Ratio	Graduation Rate B.A. Within 4 Years
75	Remington College–Heathrow Campus	9	31%
76	New York Film Academy	9	33%
77	SANS Technology Institute	5	No data
78	National American University–Kings Bay	1	No data
79	University of La Verne	15	53%
80	Laguna College of Art and Design	12	44%
81	Loyola Marymount University	10	75%
82	Occidental College	8	78%
83	Luther Rice College & Seminary	11	0%
84	Clark Atlanta University	19	28%
85	Thomas University	12	23%
86	Lake Forest College	12	69%
87	Loyola University Maryland	12	77%
88	Washington College	9	69%
89	Boston Architectural College	5	4%
90	Dean College	16	49%
91	Kalamazoo College	13	72%
92	Fairleigh Dickenson University–Florham Campus	13	53%
93	Plaza College	28	No data
94	Heritage Bible College	5	0%
95	Cleveland Institute of Music	6	65%
96	American College of Financial Services	60	No data
97	Curtis Institute of Music	2	56%
98	Sioux Falls Seminary	1	No data
99	Pentecostal Theological Seminary	12	No data
100	Amberton University	20	No data
101	Baptist Missionary Association Theological Seminary	2	No data
102	Jarvis Christian College	12	9%
103	Virginia Union University	21	21%
104	American University of Puerto Rico	15	3%
105	Conservatory Music of Puerto Rico	7	25%
106	University of Puerto Rico–Bayamon	21	8%
107	ASA College	11	No data
108	Midwest College of Oriental Medicine–Evanston	9	No data
109	Averett University–Non-Traditional Programs	9	No data
110	Providence Christian College	17	29%
111	Polytechnic University of Puerto Rico–Miami	7	100%
112	Azusa Pacific University	10	51%
113	Cogswell University of Silicon Valley	14	22%

Item No.	College	Students-to-Teacher Ratio	Graduation Rate B.A. Within 4 Years
114	Walden University	19	No data
115	Montessori Education Center of the Rockies	15	No data
116	Trinity International University–Florida	4	No data
117	Morehouse College	15	40%
118	Mount Holyoke College	9	80%
119	Peirce College	13	0%
120	Voorhees College	11	32%
121	Universidad Central de Bayamon	18	4%
122	University of Phoenix–New Mexico	5	0%
123	California State University–Monterey Bay	23	29%
124	Strayer University–Maryland	28	0%
125	University of Management and Technology	9	33%
126	Family of Faith Christian University	4	0%
127	Strayer University–Delaware	28	100%
128	Strayer University–Alabama	28	0%
129	Strayer University–New Jersey	28	100%
130	Johnson and Wales University–Online	11	No data
131	National Paralegal College	39	10%
132	Bergin University of Canine Studies	9	No data
133	Independence University	33	12%
134	Arizona State University Digital Immersion	26	8%
135	University of Phoenix–Arizona	77	0%
136	International Sports Sciences Association	28	No data
137	University of the People	17	16%
138	University of Wisconsin–Parkside Flex	19	No data
139	University Arkansas System eVersity	29	No data
140	Amridge University	13	25%
141	Art Center College of Design	8	33%
142	Claremont McKenna College	8	81%
143	University of Redlands	12	63%
144	Unity College	15	43%
145	Drew University	12	64%
146	Bernard College	9	85%
147	Franklin University	13	39%
148	National University of National Medicine	5	No data
149	Rhodes College	9	79%
150	Tarleton State University	21	30%
151	Brigham Young University–Hawaii	16	27%
152	American InterContinental University	43	11%

Item No.	College	Students-to-Teacher Ratio	Graduation Rate B.A. Within 4 Years
153	Columbia Southern University	39	15%
154	Strayer University–Mississippi	28	No data
155	Strayer University–Texas	28	0%
156	Warner Pacific University Professional and Graduate Studies	20	12%
157	Shiloh University	2	No data
158	Iglobal University	8	7%
159	California InterContinental University	10	No data
160	Presbyterian Theological Seminary in America	6	25%
161	America Evangelical University	6	No data
162	Holy Names University	7	27%
163	Menlo College	17	46%
164	Colorado Technical University–Colorado Springs	31	17%
165	Nazarene Bible College	6	0%
166	Agnes Scott College	11	68%
167	Spelman College	11	65%
168	Maryland Institute College of Art	8	64%
169	Berklee College of Music	9	57%
170	Harvard University	5	86%
171	Lafayette College	9	86%
172	Morris College	12	8%
173	American National University	39	No data
174	Randolph College	8	52%
175	Antioch University–Los Angeles	5	No data
176	Midwest College of Oriental Medicine–Racine	8	No data
177	Trine University–Regional/Non-Traditional Campuses	7	0%
178	Western Governors University	42	32%
179	American College of Healthcare Sciences	19	No data
180	American Public University System	23	27%
181	American College of Education	10	No data
182	Strayer University–South Carolina	28	50%
183	Touro University Nevada	12	No data
184	American Sentinel University	11	0%
185	North American University	14	49%
186	South University–Savannah Online	15	1%
187	Catholic Distance University	4	No data
188	Florida Institute of Technology–Online	20	No data
189	Veritas Baptist College	9	33%
190	Pathways College	2	No data
191	Bryan University	39	45%

Item No.	College	Students-to-Teacher Ratio	Graduation Rate B.A. Within 4 Years
192	Humphreys University–Stockton and Modesto Campuses	12	60%
193	New School of Architecture and Design	8	6%
194	Georgetown University	11	90%
195	Lesley University	9	47%
196	Smith College	7	82%
197	Walsh College	11	No data
198	Salem College	15	64%
199	The University of the Arts	9	50%
200	Oglata Lakota College	12	0%
201	Paul Quinn College	18	11%
202	Strayer University–Tennessee	28	No data
203	Strayer University–North Carolina	28	0%
204	Taft University System	15	No data
205	Los Angeles Pacific University	23	25%
206	Midwives College of Utah	5	No data
207	Grace Mission University	18	0%
208	Abraham Lincoln University	3	No data
209	Huntington University of Health Sciences	9	No data

Appendix B: Actual Population's Graduation Rates

Class Size and Graduation Rates Within 4 Years

Population Item No.	College	Student-to-Teacher Ratio	Graduation Rate B.A. Within 4 Years
1	Ashford University	15	1%
2	South University–Savannah Online	15	1%
3	American University of Puerto Rico	15	3%
4	Boston Architectural College	5	4%
5	Universidad Central de Bayamon	18	4%
6	New School of Architecture and Design	8	6%
7	Strayer University–Virginia	28	7%
8	Paine College	5	7%
9	Iglobal University	8	7%
10	University of Puerto Rico–Bayamon	21	8%
11	Arizona State University Digital Immersion	26	8%
12	Morris College	12	8%
13	Jarvis Christian College	12	9%
14	University of the West	5	10%
15	National Paralegal College	39	10%
16	American InterContinental University	43	11%
17	Paul Quinn College	18	11%
18	Independence University	33	12%
19	Warner Pacific University Professional and Graduate Studies	20	12%
20	Grantham University	18	13%
21	Purdue University Global	28	14%
22	Life University	14	14%
23	Columbia Southern University	39	15%
24	Virginia University of Lynchburg	14	16%
25	University of the People	17	16%
26	Marymount California University	18	17%
27	Bennett College	7	17%
28	Turtle Mountain Community College	9	17%
29	Harrisburg University of Science and Technology	19	17%
30	Colorado Technical University–Colorado Springs	31	17%
31	University of Baltimore	13	20%
32	Huston-Tillotson University	16	21%
33	Virginia Union University	21	21%
34	Cogswell University of Silicon Valley	14	22%

Population Item No.	College	Student-to-Teacher Ratio	Graduation Rate B.A. Within 4 Years
35	Life Pacific University	12	23%
36	Thomas University	12	23%
37	East Central University	18	25%
38	Conservatory Music of Puerto Rico	7	25%
39	Amridge University	13	25%
40	Presbyterian Theological Seminary in America	6	25%
41	Los Angeles Pacific University	23	25%
42	Columbia College Hollywood	12	27%
43	Brigham Young University–Hawaii	16	27%
44	Holy Names University	7	27%
45	American Public University System	23	27%
46	CUNY Brooklyn College	17	28%
47	Clark Atlanta University	19	28%
48	Providence Christian College	17	29%
49	California State University–Monterey Bay	23	29%
50	California State Polytechnic University–Pomona	29	30%
51	Tarleton State University	21	30%
52	Remington College–Heathrow Campus	9	31%
53	St. Francis College	15	32%
54	Voorhees College	11	32%
55	Western Governors University	42	32%
56	New York Film Academy	9	33%
57	University of Management and Technology	9	33%
58	Art Center College of Design	8	33%
59	Veritas Baptist College	9	33%
60	Wilson College	12	35%
61	Carleigh Dickinson University–Metropolitan Campus	15	38%
62	Franklin University	13	39%
63	Oglethorpe University	18	40%
64	Morehouse College	15	40%
65	Unity College	15	43%
66	Becker College	12	44%
67	Laguna College of Art and Design	12	44%
68	CUNY Bernand M Baruch College	20	45%
69	Bryan University	39	45%
70	Menlo College	17	46%
71	West Virginia Wesleyan College	12	47%
72	Lesley University	9	47%

