Comparing Student Cumulative Course Grades, Attrition, and Satisfaction in Traditional and Virtual Classroom Environments

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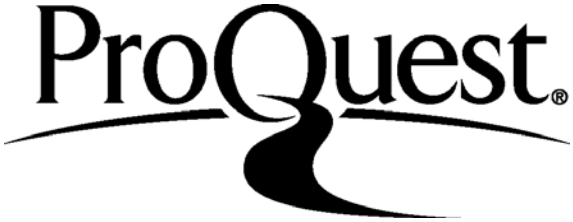

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Abstract

Higher education institutions are quickly becoming oriented to the benefits of distance education to their long-term interests. However, higher dropout rates continue to trouble distance-learning approaches despite the supposed flexibility and convenience it offers its students. Distance learning can be either synchronous or asynchronous in delivery. The problem addressed in this study is the significantly higher dropout rates of students in distance-learning classrooms as compared to traditional classrooms. Recent technology breakthroughs have enabled a relatively new, previously unfeasible category of distance learning—a synchronous venue using high-speed internet, modern interactive software, webcam and display tools, and computer-based activities and interactions between instructors and students in non-collocated classrooms—referred to as live virtual classrooms. The purpose of this quantitative quasi-experimental study was to compare student outcomes (student performance, satisfaction, and attrition rates) from a synchronous live virtual classroom to outcomes from an equivalent traditional classroom. This was the first comparative study of student outcomes (student performance, satisfaction, and attrition rates) in a live virtual classroom versus a traditional classroom at a major national-level university. The study aimed to capitalize on this comparison of student outcomes in live virtual classrooms versus traditional classrooms to determine if the incorporation of synchronous tools in distance education could improve upon the common issues that cause students to exit their distance learning programs by bridging the communication gaps between instructors and students. The theoretical framework for this dissertation is rooted in Michael G. Moore's theory of transactional distance as a key variable for eliciting student engagement in the classroom. The research questions were

derived to assist college university leadership with virtual and traditional classroom student retention challenges and determine possible reasons for any observed differences in student retention for different classroom venues. The population consisted of approximately 1,000 graduate students who attended five core courses of a specific post-graduate program, and was further narrowed to students who have taken at least two virtual classroom core classes and at least two traditional classroom core classes. The results of this study, which used MANCOVA and a Mann-Whitney *U* test for differences, were used to determine that there is a student preference ($p < .05$) for traditional classroom over live virtual classroom venue. No significant differences were found in student performance or attrition rate using the same statistical tests. There were no student satisfaction data indicating reasons for this preference. Last, amplifying free-form comments from the survey identified dissatisfaction caused by distractions associated with live virtual technology issues during classes. Therefore, it can be concluded that there were some differences in student satisfaction of traditional classroom venue versus live virtual classroom, but that satisfaction is not translated into performance differences or differences in attrition rate. From this study, the virtual live classroom appears to function equally well as the traditional classroom when measured by grades, satisfaction, and attrition. Future research recommendations include quantitative and qualitative evaluation of the different styles of live virtual classrooms that are evolving as a result of technology improvements and student and instructor technical savvy. Also, expanding the sample population beyond post-graduate students may further delineate the level of appeal from the various live-virtual instruments in that particular classroom venue.

Approval Page

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Table of Contents

List of Tables

Chapter 1: Introduction

Distance learning has the primary goal of providing instruction to students in a way that promotes the convenience of the learners; this is despite the distinction established by the geographical and psychological separation that exists between them and their instructors (Moore & Kearsley, 1996). With technologies quickly advancing, global trends continue to change, including global economies, corporate and managerial approaches, and educational systems. In recognition of these evolutions, higher education systems across the globe are eager to adapt to these changes through the application of tools and strategies that modernize education (Guri-Rosenblit, 2005).

The opportunities for distance learning continue to grow along with the rapid improvements in technology, with courses being taught online for the benefit of students who cannot be physically present on campuses due to a variety of external commitments (Kim, Lee, & Skellenger, 2012). Distance learning has received wide attention in recent decades. It has become a large part of the global educational population with 1.6 million students reportedly taking at least one online course in the year 2002 representing 9.6% of the total college enrollment that year (Bradley, 2011). Moreover, higher education institutions are quickly becoming oriented to the benefits of distance education to their long-term interests as technologies continue to be integrated in the lives of people all around the world (Allen & Seaman, 2011) as evidenced by the increased ownership of personal technology in recent years (Andrews & Tynan, 2012).

However, higher dropout rates continue to trouble distance education approaches despite the supposed flexibility and convenience it offers its students. The retention rates of distance-learning environments are consistently lower than traditional learning

environments across disciplines and levels of study (Gascoigne & Parnell, 2014). Several studies detailing this problem have pointed to issues with self-efficacy, persistence, and other personal barriers as some of the main reasons for students' decisions to leave distance learning (Boston, Ice, & Gibson, 2011; Hartnett, St. George, & Dron, 2011; Nichols, 2011; Wingreen & Moorman, 2011); whereas some other studies point to external factors like institutional support, instructor performance and immediacy, and interactions as potential points of observation with regards to students' decisions to pursue distance education (Baker, 2010; McKerlich, Riis, Anderson, & Eastman, 2011).

Moreover, a large portion of the studies dedicated towards understanding the reasons behind high attrition rates in distance learning agree that interaction plays a significant role in the motivation of students to stay in their courses. This study aimed to capitalize on these findings by analyzing how the incorporation of synchronous tools in distance education could improve upon the common issues that cause students to exit their distance-learning programs by bridging the communication gaps between instructors and students. This builds upon Moore's (1993) transactional distance theory that emphasized the importance of dialogue in the success of any event where the transactional distance–in this case, the psychological distance brought about by the geographical separation–is typically high.

Background

The presence of new technologies in distance learning has altered the ways through which students interact with both their teachers and their classmates (Kaminski, Switzer, & Gloeckner, 2009). One of these new technologies is distance learning, which is an educational delivery method that brings together participants who are separated

from each other through geographical location (Filimban, 2008). This geographical separation between students and instructors frees students from the previously necessary ordeal of traveling to certain, pre-arranged locations at fixed times to get together with a specific instructor (Allen & Seaman, 2011).

Distance learning can be either synchronous or asynchronous in delivery (Martin, Parker, & Deale, 2012). In distance learning, synchronous delivery involves live interaction between all participants, which may include a traditional classroom, video or audio teleconferencing, a communal whiteboard, and live interactive chat rooms (Filimban, 2008). Asynchronous delivery involves an interaction wherein students and instructors do not participate at the same time and place, such as through e-mail, videotape, and Internet-based platforms. Both synchronous and asynchronous instructional practices have been used at traditional and online schools and universities.

Despite the flexibility offered in distance learning, there is a significantly higher dropout rate for students in distance learning compared to traditional classroom setting (Allen & Seaman, 2011). Lack of teacher-immediacy, teacher presence, and student interaction with teachers and other students could explain the high attrition in distance learning (Martin et al., 2012). Distance-learning students and traditional students reported their interactions with other students at the institution as less frequent in quantity when compared to on-campus face-to-face students, confirming concerns that student isolation may be a byproduct of distance learning (Rabe-Hemp, Woolen, & Humiston, 2009).

Rabe-Hemp et al. (2009) observed that most of the objections leveled against distance-learning courses were due to concerns surrounding the ways faculty and students

would interact. However, the concerns about faculty-student relations were less frequent and less specific as compared to the traditional classroom setting (Rabe-Hemp et al., 2009). Teacher-student and student-peer interaction are essential to the learning process and are the center point of most situations within an educational context (Rabe-Hemp et al., 2009). In addition, students who have reported experiencing high levels of interaction with other students have also indicated feeling greater general course satisfaction, and also feeling that their learning has been of a higher caliber (Lavolette, Venable, Gose, & Huang, 2010).

Synchronous online sessions have been shown by some scholars to produce more perceptions of closeness or immediacy than asynchronous communication alone (Baker, 2010). Students in asynchronous distance-learning courses stated that their interactions with their classmates were much lower, as compared to their counterparts in traditional learning; they mentioned that they discussed concepts outside of class less often than traditional students (Rabe-Hemp et al., 2009). The reduced learning that is suggested by such findings may be a result of the lack of student interaction during asynchronous distance-learning courses. Through synchronous learning platforms, distance learning has the potential to reduce transactional distance between instructors and students in online courses, possibly addressing the high attrition rate in distance learning.

Statement of the Problem

The problem addressed in this study is the significantly higher dropout rates of students in distance-learning classrooms as compared to traditional classrooms (Allen & Seaman, 2011). These higher dropout rates for students appear to be related to key elements of transactional distance theory measures, such as teacher immediacy, teacher

presence, and student interaction (Martin et al., 2012). However, these transactional distance measures can now be improved through recent developments in computer software, hardware, broadband technology, and infrastructure; these allow new virtual classrooms of non-collocated students and instructors in a synchronous venue (Lavolette et al., 2010). These live virtual classrooms may combine all the benefits of traditional live instruction with the ease and convenience of distance learning. Despite the promise of these new developments in online learning, the live virtual classroom has not yet been properly evaluated against its traditional live counterpart.

To assess efficacy of the live synchronous virtual classroom against the more traditional classroom, student outcomes (student performance, satisfaction, and attrition rates) in the live synchronous virtual classroom were examined as compared to the traditional classroom. The research conducted directly compared student outcomes for students who have enrolled in both live virtual classrooms and traditional classrooms. For this study, the student population was filtered so that all sample students had taken two virtual classroom classes and two traditional classroom classes. The instructors were the same for the courses to be compared. This was the first comparative study of student outcomes (student performance, satisfaction, and attrition rates) in a live virtual classroom versus a traditional classroom at a major national-level university.

Purpose of the Study

The purpose of this quantitative quasi-experimental first time study was to compare student outcomes (student performance, satisfaction, and attrition rates) from a live virtual classroom to outcomes from an equivalent traditional classroom at a major national-level university. The virtual classroom consisted of non-collocated students and

instructors who used modern software (computers, projectors, webcams, and broadband level bandwidth) to form a synchronous learning environment. The target population was approximately 1,000 graduate students attending five core courses for a specific post-graduate degree at a major national university, conducting classes in both geographically separated campus traditional classrooms and live virtual classrooms. According to the G*Power analysis (discussed below), the required sample size was 35 participants in each group.

The independent variable in this study was the venue of instruction: live virtual classroom, or traditional classroom. There were three dependent variables in this study: student performance during the course, which were measured by grades given by the teacher; student satisfaction, which were measured by the end-of-course survey that each student was given the opportunity to fill out; and student attrition rate, which was measured by comparing the respective attrition rates of virtual and traditional classrooms after the first week of class—which is the normal add/drop period at this particular university. All three dependent variables were quantitatively evaluated using the Mann-Whitney *U* test for differences as well as a multivariate analysis of covariance (MANCOVA) with NCSS statistical analysis software (Hintze, 2013).

Theoretical Framework

The theoretical framework for this dissertation was rooted in Michael G. Moore's theory of transactional distance (Moore, 1993; Moore & Kearsley, 1996) as a key variable for eliciting student engagement in the classroom. Transactional distance is defined as "the psychological and communication space that exists between learners and instructors in distance education" (Moore, 1993, p. 22). The theory asserts that the

quality of teaching, learning, and interactions among participants is not affected at the same level by geographical separation as it is by the structure of the course and the quantity and quality of the interactions that happen in that structure (Moore & Kearsley, 1996). Moore (1993) delineated three clusters of variables as aspects of transactional distance: dialogue, course structure, and learner. These theoretical assumptions allow one to make explicit those elements of distance learning that most significantly facilitate learning as well as those factors that impede learning in distance-learning contexts. If learning is a transaction among participants, then the physical separation in distance learning may lead to potential misunderstandings or communication gap; what Moore (1993) labeled transactional distance. Accordingly, it has been noted that an increase in dialogue between the instructors and students lessens the degree of transactional distance (Moore & Kearsley, 1996). The theory predicts that communication gaps and potential for misunderstandings between the teachers and students are a significant factor in students dropping out from distance-learning courses (Moore & Kearsley, 1996).

One of the factors militating against dropout, therefore, is dialogue, which includes all forms of interaction beyond simple two-way communication (Moore & Kearsley, 1996). Moore's (1993) theory is very useful as a means to evaluate the utility of employing a live virtual classroom in distance learning to increase the occurrence of dialogue and reduce transactional distance (Falloon, 2011). Furthering this concept, student perception of transactional presence (the perception of availability of, and an attachment with, each participant) has been identified as a vital predictor of success in students in distance learning (Shin, 2003). A perception of presence was found to predict

the specific measures that have to do with succeeding in distance learning, including perception of achieving learning, a persistence to learn, and satisfaction (Shin, 2003).

Gorsky and Caspi (2005, 2009) criticized the theory of transactional distance because the theory makes use of tautological reasoning, wherein dialogue has been taken to represent learner understanding, and transactional distance representing a level of misunderstanding. Goel, Zhang, and Templeton (2012) refuted these criticisms, noting that Moore emphasized the subjective nature of transactional distance adequately in his writing. Giossos, Koutsouba, Lionarakis, and Skavantzos (2009) noted that transactional distance is something that is experienced and perceived subjectively, in various ways that differ between cultures and individuals: transactional distance as a concept is not absolute, it is an experience that varies from individual to individual. It has also been noted that an investigation of the two sub-variables of dialogue (social presence and immediacy) may produce a clearer definition of this construct. However, in an analysis of transactional distance as a predictor for student intention to subscribe to e-learning courses in the future, Goel et al. (2012) found that it did not appraise these two variables directly.

In a study of the perceptions of students regarding transactional presence, Naylor and Wilson (2009) found frequency of interaction to be an important but not solely determinant factor in student satisfaction—students must be satisfied with the quality of interaction as well. This includes a sense of relationship with peers and instructors (Naylor & Wilson, 2009). Baker (2010) compared instructor presence with instructor immediacy. Immediacy includes starting discussions, asking thoughtful questions, employing self-disclosure, calling students by their name, repeating contacts with

students over time, and other verbally immediate behaviors that signal expressiveness, engagement, accessibility, and politeness.

Baker (2010) identified a positive statistical relationship between instructor immediacy and instructor presence in an online learning environment ($r = .75$, $p < .01$). Furthermore, students' ability to interact with the instructor (linear combination of instructor immediacy and presence) was related to motivation, affective learning, and cognition in the distance-learning environment (motivation, $R2 = .38$; affective learning, $R2 = .56$; cognition, $R2 = .46$) (Baker, 2010). While research also revealed instructor presence was a significant individual predictor of all three, instructor immediacy was not (Baker, 2010). Also, students in synchronous courses were more inclined to perceive their instructors as possessing higher rates of presence, as opposed to their counterparts in asynchronous courses, further substantiating the importance of synchronous activities in distance-learning courses to increase student motivation (Baker, 2010).

The transactional distance theory is important for this proposed dissertation project since it gives a potential answer for why the utilization of relatively modern and alternate means of electronic communication tools reduces the communications gaps in a distance-learning environment. These modern electronic communication tools increase interaction levels, thus reducing psychological barriers and increasing social interactions similar to the face-to-face classroom (Baker, 2010). Transactional distance and presence was shown to be predictors for student motivation. Student motivation was shown to be related positively to student outcomes. In the present study, student outcomes (student performance, student satisfaction surveys, and student attrition rate) were directly measured and compared for both a live virtual classroom and a traditional classroom. To

the extent that transactional distance was reduced and presence was strengthened via the use of the live virtual classroom technology platform, Moore's (1993) theory would predict equivalent or better student outcomes for this in the virtual live classroom relative to the traditional classroom setting.

Research Questions

The goal of the proposed investigation was to compare a live virtual classroom with a traditional classroom in terms of student academic performance, student satisfaction, and student attrition rate. The research questions were derived to assist college university leadership with virtual and traditional classroom student retention challenges and determine possible reasons for any observed differences in student retention for different classroom venues. The following research questions focus on student outcomes in virtual and traditional classroom environments:

Q1. What difference exists, if any, in the cumulative course grades between live virtual classrooms and traditional classrooms?

Q2. What difference exists, if any, in the level of student satisfaction between live virtual classrooms and traditional classrooms?

Q3. What difference exists, if any, in the level of student attrition rate between live virtual classrooms and traditional classrooms?

Hypotheses

$H1_0$. There is no difference in the cumulative course grades between live virtual classrooms and traditional classrooms after controlling for age, grade point average (GPA), gender, and socioeconomic status.

$H1_a$. There is a significant difference in the cumulative course grades between live virtual classrooms and traditional classrooms after controlling for age, GPA, gender, and socioeconomic status.

$H2_0$. There is no difference in the level of student satisfaction between live virtual classrooms and traditional classrooms.

$H2_a$. There is a significant difference in the level of student satisfaction between live virtual classrooms and traditional classrooms.

$H3_0$. There is no difference in the level of student attrition between live virtual classrooms and traditional classrooms after controlling for age, GPA, gender, and socioeconomic status.

$H3_a$. There is a significant difference in the level of student attrition rate between live virtual classrooms and traditional classrooms after controlling for age, GPA, gender, and socioeconomic status.

Nature of the Study

This study used a quantitative quasi-experimental research design. This design was chosen because quasi-experimental designs are often utilized to test descriptive hypotheses about potential causes that could still be manipulated through experimentation (Shadish, Cook, & Campbell, 2002). Because the study sought to compare two modalities—a virtual classroom and a traditional classroom—an instruction-related independent variable was controlled across the control and comparison groups of the study (Minner, Levy, & Century, 2010).

The study had the mode of instruction as the manipulated variable and the causal impact of this control variable will be observed against the subsequent performance of

the students as well as their satisfaction with the course or their potential attrition. The research was quasi-experimental because it is useful for cases when randomization is not a feasible approach (DeRue, Nahrang, Hollenback, & Workman, 2012). The samples were not randomly assigned into the control or comparison groups; rather, the students chose the mode of instruction they were a part of.

Two groups of 35 students each served as the sample for the study with the two groups representing the two modalities being compared in this study. The variables observed were the performances of the students (as measured by their grades) and student satisfaction (as measured by a post-course survey). The attrition of the students was also studied as a comparison of student attrition rates between the two groups after the first week of classes. The data will was analyzed using the Mann-Whitney *U* test for differences, while the MANCOVA was used to assess the changes in the scores of the dependent variables depending on the mode of instruction while controlling for confounding variables (age, GPA, gender, and socioeconomic status).

Significance of the Study

Due to the increasingly technological nature across the world, global trends are continuously changing along with approaches to business, management, and even education. Distance learning is gaining steady attention from higher education institutions aiming to adapt to these technological advancements. It is particularly popular with adult learners who have external commitments that limit their capability of regularly attending campus-based courses (Kim et al., 2012).

It has seen positive applications in several cases in the past, particularly in asynchronous formats of distance instruction; however, the unique component of

transactional distance introduces issues that make the facilitation of distance education more complicated than traditional education in certain cases. Although it poses a lot of benefits in terms of flexibility and adaptability, distance learning continues to suffer issues with the retention of students under the wing of the institution. A relatively large number of students end up not completing their courses due to several possible external or internal factors like persistence, motivation, quality of interactions, structure of the course, and the level of autonomy of the student, among others.

This study aimed to address this issue by laying down an understanding of the factors that influence the students' decisions for leaving their programs and how these can be amended. It has been observed largely in literature that interaction is the most important aspect of distance education because no learning can occur without the existence of interactions between students and instructors as well as between students and students. The primary objective of this study was to identify the efficacy of synchronous tools used in virtual classrooms as against traditional classes.

This could benefit facilitators of distance education by addressing the effectiveness or non-effectiveness of synchronous distance education in teaching students in a way that achieves their learning objectives in an enthusiastic and driven manner. By identifying the strengths and weaknesses of the synchronous virtual classroom, higher education institutions have the first basis of comparison of traditional learning systems and actual live virtual classrooms that mimic the nature of the traditional classroom. This serves as a scaffold for future research efforts aiming to improve distance learning to a level that could equal the efficacy of traditional classrooms and potentially decrease attrition rates as a result.

Definition of Key Terms

Asynchronous communications. Communications in the learning environment not requiring live-interaction between student and instructor; instead, students conduct learning with the use of mail, electronic mail, the Internet, and videotape (Patti, 2010).

Attrition. The student attrition is defined as the percentage of students who discontinue their present classroom course (Kyger, 2008).

Distance learning. The student and instructor are separated by any distance and all communications are mediated by some type of electronic means in real or delayed time (Patti, 2010).

E-learning. Distance learning using electronic media such as a computer for exchange of material and ideas (Patti, 2010).

Performance. Student performance is defined as the cumulative course grades of students for the academic year (Patti, 2010).

Synchronous communications. Communication with real time participation and interactions between students and instructors with the use of television, audio and video conferencing, shared whiteboard, and Internet chats, or in a live classroom (Filimban, 2008).

Traditional classroom instruction. A classroom venue where students and teachers meet in a classroom and in-person interactions take place between the learners and the instructors, and between the learners themselves (Chernish, DeFranco, Lindner, & Dooley, 2009).

Virtual classroom instruction. A classroom venue where students and teachers do not meet in person, but rather use alternative synchronous communications methods for classroom instruction and interaction (Patti, 2010).

Summary

Distance learning shows a lot of potential and has shown positive applications in previous research efforts; however, there is still much to be learned about the factors that affect a student's motivation to stay in a distance-learning course and how these factors can be mitigated to ensure the students' course completion. While distance education continues its growth in higher education, the need for ensuring the attrition of students becomes more vital to an institution's growth. This impresses the need for understanding the reason behind students as a part of the strategies of any higher education institution aiming to grow along with the speedy evolution of technology.

Distance learning has been delivered in asynchronous and synchronous formats. The asynchronous format often involves interaction that does not require participants to meet at the same time and is normally conducted using communication platforms like e-mail or videotaping. Synchronous formats, on the other hand, provide more live interaction between the students and with their instructors. Studies have shown that communication issues typically plague distance learning and this could readily impede a student's development process.

With the greater part of distance-learning literature addressing the impact of interactions and immediacy to the motivation and persistence of a student to complete his/her distance-learning program, there is a perceptible gain in having a greater understanding of the application of synchronous distance education and how it can bridge

the gaps created by the transactional distance between learners and their teachers. There is a potential for observing its application in a national-level university to serve as a foundation for further innovations with regards to the improvement of synchronous distance education as alternatives for the traditional classroom.

Chapter 2: Literature Review

The purpose of this study was to compare student outcomes (student performance, satisfaction, and attrition rates) from a live virtual classroom to outcomes from an equivalent traditional classroom. The virtual classroom consists of non-collocated students and instructors who use modern software (computers, projectors, webcams, and broadband level bandwidth) to form a synchronous learning environment. The traditional classroom consisted of collocated students and instructors in a synchronous learning environment. The context of the review was the changing nature of distance learning, synchronous and asynchronous formats, as well as improved technology to create a live virtual classroom. Documented higher student dropout rates in distance-learning classrooms as compared to traditional classrooms appear to be related to transactional distance (Allen & Seamen, 2011; Martin et al., 2012). Transactional distance theory links student outcomes, satisfaction, and motivation to instructor presence, engagement, and interaction (Falloon, 2011; Moore & Kearsley, 1996). Live virtual classrooms may reduce transactional distance because the synchronous instruction format and modern technology tools sufficiently mirror the traditional classroom, which may improve student outcomes and reduce student dropout rate.

Documentation

Sources for selected review were obtained from the following databases: Academic Video Online, Annual Reviews, Britannica Online, Counseling and Therapy in Video, CredoReference, Ebraray, EBSCOhost, EdIT Digital Library, ERIC, ETS Test Link, Euromonitor International, Films on Demand, Gale Academic OneFile, Journal of the American Medical Association, Journal of Cognitive Psychotherapy, Journal of the

International Neuropsychological Society, Journal of Systemic Therapies, LexisNexis, MEDLINE, Mental Measurements Yearbook with Tests in Print, Mergent Online, Praeger Security International, ProQuest, PsychiatryOnline, Psychological Reports, PsycTESTS, ReferenceUSA, RefWorks, SAGE Journals Online, ScienceDirect, SPORTDiscus with Full Text, SpringerLink, Taylor & Francis Online, Teachers College Record, Ulrichsweb, Web of Knowledge, Wiley Online Library, and WorldCat.

The search utilized the following key words: distance, education, learning, and classroom. These searches returned some ten thousand references. After excluding non-peer reviewed sources and papers published before 2008, over 1,000 references remained. A new search was run among these remaining references using a more restricted keyword search as follows: distance, education, virtual, synchronous, and classroom. This latter search yielded over 800 references. After reading through these abstracts, 200 references were retained and have served as the basis for this literature review.

Distance Learning

Distance learning has been defined in sometimes isolated levels, some only defining it in a manner that deals with student and teacher behavior, some defining it only dealing with the knowledge domain, and some defining it as a composite of the two; however, prior to an operational definition of the term “distance learning”, a proper definition of the term “learning” itself has to be achieved (King, Young, Drivere-Richmond, & Schrader, 2001). King et al. (2001) used the definition of learning as “improved capabilities in knowledge and/or behavior as a result of mediated experiences that are constrained by interactions with the situation” (p. 7). This definition of learning

highlights the importance of the interactive construct in the process of improving the knowledge of the receptors.

Distance learning, in particular, has been defined as any system of education that brings together participants separated by geographical distances or time (Filimban, 2008). According to Moore and Kearsley (1996) in their attempt at creating a theoretical basis for distance education, distance education's fundamental concept is simple: the teacher and the student are separated by distance, and in some cases, by time. Such a learning setup contrasts with the traditional methods of education that entails students and teachers meeting at a given place at a particular time as well as the more contemporary methods of instruction that places teachers and several learners at the same place at the same time. The primary goal of distance education is to provide instruction to students in a manner that is most comfortable tor convenient to the learners. The distinction established by the additional distance component requires a framework that introduces an artificial communication medium into the process that allows the parties to interact with each other (Moore & Kearsley, 1996).

Andrews and Tynan (2012) pointed out that the increase in utilization of information and communications technologies has blurred the definition of distance learning in distinction from other educational methodologies which also utilize similar technologies including—but not limited to—online learning, virtual learning, and e-learning. They provided an operational definition for distance learning as all types of learning that take place where there is no face-to-face interaction involved between the instructor and the learners as well as between learners alike. According to Andrews and

Tynan (2012), all forms of interaction in distance learning are mediated by technological aids.

According to Burgess and Russell (2003), distance learning, although seeming like a relatively contemporary idea, has had a long history characterized by increasing technological interventions but with a consistent intention of increasing the effectiveness of the techniques by means of these technological interventions. The concept of self-study in the form of correspondence courses has been cited in literature as the beginning or the genesis of distance learning (Burgess & Russell, 2003). Such an approach to education relies on print materials as the method of instruction and postal service providers for the communication between the student and the instructor and was utilized for years before the advent of video/audio conferencing and educational television. Systems-based distance learning introduced interactive features into the distance-learning process by the utilizations of many transmission methods like the Internet, print, audio, and video media (Burgess & Russell, 2003) as a way of achieving the training and mentoring objectives of the parties.

Higher education systems all over the world, however, continue to be challenged by the presence of new technologies that impact global trends, economies, corporate management approaches, and the structure of study environments all over the globe. As a result, many have pointed to information and communication technologies as the new generation of distance learning (Guri-Rosenblit, 2005). In this new generation, participants rely upon two-way communications that occur via innovative technologies that create a virtual reality using audio and video technology forming virtual chat rooms as common mediums (Burgess & Russell, 2003).

With the rapid improvements in technology, the possibilities for distance learning have never been more numerous. It has seen an increase in utilization particularly by students in rural areas and for students who cannot afford to leave their jobs or their families to pursue their education (Kim, Lee, & Skellenger, 2012). Many university courses are taught online, and the online format has become increasingly popular with traditional and non-traditional students (Filimban, 2008). According to Allen, Seaman, Lederman, and Jaschik (2012), the rate of student enrollment in distance-learning courses has accelerated more quickly than the overall rates for higher education.

In 2002, the Sloan Consortium's first survey of online students found that more than 1.6 million students took at least one online course, which represented 9.6% of total college enrollment (Bradley, 2011). The 2008 survey showed a 13% growth rate nationwide in distance-learning enrollments (Coleman, 2009). In 2009, 5.6 million students were enrolled in at least one online course, representing 30% of total college enrollments (Bradley, 2011). Nearly 6.1 million students enrolled during 2010, yielding an 18.3% compound annual growth rate (Allen et al., 2012).

Distance learning is also an important part of the national education spectrum, with one-third of institutions of higher learning fully engaged in online education (Allen et al., 2012). Leaders of these institutions of higher learning believe their online offerings are part of a profitable and winning strategy and have completely incorporated distance learning into their long-term agenda (Allen et al., 2012). Furthermore, these same schools enroll 43% of all higher education students, and educate nearly 66% of all distance education students (Allen et al., 2012).

The ownership of personal technology has also increased in recent years; thus, the adoption of information and communication technologies by various institutions has also grown by means of integrating these technologies into the learning experiences of their students (Andrews et al., 2012). Distance learning is a specific tool available for giving educational institution leaders a highly effective method to cut costs and reach students who would otherwise be unable to participate in classes, due to geographical distance (Lewis, 2011). Leaders of traditional institutions of higher learning are financially motivated to embrace distance learning as a method of gaining new students as customers.

Moore & Kearsley (1996) remarked that different technologies, techniques, and types of students entail a need for educational institutions to offer different ways of managing and implementing programs; sometimes going as far as establishing entirely new departments or institutions as a means of embedding distance education within their educational constructs. Andrews (2010) noted previous research projects that compared traditional classroom-based courses to online courses and found that the outcomes of the subjects in terms of GPA, final grades, and eventual licensure passing rates were higher for those who took online classes as part of their training. This highlights the potential of online learning to improve the outcomes of students in comparison to other more traditional mechanisms.

According to Saba (2012), the increase in the popularity of distance education has been consistently present among higher-education administrators and students are becoming increasingly aware of the advantages and flexibility that distance learning has to offer. However, the advancement of technology-based education has been received as

both a boon and a bane because currently existing distance-learning configurations commonly fail to take full advantage of the telecommunication, personalized instruction, and reception that the technology has to offer. Several distance-learning models being utilized offer one-size-fits-all curriculum designs which have the tendency of ignoring the fundamental and personal needs of their clients; as a result, these models fail to improve the learning conditions of their students as well as economizing the cost of education (Saba, 2012).

Despite these accelerating trends in distance learning, there is significant variability in student satisfaction and outcomes for distance-learning formats. The existence and continuous development of cutting-edge technology provides educational institutions with limitless opportunities for instructional innovation. However, previous research efforts have shown that the flexibility, adaptability, and immediacy of distance learning in distance-learning models leave much to be desired in comparison to that of the commonly used traditional face-to-face models for instruction. The following review will explore the strengths and weaknesses of distance learning, provide an analysis of these strengths and weaknesses, and examine the promise of innovations in distance learning formats.

Distance Learning: Synchronous and Asynchronous Formats

Distance learning may be either delivered in synchronous or asynchronous learning formats (Martin et al., 2012). Distance learning was borne out of the initial paradigm of distance education, which was primarily an asynchronous activity, including posting responses on discussion boards, consulting course websites, and uploading course assignments (Allen et al., 2012). Asynchronous formats do not require the students to

meet with the instructor and other students at the same time, but rather access information or complete assignments at a time convenient to the students (Allen et al., 2012). Distance learning also includes usage of prior technologies, such as correspondence courses, educational television, and videoconferencing, which could be both synchronous and asynchronous (Kruger-Ross & Waters, 2013).

Asynchronous delivery of distance education is the more traditional form of distance learning. According to Andrews (2010), asynchronous learning has been found to be effective in setting the environment for the students in a way that challenges them to use higher-ordered thinking capabilities more so than synchronous environments. Asynchronous online teaching, in particular, involves students working with online academic materials during the time they decide upon. Under the guidance of a provided instructor and in such a setup, the students and the teachers are geographically and temporally separated from each other. They are free from any constraints that could typically be posed by being limited to being in the same physical location at the same time. Examples of tools that have been and can be used in the asynchronous delivery of education are emails, fax machines, social media like wikis and blogs, or discussion forums (Murphy, Rodriguez-Manzanares, & Barbour, 2011).

Synchronous training is done in real-time with an instructor charged with the responsibility of facilitating the training. In such a scenario, participants are expected to log on at a given time to be able to engage in a direct communication with the instructor as well as with fellow students (Ahmad & Bokhari, 2011). According to Al-Shalchi (2009), using the synchronous approach creates an environment that is more similar to face-to-face discussions. This is because the students and the instructors, although

geographically separated, meet at the same time; as a result, they are able to work in a more collaborative manner and are able to receive and give feedback instantly.

According to Hrastinski (2008), asynchronous techniques do support work relationships between students and teachers even when they cannot meet or discuss at the same time, asynchronous techniques provide a key component of e-learning which is flexibility; moreover, he noted that a lot of people take up distance education because of its inherently asynchronous nature which makes room for other commitments like relationships, jobs, and family responsibilities. He goes on to note, however, that while asynchronous does have some benefits, it has the tendency of isolating students from other students as well as from their instructors. According to Hrastinski (2008), the lack of a social construct in the asynchronous approach can impede the development of learning communities. In the synchronous environment, isolation can be overcome by ensuring constant communication between the participants. As a result, the students become more aware of themselves as members of a growing and learning community rather than as isolated individuals that are simply communicating with a technological medium.

According to Murphy et al. (2011), it has been concluded by Bernard, Abram, Lou, Borokhovski, Wade, & Wozney's (2004) in an attempt at uncovering whether an asynchronous or synchronous approach delivered better outcomes for the students, that the asynchronous approach to distance education had more positive outcomes than synchronous distance education. They also noted that synchronous distance education represented a poorer replication of the traditional classroom setting.

However, the authors also remarked that the dropout rates for asynchronous approaches to distance learning were also higher than that of synchronous counterparts. In addition, Andrews (2010) pointed out that synchronous environments have not always been proven to be inferior to asynchronous environments, saying that in some cases, students who reviewed and tackled case studies by means of synchronous discussions were found to have higher levels of critical reflection than those who participated in asynchronous ones. Moreover, some studies also showed that students preferred synchronous environments rather than asynchronous ones (Andrews, 2010).

Hratinski (2008) pointed out that synchronous e-learning supported more types of communication than asynchronous types; however, discussions have the tendency of being temporally limited because the participants are expected to accomplish all the planned initiatives within the time they agreed to meet. Ellingson and Notbohm (2012) studied the benefits and disadvantages of synchronous distance education by means of anecdotal evidence and found that receiving live instruction helped students become more engaged in the discussion in comparison to asynchronous and non-interactive approaches. Students were also able to see and hear one another and as a result, they were able to build stronger interpersonal relationships that promoted collaborative and peer-to-peer learning. As for the limitations of synchronously designed approaches, technical problems may occur which may impede the learning process of particular participants; moreover, attracting qualified faculty members to invest time and effort in facilitating the environment could prove to be challenge to many institutions.

The use of synchronous conferencing techniques offers the chance for interaction in a virtual classroom space—a live virtual classroom—allowing students to

communicate orally, exchange messages through text chat, webcam video, and more (McBrien, Jones, & Cheng, 2009). However, this documented increase in social interaction was by itself insufficient to demonstrate improved student learning efficacy from older distance-learning asynchronous platforms and indicated some weakness in the technology at that time (McBrien et al., 2009).

Recent improvements in high speed broadband Internet connections have provided the foundation for modern interactive software, which includes the ability to upload and view real-time PowerPoint presentations, virtual whiteboards and markup capabilities, separate student virtual breakout rooms, application share algorithms, student polls, emoticons, and improved text chat (Martin et al., 2012). The synchronous virtual classroom tools can provide help for authentic forms of interaction between students, peers, and instructors, specifically allowing instructors to address student understanding of instructional concepts immediately (Martin et al., 2012).

Dropout in Distance Learning

According to Buglear (2009), retention is very important in the maintenance of revenue for any institution. Moreover, outstanding online education is required to ensure that students who are unable to physically attend classes are still able to receive valuable instruction that meets their needs as well as their interests (Filimban, 2008). Boston et al. (2011) said that along with the increase of distance-learning opportunities, the concern over the retention of the students also becomes more pressing. Hermans, Haytko, and Mott-Stenerson (2009) says that distance education patronage increased by 72% between the years 1995 and 1998 and 81% of higher education providers provide at least one

online course. In addition, they emphasized that the burgeoning of technology globally necessitates a paradigm shift in the understanding of the classroom experience.

Ali, Ramay, and Shahzad (2011) said that the dynamic expansion of online teaching has been boosted by the rapid development of the Internet and the variety of web resources that are available; moreover, these trends and developments have had significant impacts on the quality of teaching and learning in such environments. Modernized means of communication continue to change the preference of students towards distance learning; furthermore, its availability, course offerings, and increased number of enrollees show its significance as a method of instruction (Ali et al., 2011).

However, distance-learning students showed a much higher dropout rate, and although figures vary per institution, administrators agreed that course completion rates are routinely between 10% and 20% higher for traditional venue course offerings than they are for distance-learning students (Fetzner, 2013; Filimban, 2008; Kotsiantis, Pierrakeas, & Pintelas, 2003). Hart (2012) noted that the estimation of students who took online courses grew to 30% in 2009 from only 10% in 2003; moreover, a nationwide survey showed that 33% of baccalaureate-awarding institutions viewed online course offerings as a critical component of the strategic plans. However, institutions continue to be troubled by retention problems and high dropout rates. According to Gascoigne and Parnell (2014), the retention rate for online courses appear to be consistently lower across disciplines and levels of study including secondary, post-secondary, and graduate studies.

Wilson and Allen (2011) pointed out that previous research efforts showed that online students have higher withdrawal and failure rates compared to students who took traditional face-to-face courses and they have more trouble accomplishing requirements

on time if they ever accomplish them at all. Wingreen and Moorman (2011) said that course non-completion is the first and most visible manifestation of students' learning outcomes and is directly correlated with other learning outcomes. It is a fact that there is a greater tendency for students dropping out from open or distance-learning institutions compared to conventional learning institutions or universities. While dropout rates vary from institution to institution, the retention of students is one of the major goals of any institution offering distance education (Xenos, Pierrakeas, & Pintelas, 2002). Mohammad and El Masri (2012) noted that several studies point to numerous reasons for student dropouts; such reasons include student barriers, faculty barriers, organizational barriers, and course considerations that influence their motivations.

Some dropout issues were found by Mohammad and El Masri (2012) to be situational which rise from the students' personal life circumstances like changing employment or family setups. Other issues were dispositional and root from the personal problems of the student that, in turn, influence their persistence and motivation to complete their courses. Yet other problems include institutional issues that occur when students have difficulties with the institution itself, such as lack of support service availability. Lastly, epistemological issues occur whenever students are apprehensive of the course or program they are in (Mohammad & El Masri, 2012).

Mohammad and El Masri (2012) found that of these probable causes, situational and dispositional barriers to course completion were the most common causes of attrition in distance education. Nichols (2011), in his attempt to identify the interventions that help improve retention in distance education, found that while it is difficult to accurately identify the reasons why students choose to dropout and to research retention behaviors,

it can be confidently said that personal reasons have the greater tendency of influencing students' decisions to non-complete a course.

Hermans et al. (2009) remarked that the causes of why students eventually lose interest or motivation in distance learning needs to be identified; however, doing so would entail answering several questions in relation to a variety of factors. For instance, one would have to look into the satisfaction of the students by identifying whether the additional constructs specific to distance education, like the Internet or other forms of technology, serve as helpers or impediments in the students' learning experiences. The flexibility of the curricula, the commitment of the students, their acceptance of new technologies, and their eventual satisfaction need to be observed in relation to their outcomes (Hermans et al., 2009).

Boston et al. (2011) pointed out that while student retention, particularly in higher education, has received great attention in the existing literature since the 1800s; researchers who have attempted to identify the factors that directly influence students' decisions to leave institutions have found it rather difficult to obtain accurate and reliable results. Among several things, Boston et al., (2011) identified certain factors like social integration, admissions selectivity, and student GPA as the factors more prevalent in literature as those that influence student retention or attrition. Another factor that cannot be discounted is the ultimate effect of lack of competition in a regional market. In a location where a provider is a single source (or one of just a few) often retention and satisfaction will not show a correlation (Szathmary, 2014).