Population Item No.	College	Student-to-Teacher Ratio	Graduation Rate B.A. Within 4 Years
73	Dean College	16	49%
74	North American University	14	49%
75	Strayer University–South Carolina	28	50%
76	The University of the Arts	9	50%
77	Azusa Pacific University	10	51%
78	St. John's College	7	52%
79	Randolph College	8	52%
80	University of La Verne	15	53%
81	Fairleigh Dickenson University–Florham Campus	13	53%
82	Emmanuel College	13	56%
83	Curtis Institute of Music	2	56%
84	Berklee College of Music	9	57%
85	Humphreys University–Stockton and Modesto Campuses	12	60%
86	University of Florida Online	49	63%
87	University of Redlands	12	63%
88	St. John College	7	64%
89	Drew University	12	64%
90	Maryland Institute College of Art	8	64%
91	Salem College	15	64%
92	Cleveland Institute of Music	6	65%
93	Spelman College	11	65%
94	John Carroll University	13	67%
95	Strayer University–Florida	28	67%
96	Agnes Scott College	11	68%
97	Lake Forest College	12	69%
98	Washington College	9	69%
99	Assumption University	13	70%
100	Kalamazoo College	13	72%
101	Loyola Marymount University	10	75%
102	University of Portland	11	76%
103	Loyola University Maryland	12	77%
104	Occidental College	8	78%
105	Rhodes College	9	79%
106	Pepperdine University	13	80%
107	Franklin W Olin College of Engineering	6	80%
108	Mount Holyoke College	9	80%
109	Claremont McKenna College	8	81%
110	Smith College	7	82%

Population Item No.	College	Student-to-Teacher Ratio	Graduation Rate B.A. Within 4 Years
111	Bernard College	9	85%
112	Harvard University	5	86%
113	Lafayette College	9	86%
114	Princeton University	4	90%
115	Georgetown University	11	90%
116	Vista College–Online	32	95%
117	Strayer University–Arkansas	28	100%
118	Polytechnic University of Puerto Rico–Miami	7	100%
119	Strayer University–Delaware	28	100%
120	Strayer University–New Jersey	28	100%

Appendix C: Small Class Actual Population's Graduation Rates

Class Size and Graduation Rates Within 4 Years

Population Item No.	College	Student-to-Teacher Ratio	Graduation Rate B.A. Within 4 Years
1	Curtis Institute of Music	2	56%
2	Princeton University	4	90%
3	Boston Architectural College	5	4%
4	Paine College	5	7%
5	University of the West	5	10%
6	Harvard University	5	86%
7	Presbyterian Theological Seminary in America	6	25%
8	Cleveland Institute of Music	6	65%
9	Franklin W Olin College of Engineering	6	80%
10	Bennett College	7	17%
11	Conservatory Music of Puerto Rico	7	25%
12	Holy Names University	7	27%
13	St. John's College	7	52%
14	St. John College	7	64%
15	Smith College	7	82%
16	Polytechnic University of Puerto Rico–Miami	7	100%
17	New School of Architecture and Design	8	6%
18	Iglobal University	8	7%
19	Art Center College of Design	8	33%
20	Randolph College	8	52%
21	Maryland Institute College of Art	8	64%
22	Occidental College	8	78%
23	Claremont McKenna College	8	81%
24	Turtle Mountain Community College	9	17%
25	Remington College–Heathrow Campus	9	31%
26	New York Film Academy	9	33%
27	University of Management and Technology	9	33%
28	Veritas Baptist College	9	33%
29	Lesley University	9	47%
30	The University of the Arts	9	50%
31	Berklee College of Music	9	57%
32	Washington College	9	69%
33	Rhodes College	9	79%
34	Mount Holyoke College	9	80%
35	Bernard College	9	85%

Population Item No.	College	Student-to-Teacher Ratio	Graduation Rate B.A. Within 4 Years
36	Lafayette College	9	86%
37	Azusa Pacific University	10	51%
38	Loyola Marymount University	10	75%
39	Voorhees College	11	32%
40	Spelman College	11	65%
41	Agnes Scott College	11	68%
42	University of Portland	11	76%
43	Georgetown University	11	90%
44	Morris College	12	8%
45	Jarvis Christian College	12	9%
46	Life Pacific University	12	23%
47	Thomas University	12	23%
48	Columbia College Hollywood	12	27%
49	Wilson College	12	35%
50	Becker College	12	44%
51	Laguna College of Art and Design	12	44%
52	West Virginia Wesleyan College	12	47%
53	Humphreys University–Stockton and Modesto Campuses	12	60%
54	University of Redlands	12	63%
55	Drew University	12	64%
56	Lake Forest College	12	69%
57	Loyola University Maryland	12	77%

Appendix D: Large Class Actual Population's Graduation Rates

Class Size and Graduation Rates Within 4 Years

Population Item No.	College	Student-to-Teacher Ratio	Graduation Rate B.A. Within 4 Years
1	University of Baltimore	13	20%
2	Amridge University	13	25%
3	Franklin University	13	39%
4	Fairleigh Dickenson University–Florham Campus	13	53%
5	Emmanuel College	13	56%
6	John Carroll University	13	67%
7	Assumption University	13	70%
8	Kalamazoo College	13	72%
9	Pepperdine University	13	80%
10	Life University	14	14%
11	Virginia University of Lynchburg	14	16%
12	Cogswell University of Silicon Valley	14	22%
13	North American University	14	49%
14	Ashford University	15	1%
15	South University–Savannah Online	15	1%
16	American University of Puerto Rico	15	3%
17	St. Francis College	15	32%
18	Carleigh Dickinson University–Metropolitan Campus	15	38%
19	Morehouse College	15	40%
20	Unity College	15	43%
21	University of La Verne	15	53%
22	Salem College	15	64%
23	Huston-Tillotson University	16	21%
24	Brigham Young University–Hawaii	16	27%
25	Dean College	16	49%
26	University of the People	17	16%
27	CUNY Brooklyn College	17	28%
28	Providence Christian College	17	29%
29	Menlo College	17	46%
30	Universidad Central de Bayamon	18	4%
31	Paul Quinn College	18	11%
32	Grantham University	18	13%
33	Marymount California University	18	17%
34	East Central University	18	25%
35	Oglethorpe University	18	40%

Population Item No.	College	Student-to-Teacher Ratio	Graduation Rate B.A. Within 4 Years
36	Harrisburg University of Science and Technology	19	17%
37	Clark Atlanta University	19	28%
38	Warner Pacific University Professional and Graduate Studies	20	12%
39	CUNY Bernand M Baruch College	20	45%
40	University of Puerto Rico–Bayamon	21	8%
41	Virginia Union University	21	21%
42	Tarleton State University	21	30%
43	Los Angeles Pacific University	23	25%
44	American Public University System	23	27%
45	California State University–Monterey Bay	23	29%
46	Arizona State University Digital Immersion	26	8%
47	Strayer University–Virginia	28	7%
48	Purdue University Global	28	14%
49	Strayer University–South Carolina	28	50%
50	Strayer University–Florida	28	67%
51	Strayer University–Arkansas	28	100%
52	Strayer University–Delaware	28	100%
53	Strayer University–New Jersey	28	100%
54	California State Polytechnic University–Pomona	29	30%
55	Colorado Technical University–Colorado Springs	31	17%
56	Vista College–Online	32	95%
57	Independence University	33	12%
58	National Paralegal College	39	10%
59	Columbia Southern University	39	15%
60	Bryan University	39	45%
61	Western Governors University	42	32%
62	American InterContinental University	43	11%
63	University of Florida Online	49	63%

Appendix E: Total Population's Instructional Expenditures Per Student

Class Size and Instructional Expenditure Per Student

Item No.	College	Student-to-Teacher Ratio	Instructional Expenditure Per Student
1	Sofia University	9	$ 2,276
2	Oglethorpe University	18	$ 5,993
3	St. John College	7	$ 14,411
4	Assumption University	13	$ 10,218
5	Becker College	12	$ 6,911
6	Princeton University	4	$ 62,979
7	CUNY Graduate School & University Center	10	$ 44,729
8	Excelsior College	19	$ 1,435
9	John Carroll University	13	$ 10,896
10	University of Portland	11	$ 14,060
11	University of Western States	8	$ 9,076
12	Strayer University–Virginia	28	$ 1,704
13	West Virginia Wesleyan College	12	$ 6,603
14	American University of Puerto Rico	17	$ 3,500
15	Antioch University–Santa Barbara	7	$ 8,778
16	Brandman University	22	$ 4,159
17	Capella University	32	$ 2,388
18	Grantham University	18	$ 947
19	Northcentral University	3	$ 3,432
20	Nightingale College	13	$ 4,942
21	American Business and Technology University	14	$ 1,732
22	Strayer University–Arkansas	28	$ 1,093
23	Relay Graduate School of Theology	35	$ 6,657
24	Colorado State University–Global Campus	27	$ 2,258
25	Bryan & Stratton College–Online	28	$ 732
26	University of Florida Online	49	$ 4,133
27	Antioch University Online	7	No data
28	United States Sports Academy	7	$ 9,518
29	California State Polytechnic University–Pomona	29	$ 7,494
30	Columbia College Hollywood	12	$ 4,529
31	Life Pacific University	12	$ 4,735
32	Marymount California University	18	$ 6,854
33	Middlebury Institute of International Studies–Monterey	1	$ 15,217
34	Pepperdine University	13	$ 11,853