In order for student retention rates to improve, institutions must analyze their existing retention characteristics and strategies; from there, the leaks that exist within the

structure imposed by the status quo must be appropriately identified (Nichols, 2011). In order to do so, a reflective analysis of how to support the needs of the students who drop out due to these leaks must be identified as a means of reducing the drop-out rate of the learners and along with it, support services provided for students must facilitate good learning experiences for them (Gil-Jaurena, 2014). Early studies concerning student success have correlated student efficacy and performance with timely and accurate feedback (Lindsley, Brass, & Thomas, 1995). According to Street (2010), previous studies conducted concerning dropouts within online courses have found often-inconsistent factors that influence attrition among students. Some factors are internal such as self-efficacy, determination, time-management, and autonomy. However, there are also external factors like family, availability of organizational support, and technical support that affect the retention of the students within the institution. Methodological flaws including low statistical power and absence of a control group when considering both synchronous and asynchronous distance-learning venues—which were corrected in the present study—limited the above studies.

Distance learning has certain constructs that are unique to it; as a result, it faces challenges that are more difficult to resolve than those for traditional learning environments. The issue of attrition is particularly more pressing for distance-learning environments than for traditional instruction. The existing research efforts towards higher education student retention have been abundant whereas the studies pertinent to dropouts in distance learning have not been explored as thoroughly. However, most studies that explored the area detailed concepts like motivation, persistence, and student satisfaction along with curriculum flexibility and social constructivism as primary

influencers for a student's decision to stay or leave a distance-learning institution. The following sections discuss these concepts in greater detail and how they influence the distance-learning process.

Relationship of Attrition to Student Satisfaction and Motivation

Despite its increased popularity, one of the main problems that distance learning faces is attrition that may be caused by both internal and external factors. Creating a demarcation between the potential sources of attrition, however, continues to be problematic (Hart, 2012). Student motivation has been identified in previous studies as an important cause of dropouts when students choose to study at a distance (Dadigamuwa & Senanayake, 2012; Yuen, Lee, & Tang, 2011). Hart (2012) also pointed out that one of the most common reasons for high dropout rates are the lack of persistence among online students.

Wingreen and Moorman (2011) did an assessment of the reasons for students' non-completion of online learning programs. They observed that most of the literature on the success of online learning programs often leads to ambiguous and sometimes conflicting results because previous research efforts almost exclusively focus on the individual-level effects of the learning programs. Wingreen & Moorman (2011) remarked that observing instructional models at a program level is critical because individual-level outcome analysis might not provide much insight regarding the host program itself and its learning environment as a whole. They point to course non-completion as one of several student outcomes that are possible for online learning and noted that non-completion could prove to be a loss for the learner as well as the institution providing the learning opportunity. This assessment focused on asynchronous

online learning programs and did not acknowledge the increased tools available for synchronous technologies available in distance learning.

During a 10-year study, Fetzner (2013) studied online community college students and found the reasons for unsuccessful online completion remained stable during the study period. The reasons included getting behind and being unable to catch up (19.7%), personal problems (14.2%), work, family, and school schedule saturation (13.7%), did not like the online format (7.3%), did not like the instructor's teaching style (7.3%), technical difficulties (6.8%), the course was taking too much time (6.2%), lack of motivation (5.0%), and the course was too difficult (3.0%) (Fetzner, 2013).

Motivation is the process through which the activities of a person are instigated and sustained and are heavily influenced by the person's end-goal (Hartnett, St. George, & Dron, 2011). Street (2010) defined persistence as the continuation of a student's studies despite the obstacles that exist for him/her; moreover, it is often considered as a measure of how effective the programs of higher education institutions are. However, the persistence for distance learning and the persistence for traditional learning are often different because they target different demographics. Distance learning approaches often attract older students who are more prone to work and family-related conflicts. As a result, their persistence may vary to a lower degree than students in traditional learning schools. Both external and internal factors have effects on students' persistence; however, there is a lack in the existing empirical studies focusing on the reasons behind student attrition in online learning (Street, 2010).

In an attempt to understand the factors that influence the motivation of students at a more empirical capacity, Street (2010) performed a review of the literature surrounding

the factors that influence a person's decision to persist or abandon an online course program and identified the common factor that exists among the different pieces of work. She summarized the findings saying that while there is no single set of variables that directly impact the decisions of the students, there were common themes that emerged across the research such as course factors and support availability. The most prevalent theme that affected the motivation of the students, however, proved to be self-efficacy, which is defined as a person's capability of executing behaviors or achieving certain goals (Street, 2010). The factors that influence dropouts as pointed out by Street (2010), particularly self-efficacy, can be observed in alignment to Bandura's model of reciprocal causation which says that a person's behavior has an effect on the personal characteristics as well as his/her environment. Similarly, the characteristics or the person as well as his/her environment also have an effect on the person's behavior.

Hart (2012) performed a systematic review of the literature regarding the factors that are associated with the persistence of students in online study programs and found that while students generally report satisfaction when it comes to online environments, and while the outcomes of students in online-based environments are similar to those of the traditional classroom in most cases, there are challenges that are specific to the online environment that have an effect on the students' abilities to complete the programs. The feedback construct of the distance-learning approach has a relevant impact on the student's ability to complete the course.

Hart (2012) said that as long as there is a positive linkage between the learning environment, the student's motivation, the feedback of the instructors, and the perceptions of the curriculum, students were likely to experience positive outcomes.

Isolation can also lead to decreased engagement among distance learners. There have been two types of isolation cited in literature: isolation from instructors and isolation from fellow students. Other factors that contributed to the lack of persistence or motivation of students is the potential difficulty of accessing resources like electronic libraries, a lack of computer accessibility, or the poor communication construct of the distance-learning medium (Hart, 2012).

Hartnett et al. (2011) examined students' motivations in online distance-learning environments. They also pointed to the advancement of technologies as the primary moving force of distance education saying that the growth of the Internet and other technologies have effected a paradigm shift towards a merging of online teaching and learning into the regular routine of most educational institutions. The concept of distance learning is now embedded into the construct of most educational institutions; however, there are several factors that are crucial to its success. One such factor is motivation, which is as important in the traditional face-to-face approach as it is for the online-learning approach. Hartnett et al. (2011) remarked that poor motivation has been frequently identified in literature as a decisive factor that contributes to the high dropout rates of online courses.

Hartnett et al. (2011) used the self-determination theory as the framework for understanding motivation in online distance learning. The theory posits that all humans have the intrinsic need for volition or autonomy, the need to feel competent, and a need to feel connected in relation to their environment. The self-determination theory posits that if a person is encouraged by the environmental conditions, then the individual will feel more autonomous which promotes the formation of intrinsic motivations. They further

suggest that if a person feels intrinsically motivated, then outside incentives would no longer be necessary for the student.

Incorporating this concept into the online-learning context, Hartnett et al. (2011) found that online learners have the tendency of not becoming intrinsically motivated; however, most of the students reported moderate to high levels of extrinsic motivations. The authors finally suggested that when designing learning programs, instructors must create learning activities with clearly identified relevance to the learning objectives of the learners in a way that ensures them of its significance to the attainment of their personal goals and aspirations as well as their short- and long-term interests.

The challenge in motivating students at a distance is complicated by the easier detection and correction of motivational problems in traditional face-to-face classroom and learning situations compared with distance-learning settings (Fetzner, 2013). Baxter (2012) revealed that, while some online students admitted that their primary reason for enrolling in a distance-learning program is the lack of physical presence required, they found that they had expanded a lot in their motivation to develop an identity (that is, of "being a student") by meeting with others—either online or face-to-face (Baxter, 2012). As such, the expectations of future distance-learning students may change, given that it has become easier to initiate and cultivate online friendships and mentorships today (Baxter, 2012). Essentially, then, Baxter (2012) showed how student identity influences the dropout rate by affecting student resilience, and, in turn, how interactions with others inform student identity.

According to Burgess (2006), student satisfaction has been established by the Sloan Consortium as one of the five pillars of quality online education along with

learning effectiveness, cost effectiveness, faculty satisfaction, and access. According to him, distance learning was originally designed to be an autonomous activity which students should be able to complete on their own as an exercise of their independence; however, initial models for distance learning had the tendency to be instructor-centric and failed to create programs which address the individual needs of the students. Burgess (2006) pointed out that the more structured a course is, the greater the transactional distance between the student and the instructor because the flexibility of the program is limited. He further noted that the lesser the transactional distance between the student and the instructor, the greater the satisfaction of the students because their needs become more accommodated.

Levy (2004) investigated the possible effect of student satisfaction on their eventual outcomes in the program. The author remarked that several studies indicate a strong relationship between student satisfaction and student success, citing that 42% of students who dropped out from their courses expressed that dissatisfaction over the constructs of the learning environment was the main reason for their decision to not complete their respective programs. The author goes on to say that the success of e-learning programs, much like any other instructional approaches, can be measured only by putting an emphasis on the measurement and analysis of their students' satisfaction with the program. Park and Choi (2009) noted, however, that uncontrollable factors may sometimes be the cause of distance-learning failure more so than student dissatisfaction or lack of persistence; thus, high dropout rates might not always be indicative of non-successful program implementations. Park and Choi (2009) agree that creating and understanding student attrition models must address the issue of high dropout rates.

Along with the advancements in technologies, the demand for education that is flexible and is able to support the career development and lifelong learning needs of its learners has also increased; in addition, the expectations of the people for quality and effective instruction also shows a positive correlation to these perceived advancements. The satisfaction of the students with the program can be represented by how effective the instruction has been for the student as well as how positive the overall learning experience of the student was or has been (Ali et al., 2011).

The study by Ali et al. (2011) explored the factors which influence the satisfaction of students with distance learning in Pakistan with the primary objective of observing the relationship of student satisfaction with other variables like the performance of the instructor, the interactions that exist within the learning construct, and the student's evaluation of the course itself. They performed this study to tap into the reasons of why students, employers, and even corporate executives in Pakistan often perceive distance learning as having poor quality. They found that student-instructor interaction played the biggest part in predicting the satisfaction of the student with the program. Following this is the instructor's performance which involves not only the ability to instruct the students effectively but also their ability of motivating their students, giving them the respect they need, encouraging their questions and comments, as well as ensuring availability outside of class hours.

Rabe-Hemp, Woollen, and Humiston (2009) performed a comparative analysis of the engagement of students, their learning, and their satisfaction in two different modalities: lecture hall and online learning settings. They had 278 undergraduate students (27 online and 256 traditional) participating in their study. They performed a

pre- and post-survey with the participants tackling the students' demographic information as well as their comfort levels with technologies. Their findings showed that once a person achieves higher levels of competence, there is a greater tendency for that person to be satisfied with the course or the program. The satisfaction during group-oriented activities also showed improvement when there are better interpersonal relationships amongst the participants. The lower statistical power of this study will be corrected in the present study and more evenly representative of traditional versus online venues.

Rist (2008) also found a substantial relationship between student satisfaction and improved performance with distance-learning environments from student interaction with peers and instructors. Battalio (2007) compared the results of two similar online classes that directed different levels of student-student interaction, and found student satisfaction remained relatively unchanged in the different courses. Furthermore, two thirds of the students preferred the courses with less student-student interaction, thus concluding student-student interaction failed to be a determinant in student perception of course success (Battalio, 2007). However, other studies have shown student performance and student satisfaction are both affected by student-instructor and student-student interaction in the online environment (Ferguson & Tryjankowski, 2009).

Kuo, Walker, Belland, and Schroder (2013) revealed that all interactions were significantly correlated with student satisfaction. The authors found that student-teacher and student-content interaction significantly contributed to student satisfaction, while student-student interaction was seen to be a poor predictor of student satisfaction (Kuo et al., 2013). It must be said, however, that the fully online courses collected in their study were only eight weeks long and offered during the summer (Kuo et al., 2013). As such,

the courses may not have been designed to involve numerous group activities, which would have given the students more opportunities to interact with their classmates, which may increase their perceived need for more or less student-student interaction (Kuo et al., 2013). The authors also acknowledged that the design of the courses they studied were not assessed, thus making it possible that the nature of the course designs led to their finding that student-student interaction was not a significant predictor of student satisfaction (Kuo et al., 2013).

Despite the contradictory results present in various research efforts looking into the relationship of satisfaction and motivation to the decision of students to stay or leave distance learning, recent investigations of student attitudes on distance-learning issues suggested that a mix of formats may be the preferred choice (Holmberg-Wright & Wright, 2012). These studies show that student motivation remains an important aspect of dropout rate in the distance-learning environment.

Relationship of Motivation to Presence, Engagement, and Interaction

Student attitudes about asynchronous distance-learning classes compared with traditional face-to-face classes have revealed that they would rather opt for the traditional face-to-face classroom courses, if given the chance (Holmberg-Wright & Wright, 2012). The study showed that students preferred the spontaneity and immediacy of asking instructor questions rather than waiting for e-mail or discussion forum responses (Holmberg-Wright & Wright, 2012). The sense of community and lively campus classroom debate through technology-mediated communication does not have the same effect as in-person communication does (Holmberg-Wright & Wright, 2012).

Student perception of transactional presence (the perception of availability of, and the perceived connection between, both parties) has been identified as an important predictor of student success in distance learning (Shin, 2003). Student perception of instructor presence as well as student-instructor interaction was significantly higher in synchronous distance learning compared to asynchronous distance-learning courses (Baker, 2010). Instructor immediacy in the distance-learning environment has been shown to have positive correlation with student outcomes, and decreases the psychological distance between student and teacher (Baker, 2010). Baker also found that psychological distance is decreased with instructor presence, while student motivation is increased with instructor presence (Baker, 2010).

Baker (2010) said that the question is no longer whether or not the online approach to learning is as effective as traditional learning approaches or not; rather, the question now delves into identifying the strategies which most effectively facilitate online education. The author aimed to explore the influence of instructor immediacy and presence on the learning, cognition, and motivation of the students. McKerlich et al., (2011) studied student perceptions of teaching, cognitive, and social presence in virtual settings. They defined presence as having a sense of participation. The concept of presence in distance education has received wide attention in literature; particularly, the concept of "being there" without having to physically be there. They attributed this growing interest to the non-compliance of distance education to the traditional definitions of presence, which are typically characterized by geographical constraints.

Presence can be broken down into social presence, cognitive presence, and teaching presence (Lewis, 2011). Social presence is the extent to which students

outwardly project their inner selves and how they are perceived by their peers or their instructor. Cognitive presence is the extent to which a learner is able to construct knowledge or confirm assertions through discussion within a critical community. Teaching presence is defined as the direct or indirect role or influence of the teacher in the design, facilitation, and implementation of the course as a means of providing students with a meaningful educational experience (McKerlich et al., 2011).

In particular, the live virtual classroom allows the required social presence, wherein students are able to work together with their fellow students, instructors, as well as subject matter experts (Lewis, 2011). Interaction in a course with fellow students has been shown to be often as important as the instructor-to-student aspect (Sullivan & Freishtat, 2013). For some students, the diversity of thought provided new perspective (Sullivan & Freishtat, 2013). It also provided the opportunity to gain greater understanding of peer students' experiences and environments and enabled a better understanding of fellow students (Sullivan & Freishtat, 2013). The diversity of experience is the most enriching feature, according to comments in the study of Sullivan and Freishtat (2013). Among the three types of presence in the model: cognitive, social, and teaching—teaching presence is the least explored one. However, teaching presence is conceptualized to be just as important as social and cognitive presence (Baker, 2010).

According to McKerlich et al. (2011), presence in distance education has varied across the three generations of distance learning. Presence used to be essentially non-existent during the first generation of distance education because the emphasis was placed mostly on the transmission of content from the instructor towards the students and vice versa in a clear fashion; thus, the focus during the first generation of distance

education was on independent learning. The following generation emerged as a synthesis of asynchronous and synchronous approaches to education. Finally, the current generation is focused more on e-learning or through a learning management system facilitated by web-conferencing and other forms of synchronous interactions.

Naylor and Wilson (2009) remarked that one of the most common concerns when it comes to online education is the problem that arises from the physical separation of the students and the teachers. They observed the benefits of enhancing the transactional presence as a means of bridging the gap. Transactional presence is not simply an issue of geographical separation but also the separation created in the patterns of behaviors of the teachers and the students. They posit that the separation has a profound effect on both the learning capabilities of the students and the learning capabilities of the students. The degree of transactional distance between students and instructors can be influenced by three interrelated factors: the dialogue between the teachers and the students, the structure of the instructional program, and the level of autonomy of the learner. The theory of transactional distance serves as a framework for understanding the importance of interactions in enhancing the motivation of the students to persist in the programs and will be discussed in a following section.

Garrett (2011) explored the concept of student engagement by positing that student engagement is more than just class activity, which is only one level of engagement; rather, student engagement implies something more. Going beyond simple class activity may include students proactively seeking other students outside classroom to discuss or debate issues that transcend their immediate experience in the course (Garrett, 2011). If engagement is a complex form of interaction, the challenge is for the

instructor to recognize student engagement as the opposite of student disengagement—behavior that demonstrates a student is not interested or committed to learning. Frequent absences, sleeping in class, undisciplined chatting, and consistently being quiet during class discussions are indications of student disengagement (Garrett, 2011). On the other hand, student engagement can be measured or observed as speaking up in class discussions, participation in class activities, asking thoughtful and well-considered questions, responding to what their classmates have said, researching independently, and taking questions and problems they have come across outside class while including them in class discussions, to name a few (Garrett, 2011).

Angelino and Natvig (2009) say that enhancing the engagement of online learners is a possible approach towards the reduction of attrition rates. They introduce a model for engagement through which they suggest strategies for engaging online learners that they divide into four strategic areas: recruitment, coursework, post-coursework, and alumni. They suggest that during the recruitment process, engagement can be enhanced by increased communication with potential students, or marketing strategies like sending letter or brochures that inform potential students about the program as a means of increasing awareness about the distance-learning programs. Engagement during coursework is contingent upon the instructor's constant announcements and efforts at communicating like emails and/or posts for weekly discussions. Instructors must provide detailed and clear instructions for any coursework provided. In addition, for students' engagements to persist, the instructor must provide timely feedback with constructive and in-depth comments on how students can improve their skills. For the post-coursework phase, students must be given the opportunity to evaluate their instructors and how they

could further enhance their engagement. This provides students with the opportunity of highlighting the portions of the program that they liked as well as those that they would want to change. Finally, continuing student engagement beyond the stay in the program could help increase the reach of the program by referrals or recommendations (Angelina et al., 2009).

Chen, Gonyea, and Kuh (2008) said that one of the most important issues facilitators of distance-learning approaches have to resolve is the possible lower levels of engagement on the part of the students relative to the level of engagement of campus-based learners. This is important because engagement is heavily related to other concepts that boost the effectiveness of distance-learning approaches like high grades, student satisfaction, and their persistence. Because of this, student-faculty interaction, peer-to-peer collaboration, and active learning are deemed necessary for the online learning environment. Student engagement can take many forms: active and collaborative learning, intellectual challenge, perception that the learning environment supportive of one's goals and aspirations, and meaningful interactions with faculty. By having improved levels of engagement, students were able to develop mental and physical habits that enhance their abilities for continuous learning (Chen et al., 2008).

Chen et al. (2008) performed a study on 189,324 randomly selected freshmen and senior students, 3,894 of which were in distance-learning programs, to identify the differences in the engagement of distance learners from that of their campus-based counterparts. They found that distance learners were often more engaged than their counterparts taking traditional courses; however, they note that engagement in active and collaborative activities were not better for distance-learning students than traditional

learning students. Having said that, the study by Chen et al. (2008) suggests that given the correct learning strategies, distance learning has the potential of engaging the students just as much or even more than in traditional learning environments.

Interaction between the instructor and students is the centerpiece of the learning experience and has been widely measured as the primary factor that influences successful learning in both the traditional and distance-learning environments (Baker, 2010). Interaction is further credited as a vehicle for influencing student motivation, student participation, learning outcome achievement, and active learning (Quigley, 2014). Martin and Downey (2009) showed that an instructor connection with the student—connective instruction—is an important part of student motivation and therefore an important part of student achievement and performance. Radovan (2011) studied student motivation factors using the concept of self-regulated learning with respect to success in distance learning, measuring intrinsic goal orientation, task value, help seeking, elaboration, self-efficacy, effort regulation, learning strategies, effort regulation, and time organization. The motivational factors of self-efficacy, intrinsic goal orientation, and effort regulation proved most important in predicting course grade (Radovan, 2011).

Enhancing the interactions between the students and the instructors are highlighted by the fact that students learn differently (Mabrouk, 2011). According to Mabrouk (2011), the fact that students learn differently means that certain techniques, tools, approaches, and models for instruction might be effective for students but be ineffective for other students. While face-to-face course meetings allow instructors to obtain immediate feedback about the effectiveness of their chosen approaches, the asynchronous nature of common distance-learning environments makes it more difficult.