Item No.	College	Student-to-Teacher Ratio	Instructional Expenditure Per Student
35	Paine College	5	$ 7,713
36	Carleigh Dickinson University–Metropolitan Campus	15	$ 9,587
37	CUNY Brooklyn College	17	$ 10,818
38	St. Francis College	15	$ 8,958
39	Oklahoma State University–Oklahoma City	20	$ 8,050
40	Huston-Tillotson University	16	$ 5,068
41	Virginia University of Lynchburg	14	$ 12,834
42	St. John's College	7	$ 14,844
43	Ecumenical Theological Seminary	5	$ 6,026
44	W L Bonner College	3	No data
45	University of the West	5	$ 12,523
46	Strayer University–West Virginia	28	$ 1,171
47	Strayer University–Global Region	28	$ 1,761
48	Universidad Ana G Mendez–Online Campus	23	$ 4,017
49	Purdue University Global	28	$ 1,402
50	University of Wisconsin–Milwaukee Flex	18	$ 3,330
51	College Unbound	8	$ 5,041
52	Charter Oak State College	13	$ 5,375
53	Strayer University–District of Columbia	28	$ 3,519
54	Life University	14	$ 6,046
55	Ashford University	15	$ 2,583
56	University of Baltimore	13	$ 13,451
57	Emmanuel College	13	$ 9,000
58	CUNY Bernand M Baruch College	20	$ 10,719
59	Fashion Institute of Technology	17	$ 12,623
60	Bennett College	7	$ 13,522
61	Turtle Mountain Community College	9	$ 11,656
62	East Central University	18	$ 8,379
63	Wilson College	12	$ 5,269
64	National American University–Rapid City	7	$ 3,653
65	Antioch University–Seattle	3	$ 11,204
66	Vista College–Online	32	$ 1,277
67	Franklin W Olin College of Engineering	6	$ 32,824
68	University of Phoenix–Illinois	No data	$ 1,416
69	Strayer University–Pennsylvania	28	$ 1,287
70	Harrisburg University of Science and Technology	19	$ 8,270
71	Strayer University–Florida	28	$ 1,931
72	Ottawa University–Online	2	$ 12,212
73	City Vision University	7	$ 1,333

Item No.	College	Student-to-Teacher Ratio	Instructional Expenditure Per Student
74	Strayer University–Georgia	28	$ 1,284
75	Remington College–Heathrow Campus	9	No data
76	New York Film Academy	9	$ 8,691
77	SANS Technology Institute	5	$ 11,118
78	National American University–Kings Bay	1	No data
79	University of La Verne	15	$ 10,571
80	Laguna College of Art and Design	12	$ 10,929
81	Loyola Marymount University	10	$ 18,413
82	Occidental College	8	$ 21,037
83	Luther Rice College & Seminary	11	$ 3,596
84	Clark Atlanta University	19	$ 7,106
85	Thomas University	12	$ 8,621
86	Lake Forest College	12	$ 11,242
87	Loyola University Maryland	12	$ 12,596
88	Washington College	9	$ 17,278
89	Boston Architectural College	5	$ 10,537
90	Dean College	16	$ 6,708
91	Kalamazoo College	13	$ 17,403
92	Fairleigh Dickenson University–Florham Campus	13	$ 11,704
93	Plaza College	28	$ 4,748
94	Heritage Bible College	5	$ 3,183
95	Cleveland Institute of Music	6	$ 29,283
96	American College of Financial Services	60	$ 2,921
97	Curtis Institute of Music	2	$ 53,368
98	Sioux Falls Seminary	1	$ 4,051
99	Pentecostal Theological Seminary	12	$ 6,712
100	Amberton University	20	$ 2,950
101	Baptist Missionary Association Theological Seminary	2	$ 5,119
102	Jarvis Christian College	12	$ 5,029
103	Virginia Union University	21	$ 6,952
104	American University of Puerto Rico	15	$ 3,538
105	Conservatory Music of Puerto Rico	7	$ 14,843
106	University of Puerto Rico–Bayamon	21	$ 5,947
107	ASA College	11	$ 5,596
108	Midwest College of Oriental Medicine–Evanston	9	$ 4,780
109	Averett University–Non-Traditional Programs	9	$ 4,586
110	Providence Christian College	17	$ 7,721
111	Polytechnic University of Puerto Rico–Miami	7	$ 3,073
112	Azusa Pacific University	10	$ 10,631

Item No.	College	Student-to-Teacher Ratio	Instructional Expenditure Per Student
113	Cogswell University of Silicon Valley	14	$ 5,503
114	Walden University	19	$ 3,039
115	Montessori Education Center of the Rockies	15	$ 6,291
116	Trinity International University–Florida	4	$ 6,193
117	Morehouse College	15	$ 9,890
118	Mount Holyoke College	9	$ 25,056
119	Peirce College	13	$ 7,364
120	Voorhees College	11	$ 6,630
121	Universidad Central de Bayamon	18	$ 3,352
122	University of Phoenix–New Mexico	5	No data
123	California State University–Monterey Bay	23	$ 9,150
124	Strayer University–Maryland	28	$ 1,669
125	University of Management and Technology	9	$ 772
126	Family of Faith Christian University	4	$ 2,867
127	Strayer University–Delaware	28	$ 1,345
128	Strayer University–Alabama	28	$ 1,241
129	Strayer University–New Jersey	28	$ 1,548
130	Johnson and Wales University–Online	11	$ 5,156
131	National Paralegal College	39	$ 1,160
132	Bergin University of Canine Studies	9	$ 11,890
133	Independence University	33	$ 1,971
134	Arizona State University Digital Immersion	26	$ 3,762
135	University of Phoenix–Arizona	77	$ 1,594
136	International Sports Sciences Association	28	$ 1,633
137	University of the People	17	No data
138	University of Wisconsin–Parkside Flex	19	$ 3,787
139	University Arkansas System eVersity	29	$ 425
140	Amridge University	13	$ 3,664
141	Art Center College of Design	8	$ 22,504
142	Claremont McKenna College	8	$ 32,345
143	University of Redlands	12	$ 12,012
144	Unity College	15	$ 5,510
145	Drew University	12	$ 10,779
146	Bernard College	9	$ 29,073
147	Franklin University	13	$ 4,588
148	National University of National Medicine	5	$ 15,128
149	Rhodes College	9	$ 15,801
150	Tarleton State University	21	$ 6,231
151	Brigham Young University–Hawaii	16	$ 11,971

Item No.	College	Student-to-Teacher Ratio	Instructional Expenditure Per Student
152	American InterContinental University	43	$ 1,389
153	Columbia Southern University	39	$ 2,050
154	Strayer University–Mississippi	28	$ 1,467
155	Strayer University–Texas	28	$ 1,261
156	Warner Pacific University Professional and Graduate Studies	20	$ 7,197
157	Shiloh University	2	$ 5,525
158	Iglobal University	8	$ 2,971
159	California InterContinental University	10	$ 1,884
160	Presbyterian Theological Seminary in America	6	$ 825
161	America Evangelical University	6	$ 6,179
162	Holy Names University	7	$ 10,120
163	Menlo College	17	$ 7,556
164	Colorado Technical University–Colorado Springs	31	$ 1,515
165	Nazarene Bible College	6	$ 5,718
166	Agnes Scott College	11	$ 17,401
167	Spelman College	11	$ 15,268
168	Maryland Institute College of Art	8	$ 17,629
169	Berklee College of Music	9	$ 20,709
170	Harvard University	5	$ 45,396
171	Lafayette College	9	$ 25,355
172	Morris College	12	$ 8,055
173	American National University	39	$ 3,777
174	Randolph College	8	$ 17,635
175	Antioch University–Los Angeles	5	$ 11,896
176	Midwest College of Oriental Medicine–Racine	8	$ 5,214
177	Trine University–Regional/Non-Traditional Campuses	7	$ 4,401
178	Western Governors University	42	$ 3,085
179	American College of Healthcare Sciences	19	$ 1,593
180	American Public University System	23	$ 1,732
181	American College of Education	10	No data
182	Strayer University–South Carolina	28	$ 1,270
183	Touro University Nevada	12	$ 11,630
184	American Sentinel University	11	$ 2,743
185	North American University	14	$ 7,680
186	South University–Savannah Online	15	$ 2,787
187	Catholic Distance University	4	$ 2,460
188	Florida Institute of Technology–Online	20	$ 2,356
189	Veritas Baptist College	9	$ 2,120

Item No.	College	Student-to-Teacher Ratio	Instructional Expenditure Per Student
190	Pathways College	2	$ 23,973
191	Bryan University	39	$ 4,763
192	Humphreys University–Stockton and Modesto Campuses	12	$ 6,989
193	New School of Architecture and Design	8	$ 6,847
194	Georgetown University	11	$ 31,957
195	Lesley University	9	$ 12,453
196	Smith College	7	$ 29,001
197	Walsh College	11	$ 6,688
198	Salem College	15	$ 9,135
199	The University of the Arts	9	$ 13,885
200	Oglata Lakota College	12	$ 7,856
201	Paul Quinn College	18	$ 2,745
202	Strayer University–Tennessee	28	$ 1,070
203	Strayer University–North Carolina	28	$ 1,320
204	Taft University System	15	$ 639
205	Los Angeles Pacific University	23	$ 1,865
206	Midwives College of Utah	5	$ 1,912
207	Grace Mission University	18	No data
208	Abraham Lincoln University	3	$ 398
209	Huntington University of Health Sciences	9	$ 1,709

Appendix F: Actual Population's Instructional Expenditures Per Student

Class Size and Instructional Expenditure Per Student

Item No.	College	Student-to-Teacher Ratio	Instructional Expenditure Per Student
1	Abraham Lincoln University	3	$ 398
2	University Arkansas System eVersity	29	$ 425
3	Taft University System	15	$ 639
4	Bryan & Stratton College–Online	28	$ 732
5	University of Management and Technology	9	$ 772
6	Presbyterian Theological Seminary in America	6	$ 825
7	Grantham University	18	$ 947
8	Strayer University–Tennessee	28	$ 1,070
9	Strayer University–Arkansas	28	$ 1,093
10	National Paralegal College	39	$ 1,160
11	Strayer University–West Virginia	28	$ 1,171
12	Strayer University–Alabama	28	$ 1,241
13	Strayer University–Texas	28	$ 1,261
14	Strayer University–South Carolina	28	$ 1,270
15	Vista College–Online	32	$ 1,277
16	Strayer University–Georgia	28	$ 1,284
17	Strayer University–Pennsylvania	28	$ 1,287
18	Strayer University–North Carolina	28	$ 1,320
19	City Vision University	7	$ 1,333
20	Strayer University–Delaware	28	$ 1,345
21	American InterContinental University	43	$ 1,389
22	Purdue University Global	28	$ 1,402
23	Excelsior College	19	$ 1,435
24	Strayer University–Mississippi	28	$ 1,467
25	Colorado Technical University–Colorado Springs	31	$ 1,515
26	Strayer University–New Jersey	28	$ 1,548
27	American College of Healthcare Sciences	19	$ 1,593
28	University of Phoenix–Arizona	77	$ 1,594
29	International Sports Sciences Association	28	$ 1,633
30	Strayer University–Maryland	28	$ 1,669
31	Strayer University–Virginia	28	$ 1,704
32	Huntington University of Health Sciences	9	$ 1,709
33	American Business and Technology University	14	$ 1,732
34	American Public University System	23	$ 1,732
35	Strayer University–Global Region	28	$ 1,761

Item No.	College	Student-to-Teacher Ratio	Instructional Expenditure Per Student
36	Los Angeles Pacific University	23	$ 1,865
37	California InterContinental University	10	$ 1,884
38	Midwives College of Utah	5	$ 1,912
39	Strayer University–Florida	28	$ 1,931
40	Independence University	33	$ 1,971
41	Columbia Southern University	39	$ 2,050
42	Veritas Baptist College	9	$ 2,120
43	Colorado State University–Global Campus	27	$ 2,258
44	Sofia University	9	$ 2,276
45	Florida Institute of Technology–Online	20	$ 2,356
46	Capella University	32	$ 2,388
47	Catholic Distance University	4	$ 2,460
48	Ashford University	15	$ 2,583
49	American Sentinel University	11	$ 2,743
50	Paul Quinn College	18	$ 2,745
51	South University–Savannah Online	15	$ 2,787
52	Family of Faith Christian University	4	$ 2,867
53	American College of Financial Services	60	$ 2,921
54	Amberton University	20	$ 2,950
55	Iglobal University	8	$ 2,971
56	Walden University	19	$ 3,039
57	Polytechnic University of Puerto Rico–Miami	7	$ 3,073
58	Western Governors University	42	$ 3,085
59	Heritage Bible College	5	$ 3,183
60	University of Wisconsin–Milwaukee Flex	18	$ 3,330
61	Universidad Central de Bayamon	18	$ 3,352
62	Northcentral University	3	$ 3,432
63	American University of Puerto Rico	17	$ 3,500
64	Strayer University–District of Columbia	28	$ 3,519
65	American University of Puerto Rico	15	$ 3,538
66	Luther Rice College & Seminary	11	$ 3,596
67	National American University–Rapid City	7	$ 3,653
68	Amridge University	13	$ 3,664
69	Arizona State University Digital Immersion	26	$ 3,762
70	American National University	39	$ 3,777
71	University of Wisconsin–Parkside Flex	19	$ 3,787
72	Universidad Ana G Mendez–Online Campus	23	$ 4,017
73	Sioux Falls Seminary	1	$ 4,051
74	University of Florida Online	49	$ 4,133

Item No.	College	Student-to-Teacher Ratio	Instructional Expenditure Per Student
75	Brandman University	22	$ 4,159
76	Trine University–Regional/Non-Traditional Campuses	7	$ 4,401
77	Columbia College Hollywood	12	$ 4,529
78	Averett University–Non-Traditional Programs	9	$ 4,586
79	Franklin University	13	$ 4,588
80	Life Pacific University	12	$ 4,735
81	Plaza College	28	$ 4,748
82	Bryan University	39	$ 4,763
83	Midwest College of Oriental Medicine–Evanston	9	$ 4,780
84	Nightingale College	13	$ 4,942
85	Jarvis Christian College	12	$ 5,029
86	College Unbound	8	$ 5,041
87	Huston-Tillotson University	16	$ 5,068
88	Baptist Missionary Association Theological Seminary	2	$ 5,119
89	Johnson and Wales University–Online	11	$ 5,156
90	Midwest College of Oriental Medicine–Racine	8	$ 5,214
91	Wilson College	12	$ 5,269
92	Charter Oak State College	13	$ 5,375
93	Cogswell University of Silicon Valley	14	$ 5,503
94	Unity College	15	$ 5,510
95	Shiloh University	2	$ 5,525
96	ASA College	11	$ 5,596
97	Nazarene Bible College	6	$ 5,718
98	University of Puerto Rico–Bayamon	21	$ 5,947
99	Oglethorpe University	18	$ 5,993
100	Ecumenical Theological Seminary	5	$ 6,026
101	Life University	14	$ 6,046
102	America Evangelical University	6	$ 6,179
103	Trinity International University–Florida	4	$ 6,193
104	Tarleton State University	21	$ 6,231
105	Montessori Education Center of the Rockies	15	$ 6,291
106	West Virginia Wesleyan College	12	$ 6,603
107	Voorhees College	11	$ 6,630
108	Relay Graduate School of Theology	35	$ 6,657
109	Walsh College	11	$ 6,688
110	Dean College	16	$ 6,708
111	Pentecostal Theological Seminary	12	$ 6,712
112	New School of Architecture and Design	8	$ 6,847
113	Marymount California University	18	$ 6,854

Item No.	College	Student-to-Teacher Ratio	Instructional Expenditure Per Student
114	Becker College	12	$ 6,911
115	Virginia Union University	21	$ 6,952
116	Humphreys University–Stockton and Modesto Campuses	12	$ 6,989
117	Clark Atlanta University	19	$ 7,106
118	Warner Pacific University Professional and Graduate Studies	20	$ 7,197
119	Peirce College	13	$ 7,364
120	California State Polytechnic University–Pomona	29	$ 7,494
121	Menlo College	17	$ 7,556
122	North American University	14	$ 7,680
123	Paine College	5	$ 7,713
124	Providence Christian College	17	$ 7,721
125	Oglata Lakota College	12	$ 7,856
126	Oklahoma State University–Oklahoma City	20	$ 8,050
127	Morris College	12	$ 8,055
128	Harrisburg University of Science and Technology	19	$ 8,270
129	East Central University	18	$ 8,379
130	Thomas University	12	$ 8,621
131	New York Film Academy	9	$ 8,691
132	Antioch University–Santa Barbara	7	$ 8,778
133	St. Francis College	15	$ 8,958
134	Emmanuel College	13	$ 9,000
135	University of Western States	8	$ 9,076
136	Salem College	15	$ 9,135
137	California State University–Monterey Bay	23	$ 9,150
138	United States Sports Academy	7	$ 9,518
139	Carleigh Dickinson University–Metropolitan Campus	15	$ 9,587
140	Morehouse College	15	$ 9,890
141	Holy Names University	7	$ 10,120
142	Assumption University	13	$ 10,218
143	Boston Architectural College	5	$ 10,537
144	University of La Verne	15	$ 10,571
145	Azusa Pacific University	10	$ 10,631
146	CUNY Bernand M Baruch College	20	$ 10,719
147	Drew University	12	$ 10,779
148	CUNY Brooklyn College	17	$ 10,818
149	John Carroll University	13	$ 10,896
150	Laguna College of Art and Design	12	$ 10,929
151	SANS Technology Institute	5	$ 11,118
152	Antioch University–Seattle	3	$ 11,204