The lack of face-to-face interactions leads to students with low levels of self-motivation, diligence, and responsibility who lack the pressing need or desire to complete the course requirements as necessitated by the curriculum. The establishment of the necessary emotional connection between the students and the instructor is dependent upon the instructor's ability to create a nurturing environment that diminishes any feelings of isolation. Moreover, the instructor must ensure that the students are bounded by the rules of engagement for communication within the construct, for the online discussions, and for their participation in the course (Mabrouk, 2011).

Dabaj (2011) said that there are some differences between the types of communication in distance-learning environments and classroom-based environments in that technical barriers during communicating may be experienced by students due to lack of technology acceptance or inexperience with communication tools. The author noted that for effective distance education to be achieved, these communication barriers must be diminished. In a study of students taking synchronous online courses at Stanford University and Nanyang Technological University in Singapore, Mackey and Freyberg (2010) found that in-class interaction between students and the instructor raised the levels of satisfaction on the part of students, although it is less important for students who have become used to less in-class participation.

Mackey and Freyberg (2010) noted that interaction beyond the classroom may comprise a large portion of total interaction between students and the instructor in the traditional classroom format, and therefore, whenever possible, out-of-class interaction should be promoted in distance courses to increase instructor immediacy. Consistent with previous studies about distant learning, student cognitive learning does not appear to

increase or decrease with social presence; however, student satisfaction and affective learning is affected by social presence (Mackey & Freyberg, 2010). This suggests a decoupling of affective and cognitive learning, which suggests the level of intricacy and elasticity in the learning process (Mackey & Freyberg, 2010).

Another study that emphasized the importance of interaction in improving student retention is that by Martin et al. (2012). They said that interaction is crucial to the satisfaction of students in online courses. They further noted that adding synchronous components to the online learning environment could help facilitate good interaction. According to Martin et al. (2012), interaction is an event that occurs between a learner and the learner's environment that has the primary purpose of steering the learner towards achieving behavior that supports the learner's educational goals. Interaction in online courses was found to be the most important requirement for successfully completing online education and that the frequency and the quality of the interactions between students and their instructors also determine how effective the instruction will be for the student. Instructional and social forms of interaction must be synergized to ensure the successful fostering of interaction in online courses.

Lewis (2011) maintained an important distinction between a truly live classroom experience versus a virtual live classroom: virtual classrooms can be seen as the lesser relative to the "real" thing—the physical classroom—with regards to student engagement and overall experience. To maintain student motivation, and emphasize the advantages of the virtual aspect of the live virtual classroom, course designers and instructors must focus on a unique design based upon applied best practices (small classes, short modules

to prevent participant disengagement after 90 minutes at a time, and extensive use of multimedia) (Lewis, 2011).

Oztok, Zingaro, Brett, and Hewitt (2012) did a study on the effect of interaction and communication on asynchronous discussions. The underlying concept of the study is social constructivism, which posits that learning is shaped by the context, the conversations, and the collaborations that occur. The authors said that learning is essentially a social activity because it occurs through communication, collaboration, and interaction. Social constructivism highlights the role of interactions in the process of constructing knowledge. Integrating social constructivism in distance learning would enforce the importance of discussions because they connect the individuals and motivate them to take part in the construction of knowledge.

A recent study comparing student-teacher interaction in virtual synchronous classrooms versus traditional face-to-face classrooms showed significantly higher online interactions in generating a course project than the traditional face-to-face (Akhras, 2012). Akhras (2012) pointed out the importance of analyzing the teaching and learning outcomes of online collaborative work in introducing a significant change in approaches to education. She says that as technology advances and opens new opportunities for learning and teaching, collaboration becomes even more possible; thus, there is a need for understanding its social, dynamic, and multidimensional nature and how it affects the paradigm of education.

Akhras (2012) further noted that online collaborative tools further enable people to create knowledge in a cooperative manner. She emphasized that modern teaching and learning approaches emphasize activities and tasks that are of collaborative, complex,

contextual, and conversational natures. Knowledge is built through a process of peer interaction and a convergence of the various knowledge bases of the participants. The interactions that occur between the teachers and the students create a synergistic social process that has its foundation on shared awareness and understanding. She found that online students discussed a much broader array of subjects (some technical, some general, some project-specific), whereas the face-to-face student teacher relationship was more that of a coach-player interaction, with a relatively low percentage discussing general topics (Akhras, 2012).

Abdous and Yen (2010) compared self-perception of the student-to-teacher interaction and learning outcomes and satisfaction across the many possible modes of delivery (face-to-face, satellite broadcasting, or live video-streaming) to determine if delivery mode could predict the level of student perceptions of student-teacher interaction. Delivery mode was not a useful predictor for self-perceived student-teacher interaction (Abdous & Yen, 2010). One possible reason for this is that the three delivery modes mentioned afforded the same level of social presence from the teacher and immediacy, as evidenced in verbal and nonverbal gestures and cues. Effective management of the three different audiences appears to have presented students with the same level of self-perceived interaction (Abdous & Yen, 2010). However, in the same study, an increase in self-perceived student-teacher interaction tended to come with an increase in student satisfaction (Abdous & Yen, 2010). This supports earlier studies that emphasized the importance of teacher-student interaction in students' satisfaction (Abdous & Yen, 2010).

Putting these recent studies together suggests a relationship between dropout rate, motivation, presence, and student interaction. Student dropout rate is affected by motivation, and, in turn, student motivation is affected by presence, which allows for more interaction between students and their teachers, as well as their fellow students. One other factor that can directly influence motivation, satisfaction, engagement, presence, interaction, and other aforementioned concepts is the instructor (Born, Phillips, & Trainor 2012). The environment that nurtures these factors is dependent upon the nature of the instructor who will be facilitating it. The following section discusses the role of the instructor's motivation on the improvement of the learning environment.

The Role and Motivation of Instructors in the Distance-Learning Environment

Student motivations and student outcomes are also tightly coupled to instructor motivations and instructor practices. Equally important to the distance-learning environment and directly controlled by the instructor is the concept of structure: the foundation of the virtual live classroom, and how this electronic communication technology allows for interactions (McBrien et al., 2009). The quantity of student and instructor dialogue (both audio and written) is decreased with real-time conversation when using a synchronous learning platform, provided the instructor is amenable to this increased alternative live interaction-- (McBrien et al., 2009).

Filimban (2008) supported the importance of the instructor by stating that while personal factors like motivation, time management skills, and discipline do play vital roles in the facilitation of student success in distance learning, certain instructor characteristics were also of utmost importance in ensuring the attainment of the students' educational goals. Such characteristics included the provision of clear and constructive

feedback and criticism to the students with regards to coursework and discussion forums. Ali et al. (2011) also emphasized the role that instructor performance plays in the satisfaction of the student with the course. They said that instructors required new sets of skills as technology continues to modernize education. Instructors are no longer simply the source of students' knowledge but they also have to play the role of the students' knowledge resource managers. Moreover, the widespread belief in the importance of teacher-student interactions has been accompanied by assumptions that for learning to occur, there needs to be some form of communication between the student and the instructor (Ali et al., 2012).

The instructor is an important aspect of any distance-learning environment because he/she has the definite role of making the environment successful by ensuring that the required level of interactions and discussions with the students are met and that he/she functions effectively as a mediator between the student and the materials of the course. The instructor, therefore, has the critical role of understanding the needs of the learners (Ali et al., 2011; Scharf 1966). However, Allen et al. (2012) said that faculty members have a greater tendency of being pessimistic than optimistic when it comes to online learning; they are often skeptical about the possible outcomes of distance education. Nearly two-thirds of the faculty members that were surveyed reported perceiving online courses as inferior to traditional learning approaches (Allen et al., 2012).

Instructor motivation concerning distance learning varies substantially (McBrien et al., 2009). Instructors need to be aware of the influential role they play in student motivations, and the value of the task (for example, online discussions) needs to be

clearly identified and linked to learning objectives to aid student choices and interests in learning (Hartnett et al., 2011). Instructor practices define the structure and directly affect the technological aspects of the live virtual classroom (Martin et al., 2012). Instructor teaching style and visual presence are critical for student engagement with class content (Martin et al., 2012). According to Filimban (2008), educators must use the concept of engagement as a way of facilitating the development of the students' knowledge, skills, and attitudes in order for them to achieve the goals of the lessons they are being taught.

Furthermore, prudent and innovative use of the new technologies available for synchronous studies such as content frames, PowerPoint presentations, breakout rooms, application sharing, whiteboard applications, text chat, emoticons, and student polls, create an atmosphere of student involvement and retain interest, as in a live classroom (Martin et al., 2012). All of these tools amount to a mechanism or classroom structure that the instructor can use to provide immediate feedback, foster an exchange of multiple perspectives, provide an environment where exchanges of emotional support are possible, strengthening overall social presence (Martin et al., 2012). Hays (2008) observed a number of instructor attitudes concerning distance learning at the University of Memphis. Online or distance learning is simply not posting lectures online—the instructor's time becomes spent much more on individual students than in traditional classroom lecture format (Hays, 2008).

There is an observed second-class stigma assigned to those who teach online courses (including issues of tenure), incommensurate with the substantial preparation effort required—often beyond that of a normal lecture, given that it includes possessing

more sophisticated technical expertise (Hays, 2008). While instructors do feel more academic freedom, there is a need identified for some level of standardization to preclude student dissatisfaction with course-to-course variances of interface and quality assurance (Rist, 2008). Coinciding with the problem of stigma, Holmberg-Wright and Wright (2012) identified constant requirements for hardware upgrades, technical support, instructor education of hardware use, and student requirements as substantial monetary expenses required for online education and the integration of technology into college courses.

Green, Alejandro, and Brown (2009) explored the retention of experienced faculty in distance education programs by examining the factors that influence their level of involvement. According to Green et al. (2009), a significant body of literature exists which aims to codify the factors that motivate, encourage, or discourage a faculty member's involvement in institutions' online courses. Some of the items they found from the literature included opportunities for experimenting with pedagogies, skills with computing, opportunities for learning new technologies, marketability of skills, career development, or simply the opportunity to share personal skills and capabilities.

Some faculty members are sometimes motivated by extrinsic motivations like institutionally rewarded incentives. The characteristics of the campus culture also have the capacity of influencing the instructor's motivations. Some of the characteristics that encourage the persistence of experienced faculty members to enter distance-learning opportunities include high levels of administrative commitment and support, a sense of ownership on the part of the faculty, frequent interaction among the community of faculty members, and a rigorous evaluation of the faculty as a step towards providing them with

career advancements (Green et al., 2009). Some discouraging factors experienced by faculty members on the other hand, as listed by Green et al. (2009), include the lack of financial compensation in relation to the work that is being expected from the faculty member, the time and effort that is required by online education relative to that required by traditional learning methods, lack of experience with online teaching and the lack of recognition that are given to teachers who focus on online teaching efforts, and the lack of sufficient training when it comes to technologies required by distance education.

As compared with items for success, communication between instructors and students in a live virtual classroom can be hindered (the "communication gap"), and the student can be discouraged or put off by some negative teaching techniques and frustrations. The top of the list is technical frustration and stress (Mashaw, 2012). Boring or static presentations and lectures can turn a participating student into a non-attentive daydreamer (Mashaw, 2012). Dissatisfaction due to inflexibility, unreasonable assignments, or perceived impossible tasks, and a lack of guidance or learning assistance round out practices instructors should fully understand in the live virtual classroom environment. They must be addressed by the instructor prior to class, to minimize the discordant effect that may occur given the geographical distance between student locations (Mashaw, 2012).

Tu, Blocher, and Gallagher (2010) concluded that effective instruction strategies have a greater impact on student learning environments than effective technology tools. Sullivan and Freistat (2013) asserted that the instructional design framework strategy is crucial for student engagement, and noted that instructors often have limited knowledge related to the best pedagogical practices for the integration of technology, to students in

distance learning. Sullivan and Freistat (2013) determined a relationship between learning strategies and course achievement and satisfaction, resulting in a recommendation for instructors to develop methods to increase active student discussion and participation in their distance-learning courses.

Valleries (2008) studied instructors placed in the role of students (in this case, for faculty development courses) and discovered that learners self-regulate interactions in web-based professional development activities as a learning strategy to achieve specific goals because of specific needs. Valleries' (2008) recommendations for success included individualizing learning through goal setting, providing support through goal setting, and supporting learner autonomy to self-regulate interaction to meet specific goals. Additionally, his discoveries indicated a need for professional instructor development to shift focus from traditional instructor-centered activities to activities where participants set goals to achieve, based upon individual needs (Valleries, 2008).

Filimban (2008) explored the potential elements of an effective online course as extracted from the perspectives of instructors and students, and the observations of researchers. The author noted that high attrition or lack of student motivation could be attributed to several factors including inexperienced instructors, noting that some instructors are not properly trained for the execution of distance-learning courses. In order for an organization to have a solid pool of instructors, they must take into consideration the special need for training the supporting the faculty members as they attempt to provide their students of good educational experiences. Maguire (2009) pointed out that the creation of distance-learning policies within organizations often occur after the courses have been offered to the public; in addition, faculty members are

often left out in the design and planning of such online course offerings but are expected to willingly teach them.

Maguire (2009) performed a qualitative case study with a systems perspective using a purposeful sample of faculty members coming from varying years of experience and various academic disciplines. Maguire's (2009) findings showed that faculty members have the capability of greatly impacting distance education by sharing their experiences and first-hand knowledge about the program as well as by having greater involvement in the development of distance education policy development. By providing them leadership roles or allowing them to participate in policy development committees, faculty members are also given the opportunity for representing the interests of the students and ultimately bettering the program. An important finding is also the increased sense of enthusiasm with online teaching that faculty members could acquire from a great sense of faculty involvement.

Finally, Maguire (2009) made recommendations rising from the findings of the study. Faculty must be given a voice in the organization—they must be given the opportunity to participate in the planning process of the institution before they are asked to teach the courses that will be offered. They must also be provided the appropriate support to foster their excitement and expected level of participation. Such support services include the development of policies that aid the faculty member in the educational process. For instance, policies must be lobbied ensuring that the class size of the faculty member will be manageable. Faculty members should also be given the necessary technology to remain up to date in modern educational trends. Faculty members must also ensure the representation of the students in the development of

distance-learning policies. Students' feedbacks can be obtained with the faculty members as the primary channel of communication between the students and the administrators; thus, by giving voice to the faculty, the students could also be given a voice.

Overall, instructors must consider that the following concepts are vital in developing learning effectiveness, and are directly under the controls of an instructor: Interface design and usability; content, presentation, organization, and the appeal of the material; interactive and dynamic sessions with novelty; usability and flexibility of the learning modules (Mashaw, 2012). Student interaction and participation thus becomes more than just discussion or writing—engaging activities, with the technology allowing the instructor to give the student direct, timely input or demonstration of a particular concept (Cross, 2012). Live discussion, ease of communication with the instructor or their group of peers, and encouragement of participation are important factors in evaluating and encouraging interaction in distance learning (Mashaw, 2012).

Finally, the instructor's inspirational and motivational abilities are imperative for an effective online delivery system in a virtual learning environment. It includes assistance at the individual level, timely feedback, explanations, and appropriate presentation methods (Mashaw, 2012). Putting these studies together, what is readily apparent is that instructor motivation—through increased interaction requirements, attitudes, class preparation, and fluency with technology—directly affects presence, student-student and student-instructor interaction, and student motivation.

Theory of Transactional Distance as a Framework for Distance Learning

The theory of transactional distance as developed by Moore (1993) is the first attempt at defining distance education by means of an articulated theory which states that

distance education is not simply characterized by a geographic separation between the learner and the instructor, but it is also a pedagogical concept which describes the universe of teacher-learner relationships when constrained by the barriers of time and/or space. According to Moore (1993), the distance between the two parties creates unique patterns of learner-teacher behaviors that profoundly affect their performances in their roles in the form of psychological separations. This psychological separation is referred to as *transactional distance*.

The theory of transactional distance still stands today as one of the primary theoretical foundations of distance education which describes three variables: dialogue, structure, and autonomy of learners, and how they interact with each other to either increase or decrease the transactional distance between the instructor and the learner (Shearer, 2009). According to Falloon (2009), the nature of the transaction that exists between learners and teachers must take the three aforementioned factors into account. Dialogue pertains to more than simple two-way communication; rather, it refers to all forms of interaction that occur within the context of the learner-instructor relationship and how all these interactions culminate to a attaining the educational targets of the students. Moreover, dialogue must be of good quality more so than frequency (Falloon, 2009).

The concept of transactional distance pertains more to the psychological separation that exists between the two parties than to the physical or geographical separation. This gap, however, may be bridged by introducing appropriate levels of interaction, structure, and autonomy into the teacher-student relationship (Shearer, 2009; Benson & Samarawickrema, 2009). Shearer (2009) studied dialogue in online learning

and found that dialogue is a key variable in the theory with previous findings showing that dialogue alone actually has the potential of determining the transactional distance. At a macro-level, the theory actually implies that an increase in dialogue would effectively decrease the transactional distance because students achieve a greater sense of connectedness or belonging to the learning environment that also lessens the potential for miscommunication.

The structure of the program represents the flexibility or the rigidity of the system's objectives, strategies, and methods for evaluation as well as the extent to which programs are able to adapt to the needs of the students at more isolated levels (Moore, 1993). It is the extent to which the procedures for the implementation of the program are prepared to meet certain objectives. It is often perceived as a measure of the program's ability to adapt to the needs of the students (Shearer, 2009). Finally, learner autonomy is described by Moore (1993) as the extent to which the learner determines the goals, procedures, and resources to be used in the learning-teaching relationship; essentially, it is tied to the learner's sense of self-determination and direction.

Falloon (2009) says that the theory by Moore (1993) posits the existence of inverse relationships between the three factors in that the increase in one factor causes the decrease in the others. For instance, a course with inflexible structures often decreases the dialogue quality and the sense of autonomy that the students feel. Naylor et al. (2009) says that transactional distance is decreased by low dialogue and high structure; however, increasing the autonomy of the student can help aid the limitations placed by the inflexible nature of the course program itself. Because online learning often has lower

degrees of dialogue and higher structure, online students are often expected to have high levels of learner autonomy and self-motivation.

Transactional distance provides a framework for understanding the more usual cases of attrition in distance-learning setups than in traditional education. It has also been used to understand the factors that influence the dropout tendencies of students by understanding the structure of the system as well as the individualized characteristics of the students in relation to the interactions that they have with the other entities participating in the environment in which they are moving. The followings section attempts to explore the virtual classroom as a means of aiding the transactional distance between learners and instructors by attempting to simulate the dialogue, structure, and level of learner autonomy of the traditional classroom and how effective it has been for learners.

Live Virtual Classroom Mirroring the Traditional Classroom

As addressed above, instructor motivation and skill directly affect student motivation. Part of this skill involves use of appropriate technology to create a virtual classroom, which enhances interaction between students and instructors, thus improving overall student motivation and satisfaction. The college's live virtual classroom concept is an attempt to bring the advantages of synchronous learning with advanced technological tools to create a premier online learning environment that closely replicates (and takes advantage of) the traditional classroom environment (Lavolette et al., 2010).

When viewed as a shift from asynchronous to synchronous learning environments, live virtual classrooms present the opportunity to be a viable alternative to the traditional face-to-face classroom (Kruger-Ross & Waters, 2013). With personnel

stationed worldwide and reduced traveling funds, the United States military recently began using the live virtual classroom model in formal military training schools with overwhelming success (Touchette, 2014). Montana Air National Guard airmen participated in the Airman Leadership School formal class with over 20 satellite locations nationwide participating and interacting in classes led by instructors in Tennessee (Touchette, 2014). The live virtual classroom learning environment can be an extraordinary experience, retained in the student's long-term memory if the student is motivated by student-student and student-instructor synchronous engagement and interactions (presence and immediacy). Students who are not motivated may drift off and daydream while simply watching a unidirectional lecture in a non-engaging presentation format with a television-like experience (Sinkovics, Haghirian, & Yu, 2009).

McBrien et al., (2009) studied data from six undergraduate and graduate courses which made use of virtual classroom spaces as they explored the role of the virtual classroom in distance education and how it is able to facilitate student engagement in online learning environments. The authors suggest that the use of synchronous conferencing technique in the virtual classroom space can help enhance the dialogue and provide opportunities for social interaction. They also used the theory of transactional distance as a framework for emphasizing the importance of synchronous online learning thereby validating the benefits of distance learning since the tools that it combines into a single interface can help students interact in real-time. Thus, they have the power of increasing the dialogue more so than one-way methods of communication can (McBrien et al., 2009).