Item No.	College	Student-to-Teacher Ratio	Instructional Expenditure Per Student
153	Lake Forest College	12	$ 11,242
154	Touro University Nevada	12	$ 11,630
155	Turtle Mountain Community College	9	$ 11,656
156	Fairleigh Dickenson University–Florham Campus	13	$ 11,704
157	Pepperdine University	13	$ 11,853
158	Bergin University of Canine Studies	9	$ 11,890
159	Antioch University–Los Angeles	5	$ 11,896
160	Brigham Young University–Hawaii	16	$ 11,971
161	University of Redlands	12	$ 12,012
162	Ottawa University–Online	2	$ 12,212
163	Lesley University	9	$ 12,453
164	University of the West	5	$ 12,523
165	Loyola University Maryland	12	$ 12,596
166	Fashion Institute of Technology	17	$ 12,623
167	Virginia University of Lynchburg	14	$ 12,834
168	University of Baltimore	13	$ 13,451
169	Bennett College	7	$ 13,522
170	The University of the Arts	9	$ 13,885
171	University of Portland	11	$ 14,060
172	St. John College	7	$ 14,411
173	Conservatory Music of Puerto Rico	7	$ 14,843
174	St. John’s College	7	$ 14,844
175	National University of National Medicine	5	$ 15,128
176	Middlebury Institute of International Studies–Monterey	1	$ 15,217
177	Spelman College	11	$ 15,268
178	Rhodes College	9	$ 15,801
179	Washington College	9	$ 17,278
180	Agnes Scott College	11	$ 17,401
181	Kalamazoo College	13	$ 17,403
182	Maryland Institute College of Art	8	$ 17,629
183	Randolph College	8	$ 17,635
184	Loyola Marymount University	10	$ 18,413
185	Berklee College of Music	9	$ 20,709
186	Occidental College	8	$ 21,037
187	Art Center College of Design	8	$ 22,504
188	Pathways College	2	$ 23,973
189	Mount Holyoke College	9	$ 25,056
190	Lafayette College	9	$ 25,355
191	Smith College	7	$ 29,001

Item No.	College	Student-to-Teacher Ratio	Instructional Expenditure Per Student
192	Bernard College	9	$ 29,073
193	Cleveland Institute of Music	6	$ 29,283
194	Georgetown University	11	$ 31,957
195	Claremont McKenna College	8	$ 32,345
196	Franklin W Olin College of Engineering	6	$ 32,824
197	CUNY Graduate School & University Center	10	$ 44,729
198	Harvard University	5	$ 45,396
199	Curtis Institute of Music	2	$ 53,368
200	Princeton University	4	$ 62,979

Appendix G: Small Class Actual Population's Instructional Expenditures Per Student

Class Size and Instructional Expenditure Per Student

Population Item No.	College	Student-to-Teacher Ratio	Instructional Expenditure Per Student
1	Sioux Falls Seminary	1	$ 4,051
2	Middlebury Institute of International Studies–Monterey	1	$ 15,217
3	Baptist Missionary Association Theological Seminary	2	$ 5,119
4	Shiloh University	2	$ 5,525
5	Ottawa University–Online	2	$ 12,212
6	Pathways College	2	$ 23,973
7	Curtis Institute of Music	2	$ 53,368
8	Abraham Lincoln University	3	$ 398
9	Northcentral University	3	$ 3,432
10	Antioch University–Seattle	3	$ 11,204
11	Catholic Distance University	4	$ 2,460
12	Family of Faith Christian University	4	$ 2,867
13	Trinity International University–Florida	4	$ 6,193
14	Princeton University	4	$ 62,979
15	Midwives College of Utah	5	$ 1,912
16	Heritage Bible College	5	$ 3,183
17	Ecumenical Theological Seminary	5	$ 6,026
18	Paine College	5	$ 7,713
19	Boston Architectural College	5	$ 10,537
20	SANS Technology Institute	5	$ 11,118
21	Antioch University–Los Angeles	5	$ 11,896
22	University of the West	5	$ 12,523
23	National University of National Medicine	5	$ 15,128
24	Harvard University	5	$ 45,396
25	Presbyterian Theological Seminary in America	6	$ 825
26	Nazarene Bible College	6	$ 5,718
27	America Evangelical University	6	$ 6,179
28	Cleveland Institute of Music	6	$ 29,283
29	Franklin W Olin College of Engineering	6	$ 32,824
30	City Vision University	7	$ 1,333
31	Polytechnic University of Puerto Rico–Miami	7	$ 3,073
32	National American University–Rapid City	7	$ 3,653
33	Trine University–Regional/Non-Traditional Campuses	7	$ 4,401
34	Antioch University–Santa Barbara	7	$ 8,778
35	United States Sports Academy	7	$ 9,518

Population Item No.	College	Student-to-Teacher Ratio	Instructional Expenditure Per Student
36	Holy Names University	7	$ 10,120
37	Bennett College	7	$ 13,522
38	St. John College	7	$ 14,411
39	Conservatory Music of Puerto Rico	7	$ 14,843
40	St. John's College	7	$ 14,844
41	Smith College	7	$ 29,001
42	Iglobal University	8	$ 2,971
43	College Unbound	8	$ 5,041
44	Midwest College of Oriental Medicine–Racine	8	$ 5,214
45	New School of Architecture and Design	8	$ 6,847
46	University of Western States	8	$ 9,076
47	Maryland Institute College of Art	8	$ 17,629
48	Randolph College	8	$ 17,635
49	Occidental College	8	$ 21,037
50	Art Center College of Design	8	$ 22,504
51	Claremont McKenna College	8	$ 32,345
52	University of Management and Technology	9	$ 772
53	Huntington University of Health Sciences	9	$ 1,709
54	Veritas Baptist College	9	$ 2,120
55	Sofia University	9	$ 2,276
56	Averett University–Non-Traditional Programs	9	$ 4,586
57	Midwest College of Oriental Medicine–Evanston	9	$ 4,780
58	New York Film Academy	9	$ 8,691
59	Turtle Mountain Community College	9	$ 11,656
60	Bergin University of Canine Studies	9	$ 11,890
61	Lesley University	9	$ 12,453
62	The University of the Arts	9	$ 13,885
63	Rhodes College	9	$ 15,801
64	Washington College	9	$ 17,278
65	Berklee College of Music	9	$ 20,709
66	Mount Holyoke College	9	$ 25,056
67	Lafayette College	9	$ 25,355
68	Bernard College	9	$ 29,073
69	California InterContinental University	10	$ 1,884
70	Azusa Pacific University	10	$ 10,631
71	Loyola Marymount University	10	$ 18,413
72	CUNY Graduate School & University Center	10	$ 44,729
73	American Sentinel University	11	$ 2,743
74	Luther Rice College & Seminary	11	$ 3,596

Population Item No.	College	Student-to-Teacher Ratio	Instructional Expenditure Per Student
75	Johnson and Wales University–Online	11	$ 5,156
76	ASA College	11	$ 5,596
77	Voorhees College	11	$ 6,630
78	Walsh College	11	$ 6,688
79	University of Portland	11	$ 14,060
80	Spelman College	11	$ 15,268
81	Agnes Scott College	11	$ 17,401
82	Georgetown University	11	$ 31,957
83	Columbia College Hollywood	12	$ 4,529
84	Life Pacific University	12	$ 4,735
85	Jarvis Christian College	12	$ 5,029
86	Wilson College	12	$ 5,269
87	West Virginia Wesleyan College	12	$ 6,603
88	Pentecostal Theological Seminary	12	$ 6,712
89	Becker College	12	$ 6,911
90	Humphreys University–Stockton and Modesto Campuses	12	$ 6,989
91	Oglata Lakota College	12	$ 7,856
92	Morris College	12	$ 8,055
93	Thomas University	12	$ 8,621
94	Drew University	12	$ 10,779
95	Laguna College of Art and Design	12	$ 10,929
96	Lake Forest College	12	$ 11,242
97	Touro University Nevada	12	$ 11,630
98	University of Redlands	12	$ 12,012
99	Loyola University Maryland	12	$ 12,596

Appendix H: Large Class Actual Population's Instructional Expenditures Per Student

Class Size and Instructional Expenditure Per Student

Population Item No.	College	Student-to-Teacher Ratio	Instructional Expenditure Per Student
1	Amridge University	13	$ 3,664
2	Franklin University	13	$ 4,588
3	Nightingale College	13	$ 4,942
4	Charter Oak State College	13	$ 5,375
5	Peirce College	13	$ 7,364
6	Emmanuel College	13	$ 9,000
7	Assumption University	13	$ 10,218
8	John Carroll University	13	$ 10,896
9	Fairleigh Dickenson University–Florham Campus	13	$ 11,704
10	Pepperdine University	13	$ 11,853
11	University of Baltimore	13	$ 13,451
12	Kalamazoo College	13	$ 17,403
13	American Business and Technology University	14	$ 1,732
14	Cogswell University of Silicon Valley	14	$ 5,503
15	Life University	14	$ 6,046
16	North American University	14	$ 7,680
17	Virginia University of Lynchburg	14	$ 12,834
18	Taft University System	15	$ 639
19	Ashford University	15	$ 2,583
20	South University–Savannah Online	15	$ 2,787
21	American University of Puerto Rico	15	$ 3,538
22	Unity College	15	$ 5,510
23	Montessori Education Center of the Rockies	15	$ 6,291
24	St Francis College	15	$ 8,958
25	Salem College	15	$ 9,135
26	Carleigh Dickinson University–Metropolitan Campus	15	$ 9,587
27	Morehouse College	15	$ 9,890
28	University of La Verne	15	$ 10,571
29	Huston-Tillotson University	16	$ 5,068
30	Dean College	16	$ 6,708
31	Brigham Young University–Hawaii	16	$ 11,971
32	American University of Puerto Rico	17	$ 3,500
33	Menlo College	17	$ 7,556
34	Providence Christian College	17	$ 7,721

Population Item No.	College	Student-to-Teacher Ratio	Instructional Expenditure Per Student
35	CUNY Brooklyn College	17	$ 10,818
36	Fashion Institute of Technology	17	$ 12,623
37	Grantham University	18	$ 947
38	Paul Quinn College	18	$ 2,745
39	University of Wisconsin–Milwaukee Flex	18	$ 3,330
40	Universidad Central de Bayamon	18	$ 3,352
41	Oglethorpe University	18	$ 5,993
42	Marymount California University	18	$ 6,854
43	East Central University	18	$ 8,379
44	Excelsior College	19	$ 1,435
45	American College of Healthcare Sciences	19	$ 1,593
46	Walden University	19	$ 3,039
47	University of Wisconsin–Parkside Flex	19	$ 3,787
48	Clark Atlanta University	19	$ 7,106
49	Harrisburg University of Science and Technology	19	$ 8,270
50	Florida Institute of Technology–Online	20	$ 2,356
51	Amberton University	20	$ 2,950
52	Warner Pacific University Professional and Graduate Studies	20	$ 7,197
53	Oklahoma State University–Oklahoma City	20	$ 8,050
54	CUNY Bernand M Baruch College	20	$ 10,719
55	University of Puerto Rico–Bayamon	21	$ 5,947
56	Tarleton State University	21	$ 6,231
57	Virginia Union University	21	$ 6,952
58	Brandman University	22	$ 4,159
59	American Public University System	23	$ 1,732
60	Los Angeles Pacific University	23	$ 1,865
61	Universidad Ana G Mendez–Online Campus	23	$ 4,017
62	California State University–Monterey Bay	23	$ 9,150
63	Arizona State University Digital Immersion	26	$ 3,762
64	Colorado State University–Global Campus	27	$ 2,258
65	Bryan & Stratton College–Online	28	$ 732
66	Strayer University–Tennessee	28	$ 1,070
67	Strayer University–Arkansas	28	$ 1,093
68	Strayer University–West Virginia	28	$ 1,171
69	Strayer University–Alabama	28	$ 1,241
70	Strayer University–Texas	28	$ 1,261
71	Strayer University–South Carolina	28	$ 1,270
72	Strayer University–Georgia	28	$ 1,284
73	Strayer University–Pennsylvania	28	$ 1,287

Population Item No.	College	Student-to-Teacher Ratio	Instructional Expenditure Per Student
74	Strayer University–North Carolina	28	$ 1,320
75	Strayer University–Delaware	28	$ 1,345
76	Purdue University Global	28	$ 1,402
77	Strayer University–Mississippi	28	$ 1,467
78	Strayer University–New Jersey	28	$ 1,548
79	International Sports Sciences Association	28	$ 1,633
80	Strayer University–Maryland	28	$ 1,669
81	Strayer University–Virginia	28	$ 1,704
82	Strayer University–Global Region	28	$ 1,761
83	Strayer University–Florida	28	$ 1,931
84	Strayer University–District of Columbia	28	$ 3,519
85	Plaza College	28	$ 4,748
86	University Arkansas System eVersity	29	$ 425
87	California State Polytechnic University–Pomona	29	$ 7,494
88	Colorado Technical University–Colorado Springs	31	$ 1,515
89	Vista College–Online	32	$ 1,277
90	Capella University	32	$ 2,388
91	Independence University	33	$ 1,971
92	Relay Graduate School of Theology	35	$ 6,657
93	National Paralegal College	39	$ 1,160
94	Columbia Southern University	39	$ 2,050
95	American National University	39	$ 3,777
96	Bryan University	39	$ 4,763
97	Western Governors University	42	$ 3,085
98	American InterContinental University	43	$ 1,389
99	University of Florida Online	49	$ 4,133
100	American College of Financial Services	60	$ 2,921
101	University of Phoenix–Arizona	77	$ 1,594

Appendix I: Small Class Sample's Graduation Rates

Class Size and Graduation Rates Within 4 Years

Sample Item No.	Population Item No. Selected	Duplicate Item Replaced With Next Item on the List	College	Student-to-Teacher Ratio	Graduation Rate B.A. Within 4 Years
1	55		Drew University	12	64%
2	47		Thomas University	12	23%
3	11		Conservatory Music of Puerto Rico	7	25%
4	17		New School of Architecture and Design	8	6%
5	20		Randolph College	8	52%
6	9		Franklin W Olin College of Engineering	6	80%
7	20	21	Maryland Institute College of Art	8	64%
8	28		Veritas Baptist College	9	33%
9	36		Lafayette College	9	86%
10	53		Humphreys University–Stockton and Modesto Campuses	12	60%
11	54		University of Redlands	12	63%
12	26		New York Film Academy	9	33%
13	29		Lesley University	9	47%
14	3		Boston Architectural College	5	4%
15	47	50	Becker College	12	44%
16	45		Jarvis Christian College	12	9%
17	42		University of Portland	11	76%
18	52		West Virginia Wesleyan College	12	47%
19	54	3	Boston Architectural College	5	4%
20	42	43	Georgetown University	11	90%
21	49		Wilson College	12	35%
22	11	12	Holy Names University	7	27%
23	11	13	St. John’s College	7	52%
24	52	2	Princeton University	4	90%
25	46		Life Pacific University	12	23%
26	56		Lake Forest College	12	69%
27	7		Presbyterian Theological Seminary in America	6	25%
28	28	31	Berklee College of Music	9	57%
29	55	4	Paine College	5	7%
30	24		Turtle Mountain Community College	9	17%
31	55	5	Paine College	5	7%
32	47	51	Laguna College of Art and Design	12	44%
33	30		The University of the Arts	9	50%
34	29	32	Washington College	9	69%

Sample Item No.	Population Item No. Selected	Duplicate Item Replaced With Next Item on the List	College	Student-to-Teacher Ratio	Graduation Rate B.A. Within 4 Years
35	1		Curtis Institute of Music	2	56%

Appendix J: Large Class Sample's Graduation Rates

Class Size and Graduation Rates Within 4 Years

Sample Item No.	Population Item No. Selected	Duplicate Item Replaced With Next Item on the List	College	Student-to-Teacher Ratio	Graduation Rate B.A. Within 4 Years
1	42		Tarleton State University	21	30%
2	33		Marymount California University	18	17%
3	51		Strayer University–Arkansas	28	100%
4	52		Strayer University–Delaware	28	100%
5	27		CUNY Brooklyn College	17	28%
6	61		Western Governors University	42	32%
7	7		Assumption University	13	70%
8	17		St. Francis College	15	32%
9	57		Independence University	33	12%
10	52	53	Strayer University–New Jersey	28	100%
11	7	8	Kalamazoo College	13	72%
12	9		Pepperdine University	13	80%
13	38		Warner Pacific University Professional and Graduate Studies	20	12%
14	23		Huston-Tillotson University	16	21%
15	16		American University of Puerto Rico	15	3%
16	11		Virginia University of Lynchburg	14	16%
17	49		Strayer University–South Carolina	28	50%
18	5		Emmanuel College	13	56%
19	60		Bryan University	39	45%
20	11	12	Cogswell University of Silicon Valley	14	22%
21	44		American Public University System	23	27%
22	45		California State University–Monterey Bay	23	29%
23	9	10	Life University	14	14%
24	14		Ashford University	15	1%
25	55		Colorado Technical University–Colorado Springs	31	17%
26	62		American InterContinental University	43	11%