The study by Martin et al. (2012) aimed to observe how the integration of synchronous communication in online courses improved the sense of immediacy, socio-emotional interaction, and student engagement and how different types of interactions were encouraged by synchronous learning approaches. They conducted open-ended surveys to obtain detailed accounts of student experiences with interaction in virtual classrooms and found that students typically agreed that virtual classrooms assisted their interactions in various categories. The study validated claims that virtual classrooms enabled different patterns and forms of interactions. The increased quality of interactions enabled by virtual classrooms increased the meaningful and engaging experiences of the students.

Akhras (2012) did a study assessing the performance of graduate students when tasked to use CMS collaborative learning tools to work on an assignment rather than working on them collaboratively and face-to-face. The study was done on 126 graduate-level students attending a business course, who were divided into control and experimental groups. The case study showed that as business graduate students aimed to collaborate in the virtual classroom or through discussion forums, their knowledge repository showed increased performance and involvement. The study showed that there is a net benefit in integrating virtual classrooms into the business courses offered in higher education as means of extending the students' social networks and improve their overall learning.

Student interaction is possible in the live virtual classroom experience, but requires preparation and site coordination between the various classrooms and students (Sinkovics et al., 2009). However, the effectiveness of distance learning is influenced by

the tools and abilities of the students (Buche, Davis, & Vician, 2012). While computers and other devices of information technology are common in education environments, inconsistent usage, variations in individual competence, and inconsistent performance should be expected (Buche et al., 2012). Furthermore, Buche et al. (2012) suggested that individuals not only differ in their acceptance of technology, but also in how they choose to use the online resources to meet their educational goals. Individuals who are less academically proficient are more likely to have bad performance in class if they are also less accommodating and competent with technology. Instructors will need to take practical actions to allow for differing levels of technology acceptance and proficiency in the student audience (Buche et al., 2012).

Technological issues can be a significant distraction, with multiple opportunities for instructors to lose the attention of the live virtual classroom students. McBrien et al. (2009) considered poorly functioning microphones, inability to properly log onto the site, and overwhelming methods of engagement a major weakness. Mackey and Freyberg (2010) identified audio problems as having a much greater effect on student satisfaction as compared to video problems. However, several different lighting types have not been consistently demonstrated to affect student satisfaction or learning (Scharf, 1987). Text chat provides student-to-student and student-to-teacher interactions, as well as feedback check opportunities, while the use of electronic breakout rooms facilitate small group discussions and increase student-to-student interactions (Martin et al., 2012).

As such, the college in this study requires instructors to be certified for proper and professional use of the virtual software and hardware suite, to include working with students of various technical competencies. Two training sessions (minimum) are

conducted with a software and hardware expert, with the final session being a class presentation conducted as a certification exercise. Second, the college requires minimum hardware requirements for students to enroll in a virtual classroom course. All classes are recorded and subject to review by supervising faculty and administration.

Summary

It can be concluded from the available literature that there has been a tremendous growth of online instruction for the purposes of distance learning in advanced education in the past decade. Previous efforts in distance learning were primarily asynchronous learning environments (Internet, Web-based, DVD). Since then, new generations of distance learning have found their way into practice and have shown potential for improving the student's experiences with learning outside the traditional classroom. Researchers are beginning to accept the notion that distance learning is effective, and are now concentrating on determining which forms of distance learning are most effective with respect to student outcomes. One portion of effective learning environment is student satisfaction, as this directly relates to a higher rate of retention and overall success, affecting the financial position of various educational programs.

Moore's (1993) theory of transactional distance provides a method to predict student outcomes by measuring transactional distance. A pillar of transactional distance is dialogue, which can be further broken down in the distance-learning classroom as presence and immediacy (Falloon, 2011; Shin, 2003). If the classroom experience of a synchronous live virtual classroom reduces transactional distance by improving presence and immediacy, the resultant improved student outcomes strongly suggest that investment in new technologies may benefit institutions of higher education. With very

powerful technological tools available to enhance electronic communications, the structure of the online course and the methods of distance learning have broadened sufficiently to draw a distinction between asynchronous and synchronous learning modalities. A live virtual classroom is a viable method of embracing distance learning, since it retains the efficiencies of distance education while providing a potentially more satisfying learning environment, as compared to traditional classrooms.

The college's live virtual classroom is a structured, rigorous attempt to offer high-fidelity instruction to distance learners using broadband Internet technology, sophisticated software, and modern computer electronics for display and student-instructor interaction. The college claims that the live virtual classroom provides the same learning environment and results as a traditional classroom. Moore's (1993) theory of transactional distance serves as a predictor of student satisfaction in the distance-learning environment through the concepts of reduced transactional distance, which, from the literature reviewed, is the result of both increased presence and increased interaction. The net result has been shown to be increased student motivation. If a live virtual classroom reduces transactional distance, then according to Moore's (1993) theory of transactional distance, student satisfaction will be greater, student academic performance will improve, and student attrition will decrease. Based upon the theory of transactional distance as well as the other studies associated with Moore's (1993) predictions, the efficacy of the virtual classroom as a traditional classroom environment was evaluated by this study.

Chapter 3: Research Method

The problem that was addressed in this study is the significantly higher dropout rates of students in distance-learning classrooms as compared to traditional classrooms (Allen & Seaman, 2011). These higher dropout rates for students appear to be related to key elements of transactional distance theory measures, such as teacher immediacy, teacher presence, and student interaction (Martin et al., 2012). However, these transactional distance measures can now be improved through recent developments in computer software, hardware, broadband technology, and infrastructure; these allow new virtual classrooms of non-collocated students and instructors in a synchronous venue (Lavolette et al., 2010). These live virtual classrooms may combine all the benefits of traditional live instruction with the ease and convenience of distance learning. Despite the promise of these new developments in online learning, the live virtual classroom has not yet been properly evaluated against its traditional live counterpart.

To assess efficacy of the live synchronous virtual classroom against the more traditional classroom, student outcomes (student performance, satisfaction, and attrition rates) in the live synchronous virtual classroom were examined as compared to the traditional classroom. The research conducted directly compared student outcomes for students who have enrolled in both live virtual classrooms and traditional classrooms. For this study, the student population was filtered so that all sample students had taken two virtual classroom classes and two traditional classroom classes. The instructors were the same for the courses. This was the first comparative study of student outcomes (student performance, satisfaction, and attrition rates) in a live virtual classroom versus a traditional classroom at a major national-level university.

The purpose of this quantitative quasi-experimental study was to compare student outcomes (student performance, satisfaction, and attrition rates) from a live virtual classroom to outcomes from an equivalent traditional classroom. The virtual classroom consists of non-collocated students and instructors who use modern software (computers, projectors, webcams, and broadband level bandwidth) to form a synchronous learning environment. The target population was approximately 1,000 graduate students attending five core courses for a specific post-graduate degree at a major national university, conducting classes in both geographically separated campus traditional classrooms and live virtual classrooms. According to the G*Power analysis (discussed below), the required sample size was 35 participants in each group.

The independent variable in this study is the venue of instruction: virtual classroom, or traditional classroom. There are three dependent variables in this study: student performance during the course, which will be measured by grades given by the teacher; student satisfaction, which will be measured by the end-of-course survey that each student will be given the opportunity to fill out; and student attrition rate, which will be measured by comparing the respective attrition rates of virtual and traditional classrooms after the first week of class—which is the normal add/drop period at this particular university. All three dependent variables were quantitatively evaluated using the Mann-Whitney *U* test for differences, as well as a multivariate analysis of covariance (MANCOVA) with NCSS statistical analysis software (Hintze, 2013).

The study sought to answer the following research questions that may assist college or university leaders with their virtual and traditional classroom student retention challenges:

Q1. What difference exists, if any, in the cumulative course grades between live virtual classrooms and traditional classrooms?

Q2. What difference exists, if any, in the level of student satisfaction between live virtual classrooms and traditional classrooms?

Q3. What difference exists, if any, in the level of student attrition rate between live virtual classrooms and traditional classrooms?

The following hypotheses will be tested in this research:

$H1_0$. There is no difference in the cumulative course grades between live virtual classrooms and traditional classrooms after controlling for age, GPA, and socioeconomic status.

$H1_a$. There is a significant difference in the cumulative course grades between live virtual classrooms and traditional classrooms after controlling for age, GPA, gender, and socioeconomic status.

$H2_0$. There is no difference in the level of student satisfaction between live virtual classrooms and traditional classrooms.

$H2_a$. There is a significant difference in the level of student satisfaction between live virtual classrooms and traditional classrooms.

$H3_0$. There is no difference in the level of student attrition between live virtual classrooms and traditional classrooms after controlling for age, GPA, gender, and socioeconomic status.

$H3_a$. There is a significant difference in the level of student attrition rate between live virtual classrooms and traditional classrooms after controlling for age, GPA, gender, and socioeconomic status.

Research Methods and Design(s)

This study used a quantitative quasi-experimental research design. This is because studies with quasi-experimental designs are often used to test "descriptive causal hypotheses about manipulable causes" (Shadish, Cook, & Campbell, 2002, p. 14). It is an empirical study designed to examine the causal impact of a particular variable on a well-selected population. A quasi-experimental design for this study will require that an instruction-related independent variable be manipulated; it also requires the presence of a comparison or control group (Minner, Levy, & Century, 2010). Since this study seeks to compare two different classrooms, a multiple treatment group comparison will be made, requiring a quasi-experimental design (Minner, Levy, & Century, 2010).

In the case of the study, the manipulated variable is the mode of instruction, and the researcher examined the causal impact of the venue of instruction (traditional classroom vs. live virtual classroom) on student's performance, satisfaction, and attrition levels. However, it differs from a purely experimental design in the sense that there is no random assignment of the samples into groups. Since quasi-experimental studies are considered most useful in areas where it is not feasible to conduct a randomized experiment (DeRue, Nahrang, Hollenback, & Workman, 2012), a quasi-experimental design is most suited for this study, given that it will test two groups in two teaching venues, wherein the researcher cannot dictate the venue of instruction that will be chosen by the students.

The live virtual classroom is created using modern software, high speed, broadband Internet connections, robust computer hardware, and webcam displays on large screen monitors. Students are not located in the same physical location as the

instructor. The traditional classroom consists of students and instructor geographically located in the same classroom, with traditional methods of interaction. In this study, student experience with the live virtual classroom as an alternative instructional format to traditional classroom instruction is the phenomenon that was studied, and the conclusions drawn were based upon quantitative research data. Live virtual classroom and traditional classroom student academic performance, satisfaction, and retention rates were measured and compared quantitatively. The student population was filtered so that only students who had taken two virtual classroom classes and two traditional classroom classes were part of the sample. The independent variable was the venue of instruction: Virtual classroom or traditional classroom.

Population

The population consisted of approximately 1,000 graduate students who were attending four core courses of a specific post-graduate degree in a major national university that offers both virtual classrooms and traditional classrooms. The population was narrowed down to students who had taken at least two virtual classroom core classes and at least two traditional classroom core classes. The total population was composed of 4,679 students. Approximately 31% of the population is from Florida, 6% from Pennsylvania, 6% from New York, 5% from New Jersey, and 4% from Virginia. The university represented 97 countries of origin of both their undergraduate and graduate students.

Sample

The adequate sample-size for the study was determined using a power-analysis through the G*Power software. It was found that two groups with 35 students each were

adequate in fulfilling the desired statistical power of the study. This statistical power suggests that if there are any differences to be found between two groups to be studied, and then the tests and experimentations to be conducted will be able to find this statistical disparity.

The statistical power was considered as a means of avoiding Type I and Type II errors that often arise in comparative research efforts. Type I errors occur when differences are forcibly extracted in environments or cases when they cannot be readily observed (Smith, 2004). Type II errors are characterized by situations in which the sample is not sufficiently large to draw an observation that leads to a proper distinction, especially when the context in itself indicates a potential disparity (Smith, 2004). Moreover, the sampling method was non-random because the researcher cannot dictate the students belonging to the available core classes; therefore, the sample was extracted from the available students enrolled in the four courses to be studied. The sample was not limited to the dependent and independent variables of the study; rather, there were covariates present among them in the form of demographic characteristics like age, GPA, gender, and socioeconomic backgrounds.

Materials/Instruments

This study was conducted using a live virtual classroom equipped with modern amenities including high-speed broadband Internet connections as well as robust and efficient hardware provided. Webcam feeds were displayed on large-screen monitors. The virtual classroom setup entailed a geographical separation between the students and the instructors. On the other hand, the traditional classroom consisted of the teacher and the students situated in the same classroom with traditional methods of interaction

available to them at all times. The two classrooms served as the sources of quantitative research data that were measured through academic performances, satisfaction, and retention rates

In addition, qualitative data were also extracted from a post-course survey that served as supplementary data to the findings that were extracted from the quantitative portion of the study. Specific student comments were gathered from the surveys to help support, amplify, or explain the quantitative data. The survey was administered over the duration of the college's academic, which totals 12 terms. The survey that was administered to the students consisted of 11 questions that evaluated the instructor, the delivery mode, and the overall course experience.

The evaluation questions pertinent to the instructor queried the instructor's expertise, ability to use various methods of communication with the class, availability outside of the classroom, adeptness in providing meaningful and constructive feedback, skillfulness in constructing coursework that are aligned to the course objectives, and ability to sustain the engagement and motivation of the students throughout the course. The evaluation questions regarding the delivery mode and overall course experience explored whether or not the delivery mode was preferred by the student, the overall impression surrounding the chosen medium, the clarity of the stated objectives of the course, the grading criteria and the instructions for the activities, the even distribution of workload throughout the term, the amount of hours required by the course, the relevance of the resources provided to the students, and the likelihood of the student recommending the class to someone else.

These environments and tools were used to measure the students' performances and their satisfaction; attrition rate data were obtained by counting the number of students who dropped the classes. Standard statistical analysis software (NCSS) was utilized to analyze the dependent variables of the study against the independent variables of the study.

Operational Definition of Variables

Student performance. The first dependent variable was the student performance during the course of a class, which was measured by grades assigned by the instructor. The grades were standardized as a percentage of a total of 1,000 points available in a class. Each assignment, quiz, and test was given a certain point value, and the total points attained at the end of the course determined the grade. For the comparison, classes taught by the same instructor were used for this study—the same assignments, quizzes, and tests were given.

Student satisfaction. The second dependent variable was student satisfaction that was measured by the end-of-course survey that each student had the opportunity to fill out. This survey was the standard instrument for measuring student satisfaction with the course; it was standardized for all courses, and had both Likert-scale questions of rating as well as opportunity for individual student comment. Sections of the survey addressed interactions with the instructor, the course text, hours spent working on the course, and the classroom environment. Only the portion of the survey that was numerical was used in line with the purpose of this particular study. To quantify the validity of using this instrument for the purpose of this study, a post-hoc evaluation of the internal consistency and reliability of the instrument was determined based on the

Cronbach's alpha values of the scales measuring satisfaction with the course as a whole. It was expected that the results of the Cronbach's alpha analysis indicated an acceptable level of internal consistency and reliability that was 0.70 or higher.

Student attrition. The final dependent variable was a comparison of student attrition rate from live virtual classes and traditional classes after the first week of class (which was the normal add/drop period at this particular university). Student attrition data (number of students who withdraw) was harvested from each course and classroom modality after normal add/drop period was completed. In this study, student attrition was operationalized by classifying each student with "1" signifying they completed the course or "0" signifying they dropped out from the course. This was a variable number per modality that dropped, and not a ratio.

Data Collection, Processing, and Analysis

Standard statistical analysis software (NCSS) was used to measure the dependent variables (student cumulative course grades, student satisfaction, and student attrition) against the independent variables (virtual classroom venue or traditional classroom venue) while holding constant confounding variables of age, GPA, gender, and socioeconomic status using multiple analysis of covariance (MANCOVA). To determine the adequate sample-size, a power analysis was conducted, and two groups of 35 students each were included as participants in the study. These two groups represented the students who took live-virtual courses and traditional courses.

Using the software G*Power, a power analysis was conducted to determine the required sample size for the study. Statistical power indicates the degree to which the statistical test conducted will be able to find a statistically significant difference when the

difference actually exists. This is opposed to Type I errors, where a difference is determined even when it does not exist, or to Type II errors, where the test is unable to identify a difference even when it exists (Smith, 2004). An a priori power analysis to determine the required sample size takes several factors into consideration: the desired effect size, the significance level required for the study, the desired power, and the type of test that will be conducted.

The main analysis used for this study was the Mann-Whitney *U* test for differences, and the MANCOVA, but G*Power does not have a calculation specific to MANCOVA. Rather, the G*Power analysis for MANOVA or multiple analysis of variance were used. The calculation, as explained below, still includes the covariates that were included in the study. This study had three dependent variables (student performance, student satisfaction, and student attrition), one independent variable (the type of class taken traditional or virtual), and four covariates (age, GPA, gender, and SES).

As shown in the G*Power analysis, a medium effect size was desired, with 80% power, and a statistical significance level of $p = .05$. The independent variable was accounted for in the field for "Number of Groups" while the covariates were inputted as "Number of Predictors." "Response Variables" corresponds to the number of dependent variables. The results of the analysis indicated that for this study, the required sample size, or number of participants required was 35 per group. If a larger number of samples were used for the study, then the power of the statistical tests increase correspondingly (Smith, 2004). A post hoc power analysis was conducted after the completion of the

study and determined the achieved power of the statistical tests based on the size of the sample used.

Normality diagnostics were run on the data before full analyses were conducted to ensure that the assumptions required for the Mann-Whitney *U* and the MANCOVA are fulfilled. It is necessary to conduct tests for normality of dependent variable through a Kolmogorov-Smirnov test to determine whether the assumptions of both tests were satisfied. Additional insight was gained from the quantitative data from end-of-course survey/critique and was used to address some aspects in the quantitative portion of the research because of survey participation.

Data for student cumulative course grades, student satisfaction and student attrition was collected and arranged on a Microsoft Excel spreadsheet and analyzed using NCSS (statistical analysis software) and reported descriptively. Because all five of the courses were taught via both venues (the virtual classroom and traditional classroom) they used the same syllabus; therefore, the student performance was standardized. Prior to conducting the Mann-Whitney *U* and the MANCOVA, preliminary data analysis was conducted to ensure that the assumptions required for the both tests are fulfilled. A Kolmogorov-Smirnov test was conducted to ensure that data used in the study were normally distributed.

The main objective of the study was to conduct a comparison of student cumulative course grades, student satisfaction, and student attrition rates in virtual and traditional classroom environments. To achieve this purpose, an ANOVA would have been the most appropriate analysis procedure. However, it should be considered that the students in the two groups could not differ solely based on the type of class they attend.

Other covariates, such as the students' age, intellectual capacity (as quantified by their overall GPA), gender, and socioeconomic status could affect their performance, satisfaction, and attrition rates. In consideration of this, multivariate analysis of covariance (MANCOVA) was conducted in lieu of the ANOVA.

The MANCOVA is considered an extension of the ANOVA that includes other continuous variables that affect an outcome variable (Howell, 2009). These continuous variables, also known as covariates, are not the predictor variable under investigation, but may nonetheless have an effect on the dependent variable. The use of the MANCOVA allowed the researcher to quantify the effect of the covariates on the outcome variable, and in turn, allowed for the quantification of the effect of the independent variable after the effect of the covariates. In this case, the independent variable was the type of class attended, live virtual versus traditional.

The survey was administered over the course of an academic year at the college. During this timeframe, there were 12 terms (three each for fall, winter, spring, and summer). Data was analyzed in the following steps: Number of members in the sample who did and did not return the survey, with percentages and numbers in the results section. No identifying data was available as a matter of policy by the major national-level university; therefore, no response bias could be evaluated by a respondent/non-respondent analysis by comparing demographic characteristics of non-respondents versus the respondents (Creswell & Plano Clark, 2008). For the survey, a frequency table was computed for the survey items and associated Likert scale responses, indicating perception of effectiveness and satisfaction with virtual classroom course delivery as well as perceptions related to technology associated with virtual classroom delivery compared

to the traditional classroom environment. Frequencies, percentages, and the range of scores were identified. After the descriptive statistics analysis, preliminary data analysis procedures were conducted, testing whether the data set met the assumptions required for the Mann-Whitney *U*. Student attrition was compared by numerical percentage of withdrawal rate presented in a table. Only students who withdrew after normal add/drop were counted, as the university does not classify drops in the normal add/drop period as student withdrawals.