Sample Item No.	Population Item No. Selected	Duplicate Item Replaced With Next Item on the List	College	Student-to-Teacher Ratio	Graduation Rate B.A. Within 4 Years
27	51	54	California State Polytechnic University–Pomona	29	30%
28	40		University of Puerto Rico–Bayamon	21	8%
29	30		Universidad Central de Bayamon	18	4%
30	36		Harrisburg University of Science and Technology	19	17%
31	14	15	South University–Savannah Online	15	1%
32	47		Strayer University–Virginia	28	7%
33	45	46	Arizona State University Digital Immersion	26	8%
34	43		Los Angeles Pacific University	23	25%
35	24		Brigham Young University–Hawaii	16	27%

Appendix K: Small Class Sample's Instructional Expenditures Per Student

Class Size and Instructional Expenditure Per Student

Sample Item No.	Population Item No. Selected	Duplicate Item Replaced With Next Item on the List	College	Student-to-Teacher Ratio	Instructional Expenditure Per Student
1	87		West Virginia Wesleyan College	12	$ 6,603.00
2	95		Laguna College of Art and Design	12	$ 10,929.00
3	27		America Evangelical University	6	$ 6,179.00
4	61		Lesley University	9	$ 12,453.00
5	96		Lake Forest College	12	$ 11,242.00
6	35		United States Sports Academy	7	$ 9,518.00
7	2		Middlebury Institute of International Studies–Monterey	1	$ 15,217.00
8	63		Rhodes College	9	$ 15,801.00
9	10		Antioch University–Seattle	3	$ 11,204.00
10	66		Mount Holyoke College	9	$ 25,056.00
11	79		University of Portland	11	$ 14,060.00
12	19		Boston Architectural College	5	$ 10,537.00
13	88		Pentecostal Theological Seminary	12	$ 6,712.00
14	23		National University of National Medicine	5	$ 15,128.00
15	82		Georgetown University	11	$ 31,957.00
16	59		Turtle Mountain Community College	9	$ 11,656.00
17	22		University of the West	5	$ 12,523.00
18	94		Drew University	12	$ 10,779.00
19	48		Randolph College	8	$ 17,635.00
20	34		Antioch University–Santa Barbara	7	$ 8,778.00
21	1		Sioux Falls Seminary	1	$ 4,051.00
22	36		Holy Names University	7	$ 10,120.00
23	63	65	Berklee College of Music	9	$ 20,709.00
24	28		Cleveland Institute of Music	6	$ 29,283.00
25	71		Loyola Marymount University	10	$ 18,413.00
26	26		Nazarene Bible College	6	$ 5,718.00
27	29		Franklin W Olin College of Engineering	6	$ 32,824.00
28	64		Washington College	9	$ 17,278.00
29	8		Abraham Lincoln University	3	$ 398.00
30	75		Johnson and Wales University–Online	11	$ 5,156.00
31	59	60	Bergin University of Canine Studies	9	$ 11,890.00
32	99		Loyola University Maryland	12	$ 12,596.00

Sample Item No.	Population Item No. Selected	Duplicate Item Replaced With Next Item on the List	College	Student-to-Teacher Ratio	Instructional Expenditure Per Student
33	24		Harvard University	5	$ 45,396.00
34	83		Columbia College Hollywood	12	$ 4,529.00
35	75	76	ASA College	11	$ 5,596.00

Appendix L: Large Class Sample's Instructional Expenditures Per Student

Class Size and Instructional Expenditure Per Student

Sample Item No.	Population Item No. Selected	Duplicate Item Replaced With Next Item on the List	College	Student-to-Teacher Ratio	Instructional Expenditure Per Student
1	62		California State University–Monterey Bay	23	$ 9,150
2	93		National Paralegal College	39	$ 1,160
3	58		Brandman University	22	$ 4,159
4	92		Relay Graduate School of Theology	35	$ 6,657
5	76		Purdue University Global	28	$ 1,402
6	11		University of Baltimore	13	$ 13,451
7	72		Strayer University–Georgia	28	$ 1,284
8	1		Amridge University	13	$ 3,664
9	45		American College of Healthcare Sciences	19	$ 1,593
10	78		Strayer University–New Jersey	28	$ 1,548
11	60		Los Angeles Pacific University	23	$ 1,865
12	68		Strayer University–West Virginia	28	$ 1,171
13	97		Western Governors University	42	$ 3,085
14	57		Virginia Union University	21	$ 6,952
15	99		University of Florida Online	49	$ 4,133
16	58	59	American Public University System	23	$ 1,732
17	98		American InterContinental University	43	$ 1,389
18	47		University of Wisconsin–Parkside Flex	19	$ 3,787
19	1	2	Franklin University	13	$ 4,588
20	99	100	University of Florida Online	49	$ 4,133
21	38		Paul Quinn College	18	$ 2,745
22	68	69	Strayer University–Alabama	28	$ 1,241
23	89		Vista College–Online	32	$ 1,277
24	66		Strayer University–Tennessee	28	$ 1,070
25	77		Strayer University–Mississippi	28	$ 1,467
26	38	39	University of Wisconsin–Milwaukee Flex	18	$ 3,330
27	46		Walden University	19	$ 3,039
28	85		Plaza College	28	$ 4,748
29	56		Tarleton State University	21	$ 6,231
30	22		Unity College	15	$ 5,510
31	15		Life University	14	$ 6,046
32	5		Peirce College	13	$ 7,364
33	67		Strayer University–Arkansas	28	$ 1,093
34	84		Strayer University–District of Columbia	28	$ 3,519
35	45	48	Clark Atlanta University	19	$ 7,106

Appendix M: Average Online Class Size

Population Item No.	College	Student-to-Teacher Ratio	Graduation Rate B.A. Within 4 Years
1	Ashford University	15	1%
2	South University–Savannah Online	15	1%
3	American University of Puerto Rico	15	3%
4	Boston Architectural College	5	4%
5	Universidad Central de Bayamon	18	4%
6	New School of Architecture and Design	8	6%
7	Strayer University–Virginia	28	7%
8	Paine College	5	7%
9	Iglobal University	8	7%
10	University of Puerto Rico–Bayamon	21	8%
11	Arizona State University Digital Immersion	26	8%
12	Morris College	12	8%
13	Jarvis Christian College	12	9%
14	University of the West	5	10%
15	National Paralegal College	39	10%
16	American InterContinental University	43	11%
17	Paul Quinn College	18	11%
18	Independence University	33	12%
19	Warner Pacific University Professional and Graduate Studies	20	12%
20	Grantham University	18	13%
21	Purdue University Global	28	14%
22	Life University	14	14%
23	Columbia Southern University	39	15%
24	Virginia University of Lynchburg	14	16%
25	University of the People	17	16%
26	Marymount California University	18	17%
27	Bennett College	7	17%
28	Turtle Mountain Community College	9	17%
29	Harrisburg University of Science and Technology	19	17%
30	Colorado Technical University–Colorado Springs	31	17%
31	University of Baltimore	13	20%
32	Huston-Tillotson University	16	21%
33	Virginia Union University	21	21%
34	Cogswell University of Silicon Valley	14	22%
35	Life Pacific University	12	23%
36	Thomas University	12	23%
37	East Central University	18	25%

Population Item No.	College	Student-to-Teacher Ratio	Graduation Rate B.A. Within 4 Years
38	Conservatory Music of Puerto Rico	7	25%
39	Amridge University	13	25%
40	Presbyterian Theological Seminary in America	6	25%
41	Los Angeles Pacific University	23	25%
42	Columbia College Hollywood	12	27%
43	Brigham Young University–Hawaii	16	27%
44	Holy Names University	7	27%
45	American Public University System	23	27%
46	CUNY Brooklyn College	17	28%
47	Clark Atlanta University	19	28%
48	Providence Christian College	17	29%
49	California State University–Monterey Bay	23	29%
50	California State Polytechnic University–Pomona	29	30%
51	Tarleton State University	21	30%
52	Remington College–Heathrow Campus	9	31%
53	St. Francis College	15	32%
54	Voorhees College	11	32%
55	Western Governors University	42	32%
56	New York Film Academy	9	33%
57	University of Management and Technology	9	33%
58	Art Center College of Design	8	33%
59	Veritas Baptist College	9	33%
60	Wilson College	12	35%
61	Carleigh Dickinson University–Metropolitan Campus	15	38%
62	Franklin University	13	39%
63	Oglethorpe University	18	40%
64	Morehouse College	15	40%
65	Unity College	15	43%
66	Becker College	12	44%
67	Laguna College of Art and Design	12	44%
68	CUNY Bernand M Baruch College	20	45%
69	Bryan University	39	45%
70	Menlo College	17	46%
71	West Virginia Wesleyan College	12	47%
72	Lesley University	9	47%
73	Dean College	16	49%
74	North American University	14	49%
75	Strayer University–South Carolina	28	50%