The study focused on three research questions, with corresponding hypotheses. All research questions were resolved based on the results of the Mann-Whitney *U* test for differences and MANCOVA. For the first research question and hypotheses, the dependent variable was student cumulative course grades, operationalized as a percentage out of 1000 points that the student was able to get in the course. For the second research question and hypotheses, the dependent variable was student satisfaction, operationalized by the ratings on the end-of-course student satisfaction survey. For the third research question, the dependent variable was student attrition, with operationalization based on whether the student completed the course or dropped out. The results of the Mann-Whitney *U* and the MANCOVA were used to validate or reject the null hypotheses of the study and resolve the research questions. In particular, the results were used as the basis for determining the existence of statistically significant differences in student performance student satisfaction, and attrition rate of students in live virtual classrooms versus students in traditional classrooms. The student grades and attrition were evaluated using MANCOVA after controlling for age, GPA, gender, and socioeconomic status. The Mann-Whitney *U* test for differences was used to assess changes in the scores for the

variables of student performance, student satisfaction, and as well as differences between attrition in students of live virtual classrooms and students of traditional classroom. These differences were determined while treating the variables of age, GPA, gender, and socioeconomic status (when available) as covariates.

Assumptions

This study assumed, based on previous work on distance-learning attrition and retention, that interaction and instructor feedback possess the largest positive influence to educational success; therefore, the researcher focused on the interaction component and how synchronous tools can help yield better student performance and satisfaction results. The entire study builds upon the premise that improved interaction and decreased transactional distance at any capacity will significantly improve positive results for the overall performance of any mode of instruction.

With the dependent variables relying solely on the data that can be quantitatively extracted from the students' performance throughout the academic year, it was assumed that their satisfaction with the course, as measured through their post-course surveys, accurately depicted their satisfaction with the course. Moreover, it was assumed that students answer the post-course survey with acceptable levels of criticality, honesty, and consistency. Another assumption was the insignificance of the students' individual attributes in the review of the results of the study. The only covariates that were considered are the age, GPA, gender, and socioeconomic status of the students; beyond that, any characteristics observable was isolated and individual levels were discarded as being of no importance to the study's process.

For the purpose of statistical tests, it was assumed that dependent variables considered in the study were normally distributed. Moreover, it was also assumed that data were homogenous. The quantitative data gathered for the study were assumed to represent the constructs of student performance, student satisfaction, and student attrition. It was also assumed that the samples gathered for the study were adequate to achieve statistical validity and power for the statistical tests.

Limitations

This study took into account several limitations. First, it was limited by the assumption that the data on student satisfaction, one of the key variables in the study, accurately reflected student satisfaction levels with their courses. It is acknowledged that the veracity of the data for this variable may be questionable, since some students may answer the standardized survey in a half-hearted or inconsistent manner.

Second, it was limited by the fact that only four factors were considered as covariates for the analysis. While it was acknowledged that age, GPA, gender, and socioeconomic status might have an effect on student satisfaction, student attrition, and student performance, there are also other factors that may affect the aforementioned variables. Current employment, marital status, living situation, and numbers of dependents are potential factors. Any of these factors could affect how a student performs in class, and their satisfaction levels with traditional classrooms versus virtual classrooms. Also, it should be noted that the scores for student satisfaction could be affected by teacher quality, and not necessarily the method of delivery.

Notably, the survey methodology of the major national-level university stripped identifying data prior to collection of data. Due to this methodology, no covariates could

be established for the survey data. Lastly, the results of the study were limited to the fulfillment of the assumptions required for the statistical tests that were conducted. Should the dataset fail to meet these required assumptions, then the validity of the study results, and the subsequent conclusions that are drawn based on these results, may be found questionable.

The limitations posed by the aforementioned factors that could affect student satisfaction, student attrition, and student performance could have been handled by including these factors as covariates of the study. However, owing to the nature of data collection, which uses archival data, the procurement of this information was not possible without the knowledge of the participants. This aspect of the study will be discussed in further detail in the succeeding section on Ethical Concerns.

Delimitations

The study focused on a comparative assessment of the synchronous virtual classroom against traditional classrooms at a major national-level university. The study covered students taking four post-graduate classes in pursuance of a post-graduate degree. Therefore, the study did not ensure its own generalizability or cross-level reliability of the results because graduate students have been found to have different ways of dealing with the difficulties of non-traditional education from their undergraduate counterparts. For instance, graduate students were found to have lower levels of anxiety if given the necessary pre-course orientation (Ramos & Borte, 2012).

The study did not be cover the supplementary asynchronous tools for the virtual classroom and how they impact the overall learning process of the students. The study focused primarily on the effect of the synchronous learning environment, how this

impacted the quality of the interactions, and its subsequent influence on the students' outcomes. The study was also limited to the dependent and independent variables of the study as well as the pre-determined covariates. It was determined that if all of the individual characteristics of the students were taken into account, it would have required a higher sample size to meet the statistical power required by the experimentations and statistical tests, and could heavily complicate the analyses to be conducted. As a result, there was a need to bind the variables that played a role in the study's resulting observations.

Ethical Assurances

All the data used in analyses for this study were de-identified data. Despite this, stringent measures were implemented to ensure the privacy and confidentiality of the data that were used in this study. The hard copies of the files, such as printouts of the collected data, notes on the data, and the drafts of the reports remain locked in a filing cabinet in the researcher's office. Similarly, the electronic copies of the data are password protected and stored on the researcher's personal computer. Back-up copies of all the data are secured in a password protected flash drive and stored in the researcher's locked filing cabinet. Five years after the completion and publication of this study, all hard copies of the data will be shredded and all electronic files will be permanently deleted.

The Belmont Report specifies the acknowledgement of three basic principles when conducting research, particularly respect for persons, beneficence, and justice (NIH, 1979). In the case of this study, these specified principles were not applicable, given that the data for the study were collected using a pre-existing survey that is

normally administered at the end of a school term. At that point, the data belongs to the university and the requisite permissions were obtained prior to any data collection procedures. Similarly, the NCU and local IRB oversaw the study, which ensured that all data collection, analysis, and publication procedures were conducted with the strictest adherence and regard for ethical considerations. The students did not receive any incentives for participation because they were not informed that their data were used in this study. The decision to not inform the students of their participation was made in order to avoid prejudicial answers in favor of or against traditional or live-virtual classes. If the students were aware that their views or preferences towards one method of learning versus another could influence policies or decision regarding the delivery of classes, it could have compromised the assumed impartiality of the data. If the students perceived that the information they shared on the end of term evaluations were part of a standard evaluation, then the answers given on the survey were expected to be more impartial.

Summary

An important component of good research is a report on the validity of the data and results. Validity differs in quantitative and qualitative research, but in both approaches, it serves the purpose of checking on the quality of the data and the results (Creswell & Plano Clark, 2008). In this research of the virtual classroom, validity was addressed in the quantitative methods design by minimizing identified threats to validity. The data itself was drawn from classes taught by the same instructors—the assignments, quizzes, tests, and end-of-course surveys were the same. Finally, the student population was filtered so the sample population had taken two live virtual classroom venue classes

and two traditional classroom venue classes. Standardized statistical software commonly used for this type of analysis was used for comparison and analysis.

Chapter 4: Findings

The purpose of this quantitative quasi-experimental first-time study was to compare student outcomes (student performance, satisfaction, and attrition rates) from a live virtual classroom to outcomes from an equivalent traditional classroom at a major national-level university. To address this objective, the student outcomes of a target population at a major national-level university were analyzed. Student performance during the course was measured by grades given by the teacher. Student satisfaction was measured by the end-of-course survey that each student was given the opportunity to fill out. Student attrition rate was measured by comparing the respective attrition rates of virtual and traditional classrooms.

This chapter was guided by the following research questions and hypotheses:

Q1. What difference exists, if any, in the cumulative course grades between live virtual classrooms and traditional classrooms?

Q2. What difference exists, if any, in the level of student satisfaction between live virtual classrooms and traditional classrooms?

Q3. What difference exists, if any, in the level of student attrition rate between live virtual classrooms and traditional classrooms?

$H1_0$. There is no difference in the cumulative course grades between live virtual classrooms and traditional classrooms after controlling for age, GPA, gender, and socioeconomic status.

$H1_a$. There is a significant difference in the cumulative course grades between live virtual classrooms and traditional classrooms after controlling for age, GPA, gender, and socioeconomic status.

$H2_0$. There is no difference in the level of student satisfaction between live virtual classrooms and traditional classrooms.

$H2_a$. There is a significant difference in the level of student satisfaction between live virtual classrooms and traditional classrooms.

$H3_0$. There is no difference in the level of student attrition between live virtual classrooms and traditional classrooms after controlling for age, GPA, gender, and socioeconomic status.

$H3_a$. There is a significant difference in the level of student attrition rate between live virtual classrooms and traditional classrooms after controlling for age, GPA, gender, and socioeconomic status.

In this chapter, the results of the data analyses are presented. Descriptive statistics, including normality and variance checks, are presented for all samples. Next, the results of the MANCOVA and Mann Whitney-*U* analyses conducted to test the hypotheses are presented. These results were used to form the basis for analysis of the efficacy of a synchronous, live-virtual classroom as a replacement for the traditional classroom as predicted by Moore's (1993) theory of transactional distance. The chapter concludes with an evaluation of these results in determining if the live-virtual classroom and associated synchronous interactions using modern technology are a viable alternative classroom venue that improves student outcomes, and results in student attrition rate similar to the traditional classroom student attrition rate.

General Overview

For the grade portion of the study, total student grades assigned by teachers were standardized as a percentage of a total of 1,000 points available in each of the targeted

graduate level courses. For the comparison, the same courses in the two venues taught by the same instructor were used for this study—the same assignments, quizzes, and tests were given. Therefore, for the 10 total courses (five live virtual courses and five traditional classroom course) in the study, there were five instructors. From these targeted courses, there were originally 76 live virtual classroom students, and 62 traditional classroom students. For students to be considered for the grade portion, they must have taken at least two live virtual course and two traditional courses. This screening resulted in 47 qualified live virtual classroom students, and 35 traditional classroom students for grade analysis. Student age, GPA, gender, and socioeconomic status were collected to account for confounding factors in student grade analysis.

Student attrition data was taken from these same courses. The data was harvested from students who dropped out of either the live virtual or traditional courses after the first week of study (which is considered the normal add/drop period at the university). A total of three students withdrew of the original 138 selected from the targeted courses. Two were from live virtual courses, and one was from a traditional course. The students who withdrew were each in a different class, each with a different instructor. As a result, only limited analysis can be conducted from this data.

For the survey portion of the study, standard university-designed student surveys were evaluated for targeted courses. There were 140 total surveys distributed—78 for the live virtual classes, and 62 for traditional classes. Of those, 81 were returned—43 for live virtual classes, and 38 for traditional classes. For this study, there was a 55% return rate for live virtual classes, and 61% for traditional classes. These response rates are consistent with other classes within the university. The university guarantees student

anonymity for all surveys, and accomplishes that by removing identifying data prior to survey assimilation; therefore, there is no method available to correlate survey responses to specific student grade or attrition data, nor evaluate age, GPA, gender, and socioeconomic status data from the survey. Also, specific student comments were gathered from the surveys to help support, amplify, or explain the quantitative data.

Data Screening and Analysis—Student Performance

The Mann-Whitney *U* test is used to compare two distributions (Hintze, 2013). In this case, Research Question 1 compares the student performance (grades) of two groups (live virtual or traditional classroom students). The Mann-Whitney *U* is a nonparametric test in cases of either non-normal or non-equal variance, which is appropriate if data does not meet the specified criteria for normality, variance, or co-variance. The assumptions of the Mann-Whitney *U* are: (a) the variable of interest is continuous (not discrete) and the measurement scale is at least non-ordinal, (b) the probability of the two populations is identical except for location, (c) the samples are independent, and (d) both samples are simple random samples from their respective population.

Prior to conducting the tests for differences between the live virtual and traditional classroom modalities, preliminary screening of the grade data was conducted to assess normality and other statistical test assumptions and to assure the integrity of the findings from the analysis. This is important to assure the statistical analysis techniques used to evaluate differences between groups are appropriate, acceptable, and reasonable. Several tests were conducted on the data to check the data characteristics to select appropriate analysis methods.

The first test conducted included descriptive statistics (mean and standard deviation) while the Kolmogorov-Smirnov tests were conducted to evaluate data normality (Table 1). Next, homogeneity or equality of variances was evaluated using Levene's Test for Equality of Variances (Table 2). Finally, equality of covariance was measured using the Box's Test of Equality of Covariance Matrices (Table 3).

Table 1

Normality Testing of Student Performance Variables

	Mean	Std. Deviation	Kolmogorov-Smirnov		
	Statistic	Statistic	Statistic	Crit Value	Findings
Student Performance (Dependent variable 1)					
Course 1					
LV	919.8	98.23	0.295	0.219	Reject Normality
Trad	957.5	24.75	0.260	0.472	Cannot Reject Normality
Course 2					
LV	860.5	35.70	0.186	0.323	Cannot Reject Normality
Trad	820.3	77.91	0.183	0.288	Cannot Reject Normality
Course 3					
LV	968.0	15.31	0.172	0.288	Cannot Reject Normality
Trad	975.0	50.00	0.309	0.376	Cannot Reject Normality
Course 4					
LV	915.5	41.40	0.135	0.288	Cannot Reject Normality
Trad	920.7	29.72	0.104	0.234	Cannot Reject Normality

Course 5					
LV	913.8	42.24	0.139	0.262	Cannot Reject Normality
Trad	920.0	59.96	0.166	0.288	Cannot Reject Normality

Table 2

Variance Testing of Student Performance Variables

	Levene Statistic	Sig.	Findings
Course 1	0.000	0.000	Reject Equal Variance
Course 2	0.081	0.781	Cannot Reject Equal Variance
Course 3	0.600	0.457	Cannot Reject Equal Variance
Course 4	0.187	0.670	Cannot Reject Equal Variance
Course 5	0.2511	0.623	Cannot Reject Equal Variance

Table 3

Homogeneity of Covariance Testing of Student Performance Variables

Box's Test of Equality of Covariance Matrices	
Box's M	10.865
F	0.67
df1	15
df2	21472
Sig.	0.813

Prior to conducting a MANCOVA test, assumption criteria should be evaluated and satisfied for the test to be considered valid: (a) two or more independent variables should be continuous variables, (b) the sample data should follow multivariate normality, (c) each group variances and covariance are equal, and (d) the individuals are independent (Hintze, 2013). MANCOVA was used to evaluate influence of confounding factors (age, GPA, gender, and socioeconomic status) on student performance for Research Question 1.

The MANCOVA uses independent variables of age, GPA, gender, and socioeconomic status. The first assumption is satisfied because the independent variable of gender consists of two categorical independent groups (male or female). Socioeconomic status is defined for the purposes of this study as either military sponsored tuition or not, since those using military tuition assistance are in the military, their general income level, benefit level, and overall economic status are equivalent. Age and GPA are unrelated between individuals. The second requirement of normality is met for all but one class using the Kolmogorov-Smirnov test. The third requirement of equal variances was met by all courses except Course 1 using Levene's Test for Equality of Variances. Covariance criteria were met with the Box-M Test of Equality of Matrices between the groups. The final measure of independence of individuals in each venue is inherent in the design, since it is unlikely for students to retake the same course in a different venue unless there were unusual circumstances (course failure, course incompletion, etc.). Prior screening confirmed no students were duplicated in this data collection. Course 1 had only two students in one venue who qualified after screening;

therefore, the data was insufficient to properly determine normality, variance, and covariance. Thus, MANCOVA was appropriate to test for differences of student performance in all courses, except for Course 1.

Data Screening and Analysis—Student Surveys

The Mann-Whitney *U* test was used to compare two distributions (Hintze, 2013). In this case, Research Question 2 compares the student satisfaction of two groups (live virtual or traditional classroom students). Furthermore, additional questions on the survey are analyzed to determine if those secondary factors have any association with student satisfaction and modality.

Prior to conducting the tests for differences between the live virtual and traditional classroom modalities, preliminary screening of the survey data was conducted to assure the integrity of the findings from the analysis. The methods and testing were the same as in the prior section (Tables 4, 5 and 6). In addition, the Cronbach's alpha values of the scales measuring satisfaction measured internal consistency of 0.9145 for this survey instrument, which exceeds the desired minimum desired value of 0.70.

Table 4

Normality Testing of Survey Questions

	M	*SD*	Kolmogorov-Smirnov		
	Statistic	Statistic	Statistic	Std. Error	Findings
Student Satisfaction (Live Virtual Classroom-Dependent variable 2)					
SQ1	4.61	0.123	0.387	0.132	Reject Normality
SQ2	4.58	0.121	0.375	0.134	Reject Normality
SQ3	4.41	0.153	0.346	0.134	Reject Normality

SQ4	4.44	0.983	0.343	0.134	Reject Normality
SQ5	4.54	0.128	0.363	0.132	Reject Normality
SQ6	4.11	0.153	0.296	0.132	Reject Normality
SQ7	4.20	0.140	0.277	0.132	Reject Normality
SQ8	4.41	0.161	0.330	0.134	Reject Normality
SQ9	4.42	0.141	0.329	0.135	Reject Normality
SQ10	3.50	0.164	0.268	0.132	Reject Normality
SQ11	4.25	0.156	0.288	0.132	Reject Normality

Table 5

Normality Testing of Survey Questions

	Mean	Std. Deviation	Kolmogorov-Smirnov		
	Statistic	Statistic	Statistic	Crit Value	Findings
Student Satisfaction (Traditional Classroom-Dependent variable 2)					
SQ1	4.90	0.307	0.502	0.140	Reject Normality
SQ2	4.79	0.615	0.476	0.140	Reject Normality
SQ3	4.82	0.556	0.473	0.140	Reject Normality
SQ4	4.76	0.542	0.458	0.142	Reject Normality
SQ5	4.89	0.388	0.501	0.142	Reject Normality
SQ6	4.85	0.540	0.484	0.140	Reject Normality
SQ7	4.85	0.540	0.484	0.140	Reject Normality
SQ8	4.82	0.072	0.475	0.140	Reject Normality
SQ9	4.77	0.583	0.449	0.140	Reject Normality

SQ10	3.74	0.850	0.260	0.140	Reject Normality
SQ11	4.68	0.620	0.432	0.142	Reject Normality

Table 6

Variance Testing of Survey Questions

	Levene Statistic	Sig.	Findings
SQ1	4.212	0.043	Reject Equal
SQ2	1.826	0.180	Cannot Reject Equal
SQ3	4.875	0.030	Reject Equal
SQ4	3.196	0.078	Cannot Reject Equal
SQ5	5.454	0.022	Reject Equal
SQ6	11.57	0.001	Reject Equal
SQ7	10.57	0.002	Reject Equal
SQ8	4.316	0.042	Reject Equal
SQ9	3.927	0.051	Cannot Reject Equal
SQ10	2.156	0.146	Cannot Reject Equal
SQ11	5.087	0.027	Reject Equal

Results

Research Question 1. "What difference exists, if any, in the cumulative course grades between live virtual classrooms and traditional classrooms?"

To assess this research question, the Mann-Whitney *U* test was conducted to compare across live virtual versus traditional classes scores/total points earned. The significance level was set at $p < .05$, and the results are in Table 7.

Table 7

Mann-Whitney U Test for Difference of Classroom Venue

	Live Virtual			Traditional					
Course	*M* of W	*SD* of W	*U*	*M* of W	*SD* of W	*U*	Z Value	Prob Level	Findings
1	135	6.70	12.5	18	6.70	17.5	0.373	0.709	Cannot Rej Eq
2	45	7.74	30.5	60	7.74	17.5	0.840	0.401	Cannot Rej Eq
3	52	5.85	8.0	26	5.85	24.0	1.368	0.171	Cannot Rej Eq
4	88	13.79	51.0	143	13.79	53.0	-0.725	0.942	Cannot Rej Eq
5	95	11.12	30.5	76	11.12	49.5	0.845	0.398	Cannot Rej Eq

As can be gleaned from the results presented in Table 7, none of the courses showed a statistically significant difference in student grades between live virtual and traditional courses. Course 1 had insufficient qualifying students in the traditional classroom venue for valid statistical determination of difference. Course 4 showed the least difference between live virtual classroom ($M = 88$, $SD = 13.79$, $U = 51$) and traditional classroom ($M = 143$, $SD = 13.79$, $U = 53$) with $p = .942$. Course 3 showed the greatest difference between live virtual classroom ($M = 52$, $SD = 5.85$, $U = 8$) and traditional classroom ($M = 26$, $SD = 5.85$, $U = 24$) with $p = .171$.

The MANCOVA analysis was used to compare student performance after controlling for confounding factors (age, GPA, gender, and socioeconomic status). Significance level was set at $p < 0.05$, and the results are in Table 8.

Table 8

MANCOVA Results for Differences of Classroom Venue

	df1	df2	*F*-Value	*p*-Level	Findings (0.05)
Venue	1	76	1.15	0.286	Cannot Reject Equal
Gender	1	76	2.49	0.119	Cannot Reject Equal
SES	1	76	0.29	0.593	Cannot Reject Equal
GPA	30	76	14.55	0.003	Reject Equal
Age	31	76	0.04	0.841	Cannot Reject Equal

After controlling for the different confounding factors (age, GPA, gender, and socioeconomic status), no student performance scores were statistically different between the live virtual classroom and traditional classroom venues with F (1, 76) = 1.015, $p = .286$. GPA, however, did show a statistically significant relationship to total points earned. Overall, the results are as predicted by numerous studies showing that student performance (grades) in distance learning—both synchronous and asynchronous— are equivalent, given an appropriate level of instruction, interaction, and evaluation of higher-ordered thinking capabilities required for learning in the venue (Andrews, 2010).

$H1_0$. There is no difference in the cumulative course grades between live virtual classrooms and traditional classrooms after controlling for age, GPA, gender, and socioeconomic status.

Hypothesis 1 was not rejected because there were no significant differences ($p < .05$) between the performance of live virtual classroom students and traditional classroom students. There were no differences in performances ($p < .05$) when controlling for age, GPA, gender, and socioeconomic status.

Research Question 2. "What difference exists, if any, in the level of student satisfaction between live virtual classrooms and traditional classrooms?"

To address this question, a Mann-Whitney *U* test was conducted to determine if there was a difference ($p < .05$) in student responses to survey items from live virtual classroom versus traditional classroom venues. The independent variable was classroom venue (live virtual or traditional). The response variables were measured with a 5-point Likert-type scale (survey questions 1-9). Question 10 was a categorical estimation of hours studied per week, and Question 11 was a Likert-type scale response to assess probability of recommendation of the class (including venue) to future students. Questions 6 and 7 are primary questions indicating student preference of classroom type. The remaining questions are supporting (secondary) questions used to identify potential correlating factors to help understand student responses to questions 6 and 7.

In addition, student surveys allowed for students to provide comments concerning different sections of the survey. Students were provided the opportunity to freely comment to provide additional insights into their numerical responses to the different categories in the survey that were numerically rated using the Likert-type scale. Student comments and written responses were harvested from the section containing Survey Questions 6 and 7 to gain additional insight into opinions conveyed via numerical evaluation of the live virtual classroom and the traditional classroom venues. These

comments also were used to identify areas of student concern that might not be identified with the supporting (secondary) questions on the survey. See Appendix B for a listing of survey questions.

Table 9

Mann-Whitney U Test for Survey Differences in Classroom Venue

	Live Virtual			Traditional					
	M of W	*SD* of W	*U*	*M* of W	*SD* of W	*U*	*z*-Value	*p*-Level	Findings
SQ1	1848	75.08	708	1638	75.08	1008	1.998	0.046	Cannot Rej Eq
SQ2	1784	77.71	698	1618	77.71	979	1.808	0.071	Cannot Rej Eq
SQ3	1784	80.86	647	1618	80.86	1030	2.368	0.018	Cannot Rej Eq
SQ4	1763	82.33	678	1558	82.32	956	1.689	0.913	Cannot Rej Eq
SQ5	1826	75.89	638	1577	75.89	1035	2.616	0.009	Cannot Rej Eq
SQ6	1848	93.64	421	1638	93.64	1295	4.667	0.001	Reject Equal
SQ7	1848	92.71	443	1638	92.71	1274	4.482	0.001	Reject Equal
SQ8	1784	81.98	672	1618	81.98	1005	2.031	0.422	Cannot Rej Eq
SQ9	1722	83.55	646	1599	83.55	993	2.077	0.038	Cannot Rej Eq
SQ10	1848	102.40	773	1638	102.40	944	0.835	0.404	Cannot Rej Eq
SQ11	1826	91.21	641	1577	91.21	1032	2.143	0.032	Cannot Rej Eq

Note. The findings for critical *p* values presented in this table include a Bonferroni correction of $p < .004545$ and *z*-value > = 2.8376 based upon the need for correction for multiple tests (Type I error—false positives).

Table 9 presents results of the Mann-Whitney *U* test for the survey questions. Survey Question 6 showed a significant difference ($p < .004545$ with the Bonferroni correction) between live virtual classroom venue ($M = 1848$, $SD = 93.64$, $U = 421$) and

the traditional classroom venue (M = 1638, SD = 93.64, U = 1295) with $p < .001$, overall preferring the traditional classroom. Survey Question 7 showed a significant difference ($p < .004545$ with the Bonferroni correction) between live virtual classroom venue (M = 1848, SD = 92.71, U = 443) and the traditional classroom venue (M = 1638, SD = 92.71, U = 1274) with $p < .001$, overall preferring the traditional classroom venue. None of the supporting Survey Questions showed a significant difference ($p < .05$) between live virtual classroom and traditional classroom venues.

Survey comments concerning Survey Questions 6 and 7

All live virtual classroom student comments are included in Appendix C. Of the original 81 survey respondents (43 live virtual and 38 traditional classroom students), there were 37 written responses (11 live virtual and 26 traditional classroom students) in the optional section of the survey specifically addressing preference in class venue (the primary survey questions identified for this study—SQ 5 and SQ 6). The comments were not separated specifically between the two questions. Of the 11 live virtual students who wrote in amplifying information, three preferred live virtual classes, while three preferred traditional classes. Three reported technical problems interfering with classroom activities as distractors while two specifically identified the flexibility of live virtual classrooms as indicated by this quote: "I love [live virtual] classes, they're a fantastic concept and I prefer them above any other delivery mode because they still allow me to have face-time with the instructor while being able to spend time with my family." One student identified the wider ranging student interactions as a positive associated with live virtual classrooms. There were no negative comments about the technology used in the traditional classroom venue.

Of the 26 traditional classroom student survey written responses concerning classroom venue preference, 14 specifically identified the traditional classroom (and face-to-face interface) as a preference over live virtual. A subset of those comments included a preference of live virtual (as a synchronous mode of delivery and interaction) over an asynchronous (online only) classroom venue in several comments. No traditional classroom student indicated a preference for live virtual classroom venues over traditional classroom venues. Three students registered complaints about technical issues distracting from the class as evidenced by this quote: "There was not a single class this term in which we did not have a massive failure with [live virtual]."

As an entire group of respondents, 17 of 38 (44.4%) of the written comments from both venues favored traditional classroom venues over live virtual classrooms. Three of 38 (7.9%) favored live virtual classrooms over traditional classrooms. Overall, the comments about the flexibility of classroom location and student interaction scope were in line with Hrastinksi (2008), in that the synchronous interactions in a live-virtual classroom encouraged development of learning communities. The comments also supported the anecdotal evidence presented by Ellingson and Nothbohm (2012), who observed students building strong engagement and strong collaborate, interpersonal relationships in a live-virtual synchronous environment. The primary impediment to preference of live-virtual classroom venues rather than traditional classroom venues was technology issues. The other impediment was not identified by this survey, and appears to be the relatively trivial reason of familiarity.

$H2_0$. There is no difference in the level of student satisfaction between live virtual classrooms and traditional classrooms.

Hypothesis 2 was rejected based upon the Mann-Whitney *U* test. There was a significant ($p < .05$) difference between the responses to both SQ6 and SQ7 in terms of preferred modality. Secondly, optional individual student survey comments indicated an overwhelming preference for traditional class venue.

Research Question 3. "What difference exists, if any, in the level of student attrition rate between live virtual classrooms and traditional classrooms?"

Of the surveyed student population of 138, only three students dropped out: two of 76 live virtual students (one each from separate live virtual classes), and one of 62 traditional students from a single traditional class. There was insufficient data to support any testing beyond these basic numbers. However, the very low attrition rate measured in this study associated with distance learning is a departure from previous studies which showed a 10-20% greater attrition rate in distance learning than traditional online classroom venues (Fetzner, 2013).

$H3_0$. There is no difference in the level of student attrition between live virtual classrooms and traditional classrooms after controlling for age, GPA, gender, and socioeconomic status.

Hypothesis 3 was rejected because there was no significant difference between dropout rates between the two classroom venues.

Evaluation of Findings

Research Question 1: "What difference exists, if any, in the cumulative course grades between live virtual classrooms and traditional classrooms?"

As can be gleaned from Table 8, there were no significant differences between student grades/scores in live virtual or traditional classrooms. In addition, from Table 9,

there were no significant differences between these classroom venues when controlling for age, GPA, gender, and socioeconomic status. This is consistent with previously cited studies that show no substantial difference in student performance in synchronous and asynchronous classroom environments.

$H1_0$. There is no difference in the cumulative course grades between live virtual classrooms and traditional classrooms after controlling for age, GPA, gender, and socioeconomic status.

Hypothesis 1 was not rejected because there were no significant differences between the performance of live virtual classroom students and traditional classroom students. There were no differences in performances when controlling for age, GPA, gender, and socioeconomic status.

Research Question 2. "What difference exists, if any, in the level of student satisfaction between live virtual classrooms and traditional classrooms?"

As can be gleaned from Table 10, there were differences in answers from live virtual classroom versus traditional classroom students. Both Survey Questions 6 and 7 showed a significant ($p < .001$) difference between student preferences of traditional classroom venue versus live virtual classroom venue, with students preferring the traditional classroom venue by a Mann-Whitney *U* factor of 3 times the live virtual classroom venue Mann-Whitney *U* statistic. In the Mann-Whitney *U* test, no supporting questions show a significant difference ($p < .05$) between instructor methods of communication to students. Individual student comments strongly support the quantitative analysis. This supports the concept that transactional distance is reduced by the live-virtual classroom, as students specifically mention interaction with different

students and a more varied, technologically savvy, group of instructors using modern technology techniques that preclude the need for a face-to-fact traditional classroom.

$H2_0$. There is no significant difference in the level of student satisfaction between live virtual classrooms and traditional classrooms.

Hypothesis 2 was rejected because there was a significant ($p < .05$) difference between survey responses in terms of preferred modality. In particular, the traditional classroom venue was preferred rather than the live virtual venue. Student free-form comments also favored the traditional classroom venue rather than the live virtual venue. Since no specific identifying secondary student survey data yielded any aspects of the live-virtual classroom in favor of the traditional classroom venue, one potential cause of this preference is simply student familiarity with traditional classroom venue.

Research Question 3. "What difference exists, if any, in the level of student attrition rate between live virtual classrooms and traditional classrooms?"

Of the surveyed student population of 138, only three students dropped out: two of 76 live virtual students (one each from separate live virtual classes), and one of 62 traditional students from a single traditional class.

$H3_0$. There is no difference in the level of student attrition between live virtual classrooms and traditional classrooms after controlling for age, GPA, gender, and socioeconomic status.

Hypothesis 3 was not rejected because there was no significant difference between dropout rates between the two classroom venues. This finding supports the original theory of reduced transactional distance improving student outcomes as a result

of improved student satisfaction from more timely interaction between students and instructors (Moore, 1993).

Summary

The purpose of this quantitative quasi-experimental first-time study was to compare student outcomes (student performance, satisfaction, and attrition rates) from a live virtual classroom to outcomes from an equivalent traditional classroom at a major national-level university. To address this objective, the student outcomes of a target population at a major national-level university were analyzed. Student performance during the course was measured by grades given by the teacher. Student satisfaction was measured by the end-of-course survey that each student was given the opportunity to fill out. Student attrition rate was measured by comparing the respective attrition rates of live virtual and traditional classrooms.

Mann-Whitney *U* and MANCOVA analyses were conducted to test the study's hypotheses. The findings show that student performance is not significantly different between the live virtual classroom and traditional classroom venue. Confounding variables of age, GPA, gender, and socioeconomic status did not affect this observation. Likewise, it was found that no significant difference exists in dropout rate between the two classroom venues. Finally, student surveys did show a significant difference in student survey preference between live virtual and traditional classroom venues. Students were more likely to prefer the traditional classroom venue instead of live virtual classroom venue, although supporting survey questions did not identify any specific areas of difference beyond student preference. The general areas of these supporting questions included student-instructor interactions, instructor feedback, instructor usage of

technology, instructor availability, total hours worked on the course, as well as likelihood to recommend the class to potential students. Student written comments showed a strong preference for traditional classroom venue over live virtual classroom venue. Several themes from the written comments include the preference for face-to-face interaction associated with traditional classrooms, as well as several strong complaints about technological limitations and frustrations with the live virtual classroom. Positive comments for the live virtual classroom modality included increased flexibility and exposure to a more varied population of students.

Chapter 5: Implications, Recommendations, and Conclusions

Dropout rates of students in distance learning classrooms are significantly higher as compared to traditional classrooms (Allen & Seaman, 2011). These higher dropout rates for students appear to be related to key elements of transactional distance theory measures, such as teacher immediacy, teacher presence, and student interaction (Martin et al., 2012). However, these transactional distance measures can now be improved through recent developments in computer software, hardware, broadband technology, and infrastructure; these advances allow new live virtual classrooms of non-collocated students and instructors to meet in a synchronous venue (Lavolette et al., 2010). These live virtual classrooms may combine all the benefits of traditional live instruction with the ease and convenience of distance learning.

Interaction is the most important aspect of distance education because no learning can occur without the existence of interactions between students and instructors as well as between students and students. Understanding the importance of interaction could benefit facilitators of distance education by addressing the effectiveness or non-effectiveness of synchronous distance education in teaching students in a way that achieves their learning objectives in an enthusiastic and driven manner. Although virtual classrooms may be associated with significant benefits in terms of flexibility and adaptability, distance learning continues to suffer issues with the retention of students under the wing of the institution. A relatively large number of students end up non-completing their courses due to several possible external or internal factors such as persistence, motivation, quality of interactions, structure of the course, or the level of autonomy of the student, among others.

The research problem for this study was to compare a live virtual classroom venue with a traditional classroom venue. The primary objective of this study is to identify the efficacy of synchronous tools used in virtual classrooms as compared to traditional classes. The goal of the study was to aid university decision makers by addressing the effectiveness or non-effectiveness of synchronous distance education in teaching students in a way that achieves their learning objectives in an enthusiastic and driven manner. By identifying the strengths and weaknesses of the synchronous virtual classroom, higher education institutions could have a first basis of comparison of traditional learning systems and actual live virtual classrooms that mimic the nature of the traditional classroom. The results of this study could serve as a scaffold for future research efforts aiming to improve distance learning to a level that could equal the efficacy of traditional classrooms and potentially decrease attrition rates as a result of improved student perception and satisfaction.

This study was conducted by gathering information drawn from the core courses offered at a major national-level university that offers live virtual and traditional courses. Student performance, student attrition, and student satisfaction data were gathered from five core courses taught at the major national-level university in both live virtual and traditional classes. The same instructors taught the courses selected in both venues over the course of a 12-month period. Student performance data was obtained from grades earned throughout the courses. These grades provided data regarding student performance in the different classroom venues. Student attrition rate data were obtained from university records harvested after the first week of class was completed, and provided data concerning student completion rate for the courses measured.

Student satisfaction data were gathered from the standard student survey offered to all students upon completion of the course. The participants were asked, via the school's standard survey instrument offered after each class, to answer questions concerning preference of classroom venue, as well as supporting information concerning instructor use of technology, instructor and student interactions, clarity of instructions, hours worked toward the class, and likelihood of recommending the class to others. The responses to these surveys provided data indicating student preference of classroom venue as well as providing supporting data for insight into possible reasons for differences in student satisfaction. The survey also gave students an opportunity to write amplifying information in different sections of the survey. This qualitative data amplified numerical results of statistical tests of the survey results.

The study had several limitations. The first limitation of the study is that the data were only gathered at only one major national-level university with offerings in both live virtual and traditional classes. Second, the students and classes selected for this study may not apply to the larger population of students at other schools. For this particular study, 55% of the live virtual students returned surveys, and 61% of the traditional classroom students returned surveys; therefore, the survey results may not completely represent the student population. Next, the study was at the graduate level of study, which implies a more seasoned student with a potentially stronger intrinsic motivation to perform and more mature approach to learning regardless of classroom venue. Because of the changing nature of classroom venues and the technology supporting the live virtual classroom, the study may not represent current student performance, student attrition rate, or student satisfaction. Therefore, the results of this study should not be generalized

beyond the graduate student population of the major national-level university used in the study.

Prior to data collection, Institutional Review Board approval was attained from Northcentral University and the major national-level university in which the research participants were enrolled. Prior to analysis, data were stripped of all personally identifying information to protect the participants. Survey data did not contain any identifiable information as a matter of policy as mandated by the major national-level university.

In the remainder of this chapter, the implications, recommendations, and conclusions of this study are presented. The final section of the chapter presents conclusions drawn from the findings.

Implications

Data were obtained and analyzed from five graduate level courses taught in live virtual classroom and traditional classroom venues at a major national-level university. The data includes student grades, student attrition rate, and student survey results. The scores from the grades were used to determine differences in student performance between the live virtual classroom and traditional classroom venues. The student attrition rate was analyzed to determine student motivation to stay in live virtual classrooms versus traditional classrooms. The student survey data were used to determine differences between the student satisfaction and preference for classroom venue after completing the courses. The research questions are presented followed by the findings.

Research Question 1: “What difference exists, if any, in the cumulative course grades between live virtual classrooms and traditional classrooms?”

$H1_0$. There is no difference in the cumulative course grades between live virtual classrooms and traditional classrooms after controlling for age, GPA, gender, and socioeconomic status.

To answer the first research question, a series of Mann-Whitney *U* and MANCOVA analyses were conducted to compare two distributions, while controlling for the covariates. There was no significant difference in student grades when comparing live virtual classrooms versus traditional classroom venues.

This finding is consistent with previous research by Andrews (2010) who compared traditional classroom-based instruction to online courses and found the outcomes in terms of student performance to be similar. The finding is also consistent with Moore's (1993) theory of transactional distance that predicts equivalent student performance in the live virtual classroom relative to the traditional classroom setting, since the students have the opportunity to interact in a timely (synchronous) manner with the instructor and other students. As Kruger-Ross and Waters (2013) predicted, from a performance standpoint, the live virtual classroom does appear to be a viable alternative to the traditional face-to-face classroom. McBrien et al. (2009), who also explored the concept of transactional distance as a framework for emphasizing online synchronous learning venues, were supported by the finding. The interface can help students interact in real time and thus have the power of increasing dialogue more so than one-way (asynchronous) communications. Findings of this study also support Akhras' (2012) recommendation for incorporation of live virtual classrooms for business courses offered in higher education as a result of the increased knowledge repository and improved overall learning as a result of collaboration in the virtual classroom.

There are several confounding factors to this finding worth noting. First, the evaluation of student performance from a tally of points earned during a course is limited by variability of instructor grading methods. Furthermore, the variability was exacerbated by candidate elimination (students must have had two live virtual and two traditional courses to be considered for this study) requiring a fifth course to meet the minimum number of students required for the study to be valid. Furthermore, the designs of the courses were not a part of the study, thus making possible unaccounted-for confounding factors in the findings. Some classes might not lend themselves to factors considered important to this study, including student interaction. As a result, student performance in a particular class (regardless of venue) could be more a result of book comprehension or ability to write and express thoughts via formal papers.

Beyond these study limitations, a larger issue exists when using grades as sole measurement of student performance. A more rigorous, standardized, controlled testing process at the completion of identical courses taught by the same instructors would potentially discriminate student-learning achievement between the two classroom venues. Because the students were not the same in the classes, student variability cannot be completely discounted. Therefore, a larger sample size over the course of a longer period of time, including more varied classes in other parts of the school, present opportunities to refine data that might provide more insight in discriminating student performance between the two venues.

Hypothesis 1 was not rejected because there was no significant difference in student performance, as measured by final grades, in live virtual classrooms versus traditional classrooms. Graduate level student performance at the major national-level

university does not differ between live virtual classroom and traditional classroom venues.

Research Question 2: "What difference exists, if any, in the level of student satisfaction between live virtual classrooms and traditional classrooms?"

$H2_0$. There is no difference in the level of student satisfaction between live virtual classrooms and traditional classrooms.