Population Item No.	College	Student-to-Teacher Ratio	Graduation Rate B.A. Within 4 Years
76	The University of the Arts	9	50%
77	Azusa Pacific University	10	51%
78	St. John's College	7	52%
79	Randolph College	8	52%
80	University of La Verne	15	53%
81	Fairleigh Dickenson University–Florham Campus	13	53%
82	Emmanuel College	13	56%
83	Curtis Institute of Music	2	56%
84	Berklee College of Music	9	57%
85	Humphreys University–Stockton and Modesto Campuses	12	60%
86	University of Florida Online	49	63%
87	University of Redlands	12	63%
88	St. John College	7	64%
89	Drew University	12	64%
90	Maryland Institute College of Art	8	64%
91	Salem College	15	64%
92	Cleveland Institute of Music	6	65%
93	Spelman College	11	65%
94	John Carroll University	13	67%
95	Strayer University–Florida	28	67%
96	Agnes Scott College	11	68%
97	Lake Forest College	12	69%
98	Washington College	9	69%
99	Assumption University	13	70%
100	Kalamazoo College	13	72%
101	Loyola Maymount University	10	75%
102	University of Portland	11	76%
103	Loyola University Maryland	12	77%
104	Occidental College	8	78%
105	Rhodes College	9	79%
106	Pepperdine University	13	80%
107	Franklin W Olin College of Engineering	6	80%
108	Mount Holyoke College	9	80%
109	Claremont McKenna College	8	81%
110	Smith College	7	82%
111	Bernard College	9	85%
112	Harvard University	5	86%
113	Lafayette College	9	86%

Population Item No.	College	Student-to-Teacher Ratio	Graduation Rate B.A. Within 4 Years
114	Princeton University	4	90%
115	Georgetown University	11	90%
116	Vista College–Online	32	95%
117	Strayer University–Arkansas	28	100%
118	Polytecnic University of Puerto Rico–Miami	7	100%
119	Strayer University–Delaware	28	100%
120	Strayer University–New Jersey	28	100%
	Average	**15**	
	Median	**13**	

Appendix N: Instructional Expenditures Per Student Per Credit Hour Small Class

Sample Item No.	Population Item No. Selected	Duplicate Item Replaced With Next Item on the List	College	Student-to-Teacher Ratio	Instructional Expenditures Per Student	Instructional Expenditures Per Student Per Credit Hour
1	87		West Virginia Wesleyan College	12	$ 6,603.00	$ 220.10
2	95		Laguna College of Art and Design	12	$ 10,929.00	$ 364.30
3	27		America Evangelical University	6	$ 6,179.00	$ 205.97
4	61		Lesley University	9	$ 12,453.00	$ 415.10
5	96		Lake Forest College	12	$ 11,242.00	$ 374.73
6	35		United States Sports Academy	7	$ 9,518.00	$ 317.27
7	2		Middlebury Institute of International Studies–Monterey	1	$ 15,217.00	$ 507.23
8	63		Rhodes College	9	$ 15,801.00	$ 526.70
9	10		Antioch University–Seattle	3	$ 11,204.00	$ 373.47
10	66		Mount Holyoke College	9	$ 25,056.00	$ 835.20
11	79		University of Portland	11	$ 14,060.00	$ 468.67
12	19		Boston Architectural College	5	$ 10,537.00	$ 351.23
13	88		Pentecostal Theological Seminary	12	$ 6,712.00	$ 223.73
14	23		National University of National Medicine	5	$ 15,128.00	$ 504.27
15	82		Georgetown University	11	$ 31,957.00	$ 1,065.23
16	59		Turtle Mountain Community College	9	$ 11,656.00	$ 388.53
17	22		University of the West	5	$ 12,523.00	$ 417.43
18	94		Drew University	12	$ 10,779.00	$ 359.30
19	48		Randolph College	8	$ 17,635.00	$ 587.83
20	34		Antioch University–Santa Barbara	7	$ 8,778.00	$ 292.60
21	1		Sioux Falls Seminary	1	$ 4,051.00	$ 135.03
22	36		Holy Names University	7	$ 10,120.00	$ 337.33
23	63	65	Berklee College of Music	9	$ 20,709.00	$ 690.30
24	28		Cleveland Institute of Music	6	$ 29,283.00	$ 976.10

Sample Item No.	Population Item No. Selected	Duplicate Item Replaced With Next Item on the List	College	Student-to-Teacher Ratio	Instructional Expenditures Per Student	Instructional Expenditures Per Student Per Credit Hour
25	71		Loyola Maymount University	10	$ 18,413.00	$ 613.77
26	26		Nazarene Bible College	6	$ 5,718.00	$ 190.60
27	29		Franklin W Olin College of Engineering	6	$ 32,824.00	$ 1,094.13
28	64		Washington College	9	$ 17,278.00	$ 575.93
29	8		Abraham Lincoln University	3	$ 398.00	$ 13.27
30	75		Johnson and Wales University–Online	11	$ 5,156.00	$ 171.87
31	59	60	Bergin University of Canine Studies	9	$ 11,890.00	$ 396.33
32	99		Loyola University Maryland	12	$ 12,596.00	$ 419.87
33	24		Harvard University	5	$ 45,396.00	$ 1,513.20
34	83		Columbia College Hollywood	12	$ 4,529.00	$ 150.97
35	75	76	ASA College	11	$ 5,596.00	$ 186.53
			Average		**$ 13,941**	**$ 465**

Appendix O: Instructional Expenditures Per Student Per Credit Hour Large Class

Sample Item No.	Population Item No. Selected	Duplicate Item Replaced With Next Item on the List	College	Student-to-Teacher Ratio	Instructional Expenditure Per Student	Instructional Expenditure Per Student Per Credit Hour
1	62		California State University–Monterey Bay	23	$ 9,150	$ 305
2	93		National Paralegal College	39	$ 1,160	$ 39
3	58		Brandman University	22	$ 4,159	$ 139
4	92		Relay Graduate School of Theology	35	$ 6,657	$ 222
5	76		Purdue University Global	28	$ 1,402	$ 47
6	11		University of Baltimore	13	$ 13,451	$ 448
7	72		Strayer University–Georgia	28	$ 1,284	$ 43
8	1		Amridge University	13	$ 3,664	$ 122
9	45		American College of Healthcare Sciences	19	$ 1,593	$ 53
10	78		Strayer University–New Jersey	28	$ 1,548	$ 52
11	60		Los Angeles Pacific University	23	$ 1,865	$ 62
12	68		Strayer University–West Virginia	28	$ 1,171	$ 39
13	97		Western Governors University	42	$ 3,085	$ 103
14	57		Virginia Union University	21	$ 6,952	$ 232
15	99		University of Florida Online	49	$ 4,133	$ 138
16	58	59	American Public University System	23	$ 1,732	$ 58
17	98		American InterContinental University	43	$ 1,389	$ 46
18	47		University of Wisconsin–Parkside Flex	19	$ 3,787	$ 126
19	1	2	Franklin University	13	$ 4,588	$ 153
20	99	100	University of Florida Online	49	$ 4,133	$ 138
21	38		Paul Quinn College	18	$ 2,745	$ 92
22	68	69	Strayer University–Alabama	28	$ 1,241	$ 41
23	89		Vista College - Online	32	$ 1,277	$ 43

Sample Item No.	Population Item No. Selected	Duplicate Item Replaced With Next Item on the List	College	Student-to-Teacher Ratio	Instructional Expenditure Per Student	Instructional Expenditure Per Student Per Credit Hour
24	66		Strayer University–Tennessee	28	$ 1,070	$ 36
25	77		Strayer University–Mississippi	28	$ 1,467	$ 49
26	38	39	University of Wisconsin–Milwaukee Flex	18	$ 3,330	$ 111
27	46		Walden University	19	$ 3,039	$ 101
28	85		Plaza College	28	$ 4,748	$ 158
29	56		Tarleton State University	21	$ 6,231	$ 208
30	22		Unity College	15	$ 5,510	$ 184
31	15		Life University	14	$ 6,046	$ 202
32	5		Peirce College	13	$ 7,364	$ 245
33	67		Strayer University–Arkansas	28	$ 1,093	$ 36
34	84		Strayer University–District of Columbia	28	$ 3,519	$ 117
35	45	48	Clark Atlanta University	19	$ 7,106	$ 237
			Average		**$ 3,791**	**$ 126**

Appendix P: ACU IRB Approval

Date: July 26, 2023

PI: Getachew Wakgira

Department: ONL-Online Student, 17250-EdD Online

Re: Initial - IRB-2023-100

Academic Achievements of Online Accounting Students in Small and Large Classes

The Abilene Christian University Institutional Review Board has rendered the decision below for *Academic Achievements of Online Accounting Students in Small and Large Classes* .

Decision: No Human Subjects Research

Research Notes:

Additional Approvals/Instructions:

Any modifications to the approved study must be submitted for review through Cayuse IRB. All approval letters and study documents are located within the Study Details in Cayuse IRB.

Sincerely,

Abilene Christian University Institutional Review Board