To answer the second research question, a Mann-Whitney *U* test was conducted to test for differences in a standard student survey given at the end of each course, containing 11 questions relevant to this research. There were two primary questions that specifically asked student preference between live virtual classrooms versus traditional classrooms. The remaining questions were identified as supporting questions to help identify reasons for student preference of one venue versus the other. Finally, student free-form comments concerning venue preference were gathered.

There was a statistically significant difference ($p < .05$) in both primary survey questions indicating student preference of classroom venue. Students preferred traditional classrooms in both the numerical-preference Likert scale measurements, and also in percentages of positive versus negative free-form comments. However, none of the nine supporting survey questions on instructional processes showed significant differences between the classroom venues. These supporting questions included instructor use of technology, instructor/student and student-student communications, instructor engagement, course instructions and expectations, average amount of time spent working on the class, and likelihood to recommend the course to others. Though it appears that while students say they prefer the traditional classroom rather than the live

virtual classroom they did not rate the traditional classroom as any different in instructional quality or process from the virtual classroom.

Student free-form comments did specify several positive aspects to traditional classroom venues, including a more personal face-to-face interaction with instructors and fellow students. There were several positive comments about live virtual classes, including flexibility associated with location and a wider range of students. The negative comments about live virtual classrooms centered on frustration with repeated technological glitches and the requirement for instructors to be adept with troubleshooting issues.

Hypothesis 2 was rejected because there was a significant difference in student preference between live virtual classroom and traditional classroom venues. This finding partly supports previous findings concerning transactional distance and student satisfaction, and partly contradicts findings associated with student satisfaction and performance. Moore's (1993) underlying premise was that reducing transactional distance between students and instructors would improve student satisfaction, which in turn would improve the students' overall learning and performance as well as reducing attrition. If live virtual classrooms simulate dialogue, structure, and level of autonomy of the traditional classrooms, it was not clear from student comments that it was sufficient to cause them to prefer live virtual classrooms rather than traditional classrooms. Falloon (2009) observed three significant factors associated with the nature of the transactions between instructors and teachers: dialogue, structure, and autonomy of learners and how they interact with each other. Dialogue pertains to more than simple two-way communication; rather, it refers to all forms of interaction, and must be of good quality

more so than frequency (Falloon, 2009). The secondary survey questions that delved into communications between students and instructors did not show a difference in student perception between the live virtual classroom and the traditional classroom venues.

The secondary survey questions were intended to further identify reasons the students showed a preference in classroom venue. These questions all showed no difference between venues, and therefore, the methods of instructor communications, availability of instructor outside of class, meaningful and timely instructor feedback, instructor classroom engagement, instructor course instructions and grading criteria, and overall impression of the instructor were all determined to not be factors in the venue of student preference. Furthermore, students expressed similar time commitments to the class, and indicated no significant differences in likelihood in recommending the courses (both venues) to others.

These findings support recommendations by Maguire (2009), Cross (2012), and Mashaw (2012) which posited that student interaction and participation is more than simple discussion or writing. Rather, this communication must include engaging activities that combine technologies that allows the instructor to give students direct, timely input, with ease of communication between both the instructor and the student group of peers (Cross, 2012). Since instructor and student interactions appear not to be different between the two study groups, other causes of discontent must be determined. Dabaj (2011) noted that the different methods of communications in distance learning might require a more detailed investigation. The preferred student venue might need to be investigated by isolating some other aspects of student-instructor or student-student

interaction and communication to help identify what factors influenced the preferred student venue of traditional classroom (Dabaj, 2011).

Mashaw (2012) also noted that at the top of the list of student frustrations is the communication gap created by technical frustration and stress. The major national-level university student end-of-course survey instrument did not offer the students the ability to directly rate technology support. However, student free-form comments did identify several areas of discontent—one of which was technical glitches in multiple classes during the course. Thus, one possibility for student preference of traditional classroom supports Mashaw's (2012) observation about technical frustrations.

The relationship between the findings for Hypothesis 1 and Hypothesis 2 is not consistent with the previous findings of performance linked with satisfaction. Martin and Downey (2009) and Radovan (2011) connected student motivation to achievement and performance, with motivation being influenced by satisfaction. The question is, if students were not as satisfied with the live virtual classroom as the traditional classroom, why were the grades not different as well? Further evaluation of the survey possibly answers that question. The primary survey questions highlight a student preference for classroom, although not necessarily an absolute level of satisfaction. Therefore, while students still prefer one venue rather than another, this simple preference may be insufficient to warrant the stronger reactions associated with dissatisfaction (higher attrition, poor recommendations to potential students, etc.), which would explain the deviation from predicted performance versus student satisfaction. Another explanation might be that students at the graduate level of study might be motivated by factors less

influenced by classroom venue preference because interaction with other students and instructors in not as important to more seasoned and experienced students.

Research Question 3: "What difference exists, if any, in the level of student attrition rate between live virtual classrooms and traditional classroom venues of instruction?"

$H3_0$. There is no difference in the level of student attrition between live virtual classrooms and traditional classrooms after controlling for age, GPA, gender, and socioeconomic status.

There were only three dropouts of the original 138 students enrolled in the courses in the study: two students from two separate live virtual classes and one student from a traditional class. None of the classes with these students had the same instructors, and the students were not included in the surveys because they withdrew prior to release of the surveys. While the attrition rate of live virtual students was higher as compared to traditional students, the numbers were insufficient to demonstrate a statistical significance. There were no other differentiating relationships or patterns to be gleaned out of this limited withdrawal rate.

Hypothesis 3 was not rejected because there were no significant differences in attrition rates between students in live virtual classes versus traditional classes. The lack of difference of attrition between the live virtual classroom and the traditional classroom venue is consistent with Moore's (1993) transactional distance theory if the transactional distances are similar. Both the traditional classroom and the live virtual classroom employ synchronous learning methodology, and as such, dialogue and social interaction are increased to replicate those same interactions in a traditional classroom (McBrien et

al., 2009). It is also consistent with Martin et al. (2012), who found the integration of synchronous communications in online courses improved the sense of immediacy, socio-emotional interaction, and student engagement.

One possibility is that students in this study, while preferring the traditional classroom rather than the live virtual classroom, were not sufficiently disenfranchised with the live virtual classroom venue to withdraw. The more mature and experienced graduate students in this study might not value immediate instructor and student interaction as much as a less experienced student. Student motivation because of other factors might explain why the students were not sufficiently unhappy with the identified technology issues to discontinue the course of study. This motivation could be limited selections or opportunities equivalent to the major nation-level university (no competition). Another option for the motivation to continue could be the simple inertia associated with staying in a current curriculum rather than moving to a new institution with the attendant fees, processes of enrollment, and credit for pervious work.

The small attrition rate for both groups might also be the result of the small sample size, and thus a much larger sample might give a different outcome. The other consideration is the major national-level university's definition of withdrawal. If data were collected to include all student withdrawals, the results might capture more students who had a strong preference of one classroom venue over the other. Ultimately, the recommendation for gathering this information is to evaluate the expense of investing and maintaining live virtual technology along with the potential increase in prospective students against the continued expense of maintaining the number of traditional classrooms with a stable (and potentially decreasing) current student population.

The significance of this study is based on the gap in literature specified in the first chapter, which stated the need for studies to focus on the student outcomes (as expressed by student performance, student satisfaction, and student attrition rate) in live virtual class venues. University student populations are increasingly drawing from non-collocated students who have traditionally not had much choice other than asynchronous, web-browser based online learning infrastructure. This research adds to the body of knowledge to change the perception of distance learning to now include student outcomes from distance synchronous classroom formats that take advantage of substantial computer and communications technology improvements (live virtual classrooms).

Recommendations

Recommendations based on results of the study. This research indicates there is no difference in the graduate student performance or attrition rate between live virtual classrooms versus traditional classrooms at this major national-level university. Both student performance and student attrition rate had some confounding factors that cannot be dismissed. Student performance was measured only by grades. The study only compared differences between the same classes taught by the same teachers but with different venues, which made the comparison limited in sample size. Further limiting the grade sample size were the requirements that qualifying students must have taken two courses in both venues to minimize differences from lack of familiarity. This requirement reduced the sample size by almost half, resulting in the necessary addition of a fifth course to make the sample size sufficient for analysis. While justified to meet sample size restrictions, this introduced even more variability into student performance numbers.

Another potential confounding factor was the course designs were not studied. While the grades were based upon work, including tests, that were different between the different classes in the study, the evaluations of learning for the particular course may not necessarily truly measure student performance as a result of the improved student interactions as a result of transactional distance. Some classes and their graded assignments might be more individually oriented in nature, and not dependent upon student interaction to achieve adequate representative scores. The standardization of scores within like courses did keep the comparisons the same per course, but an independent assessment of student performance outside of the classroom by a third party might provide more discriminating results concerning student performance rather than simply assigned grades.

The attrition data was very limited due to a low dropout rate in both venues, and thus could not be analyzed to glean additional information. Attrition data could be improved by a larger sample size. Also, if attrition were measured from the beginning of the course term, rather than one week into the course, the withdrawal numbers might be higher and sufficient to conduct additional analysis on attrition. More data needs to be gathered from students who withdraw. They should be given full surveys to provide the university with better understanding for the reasons for withdrawal. Of particular note in this study would be a query concerning whether or not classroom venue was a reason for withdrawal or not. Other factors to assist in the gather of data on attrition might include apportioning some part of the survey towards student intent to withdraw. Students could be asked if they ever considered withdrawing from the course, and if so, did the reasons include classroom venue. Students could also be asked on the survey how many times

during the course did they consider withdrawing.

The major national-level university students preferred the traditional classroom venue as compared to a live virtual classroom venue. There were no consistent factors identified in the study of the secondary survey questions that indicated why the primary survey questions showed this student preference. Student free-form comments did identify both positive and negative aspects to live virtual classrooms. The positives included flexibility in location and breadth of student population while the negatives revolved around technological glitches as an irritant with the live virtual classroom. Primarily, the comments simply reflected a preference due to factors not quantifiable or readily expressed by the standard survey instrument—the students liked traditional classrooms as a simple matter of preference. It is possible this preference has to do with the relative newness of live virtual classrooms with current graduate students, as compared to familiarity with the traditional classroom venue beginning at a young age.

From the university's leadership perspective, this preference does not translate into an increase in attrition, or a difference in student recommendations to others—both of which would be a negative financial incentive if true—but they were not. Student performance was also the same between the two classroom venues in the study. Therefore, while the student preference might be sufficiently different to identify on a survey, this is potentially the result of the trivial reason of familiarity. The university should evaluate this simple preference against the financial realities of the declining traditional student population, and the need to recruit students from non-traditional locations. To be able to increase the target student population, such as the graduate student level associated with the major national-level university in the study, is a

tremendous financial incentive with little apparent downside.

This study identifies some other underlying factors. The reason for the student preference of traditional classroom venue needs further investigation. The current survey at the major national-level university is very limited in scope, partly because the student identifying factors are removed before the survey is administered, and the questions prevent much identifying data (age, GPA, gender, socioeconomic status for instance), which would be of use in narrowing populations features for study. The survey itself also does little to identify specific reasons for student satisfaction or dissatisfaction, and needs substantial refinement to support more in-depth studies of the students' opinion. Also, because identifying data are stripped prior to the actual execution of the survey, investigators could make no performance correlations. Differences in classes, instructors, and overall quality of product are limited by this relatively arbitrary and simplistic data gathering methodology.

The major national-level university's institutional research office justifies this decision based upon the absolute requirement of student anonymity. There are two immediate issues of concern with this justification. First, in today's day and age of electronic evidence, few people truly accept the notion of complete anonymity. It is not uncommon to see teachers addressed by name in some of the free-form comment sections, indicating that students expect instructors to read the critiques and likely have a name available if they search with sufficient effort. However, even accepting the notion that students believe this promise, anonymity should be guaranteed vis-à-vis the release of information from the research branch of the school, not at the gathering stage. The school's institutional research is severely limited by this restriction in data gathering

mode, which outweighs the perceived altruistic benefit of absolute student anonymity, that students may not believe exists anyway.

As an immediate suggestion, at the very least, the surveys should add substantially more questions designed to gather some fundamental characteristics of the population, including age, gender, and socioeconomic status. While a new process would invariably take time to develop, the promise of anonymity could be carried out through properly authorized release and use of the data, rather than as a prerequisite of the data collection. While this methodology might increase risk of data anonymity breach, the benefits outweigh the risks, when it comes to providing university leadership an in-depth level of analysis based upon survey data. As it stands right now, the data is limited in value, and not used extensively by university leadership.

Higher education institutions should also take advantage of the findings that student performance as well as attrition rate are not affected by this change in synchronous classroom methodology. There is a responsibility associated with providing adequate technological support, which is neither trivial nor cheap. Certainly, while student satisfaction surveys indicate a preference for the traditional classroom venue, the financial implications of a much wider student population appears to outweigh a simple preference that is not backed by other data (reduced revenues in the form of higher attrition or negative student recommendations). Because of the economies of combined instructional staff, higher student to instructor ratio, and leveraging technology to diversify the student classroom population, university leadership should instead focus on the different methods available to offer this relatively new live virtual classroom technology with the greatest student satisfaction.

The design and content of these synchronous classroom courses requires experience, and a skill set that goes beyond traditional instructor capabilities (Sinkovics et al., 2009). It also requires a robust technical support staff at both the transmitting location and the remote sites. Technologically perceptive students have little tolerance for glitches and apparent ineptitude when they show up for classes expecting seamless content, as witnessed by strong comments in the free-form survey results. This information should include, if applicable, the recognition that live virtual classes can become technologically unwieldy if they become too large (Maguire, 2009). While the temptation might exist to expand class population substantially beyond current practice, the possibility of technology issues makes the larger student population feel even more disenfranchised and removed from a traditional class. Thus, the simple preference of traditional classroom could migrate sufficiently with technology issues to create a major dissatisfaction that might result in negative changes in student enrollment behavior.

With the student outcomes of performance and attrition being the same, the primary recommendation is for the university to address the outcome of student satisfaction. There were two primary themes gleaned from the current student survey results. First, the current survey identifies items that do not appear to be different in student satisfaction, so therefore the survey must be redeveloped to include areas not previously considered, with questions targeting different aspects of student populations, needs, and motivations. The surveys should also include identifying information tailored towards developing more sophisticated statistical analyses and multi-tiered relationships designed to identify student motivations for preferences in classroom venue.

Secondly, student commentary was particularly negative and focused concerning

technological issues with the live virtual classroom. As discussed, the live virtual classroom involves computer hardware and software, a robust broadband Internet connection, display technology, and interactive methods between the groups. This entire process represents a complex interaction between those groups of advanced technology. The final piece of this venue is a level of comprehension and technical savvy on the part of all users—the students, the instructors, and the professional technical support staff.

Technology implementation has two components (Buschor et al., 2012). The first is long-term investment and planning for a capability desired and defined by the user. The recent improvements in all the live virtual enabling technologies supporting user needs with capability-based hardware and software are ever improving. Like all technology implementations, at some point, the decision about capability versus desired outcome must be stabilized for implementation. After the basic capability is demonstrated to the user's satisfaction, the technology can be fully deployed. This entire process occurs in a technology stasis of sorts—while the surrounding technology continues to evolve. Thus, a measured program of improvements and implementation of technology add-ons must be carefully crafted and designed into the basic system otherwise it becomes obsolete almost at implementation.

The second portion of a technology-based solution involves instructor and institution response to problems associated with the technology—in this case the live virtual classroom hardware, software, and communications suites (Mashaw, 2012). Therefore, technical support must be equally broad-based—the problem could be a software issue, a computer hardware issue, a broadband connection issue, or any combination both at the instructor and student levels. Each instructor and student likely

has hardware systems and variations of software that are not exactly the same (Buschor et al., 2012). This individual hardware and software configuration practice is unlikely to change based upon the expectations of modern students with differing computer systems. Based upon the student comments of problems occurring during class, this on-the-fly capability also mandates a requirement to have support technicians available at the same times as the classes are conducted. The resultant broad-based technical support availability and expertise requirement is not trivial. Therefore, the required commitment for technical support represents a major effort and expense on the part of the major national-level university, and will provide little room for error before students develop strong negative feelings towards the implementation of live virtual technology over the more comfortable and familiar traditional classroom.

Recommendations for future research. Although the number of participants in this survey is adequate for the analyses that needed to be performed, a larger number of participants could be more helpful in drawing generalizable conclusions for colleges and universities in developing classroom venue plans, especially those that involve deployment of complex technology, specific and targeted training of individuals, and setup plans for technology support. Second, the current major national-level university survey process needs an overhaul. As it stands right now, the survey data is likely unused by the university leadership, since the findings are of limited value for advanced statistical analysis. A true quality product-oriented survey should be aimed at identifying groups dissatisfied with various aspects of the university experience to conduct a methodical process of improvement through a well thought out, targeted, and robust survey process. These current surveys offer no such opportunity for university

leadership. As such, the conclusions drawn from the surveys are limited in value and substance.

It is recognized that the problems within one particular college or university may be unique, and the problems identified in this particular context may not necessarily apply to other colleges and universities. The level of student maturity and degree-seeking level may result in different outcomes. This study was only done at the graduate level, and only at a single major national-level university offering both live virtual classrooms and traditional classrooms. It is therefore recommended that studies be conducted in three different forms. First, a similar study can be replicated at different colleges and universities throughout the U.S. that offer similar methods of study. Doing so can identify the classroom venue challenges unique to a particular college or university. Second, a study may be conducted to include students at different levels of study. As student background reflects societal adaptation to the advanced computer and communications suite trends, student acceptance of live virtual technologies will most likely evolve. This concept of student acceptance of new technologies will best be captured as students progress in education—potentially reaching back to students in primary schools, secondary schools, and undergraduate studies. Third, other studies may be conducted to compare and contrast the marketing strategy problems associated with reallocation of school campus assets from a number of small, remote campuses that have their own small teaching staffs, to larger, regional campuses that have satellite operations supported by only live virtual classrooms. This third grouping of studies could identify both common and unique issues associated with different geographical locations and regional demands. Marketing personnel might devise specific marketing venues for their

unique needs as well as create a broad action plan to address common issues affecting the recruitment of students who previously thought advanced college education was not available at any location except a traditional classroom college location.

The limited sample size, limited survey response rate, and number of courses available to study might also be a reason for the inability to draw definitive conclusions regarding the reason for student preference of the traditional classroom venue. Certainly, there was limited data available for evaluation of attrition. Future researchers might want to focus on this aspect of the topic to provide proof that is more empirical for some of the researchers' interpretations of the results of the student free-form comments in the survey. In particular, the measurement of student attrition could be accomplished immediately after the class starts rather than after the first week. Students who withdraw could be surveyed in the same manner as those who completed the course with a robust survey process to identify many things, including reasons for withdrawal and specifically issues with classroom venue. All students could be given detailed survey questions that include considerations to withdraw throughout the term, and for what reason. The number of times the student gave strong consideration to withdrawing can also be measured via survey. Qualitative method studies might be appropriate to glean more information from individuals who have withdrawn, or from those who strongly considered withdrawing, compared with those who did not.

New methods for evaluating student performance could be a good method to gain more insight rather than just using grades as a single measure. A specific course design study prior to measurement could identify different types of courses that students take (i.e., interactive versus not interactive), and create baseline tests for students to take

throughout the course, and at the end. Some courses lend themselves to project development and student interaction, while others focus more on individual learning and thus individual performance. Limited student performance assessment to the graduate level of study could be eliminated, with broad categories established for comparison. For instance, a major study could include student performance and grades from students in various levels of study such as high school or undergraduate studies. Also, finding other schools using similar live virtual classroom setups might prove valuable in the comparison process.

There is a limited amount of research focusing on the reason students prefer traditional classrooms beyond purely personal preference, which is most likely due to familiarity. Better interaction between students, and between students and instructors, to improve the virtual classroom remains the primary recommendation for future research. Additional studies could improve the understanding of how universities can encourage and support technological advancements associated with improved live virtual classroom venues. Improved virtual classrooms would allow the university to maximize the potential increase in student enrollments from previously inaccessible populations, which would be helpful in designing effective marketing campaigns and improve university higher learning marketing programs for prospective students. Specifically, from this research, the following recommendations for further research are presented.

Colleges may develop partnerships with high schools and undergraduate schools to expose more students to live virtual classrooms and the complex technologies involved in successful course presentation. A college-preparatory program can be developed for prospective students to fully understand the content and structure of live virtual courses at

the college or university level. Ultimately, students will be more confident in participating in these classes because they are more familiar with the structure and methodology of the courses. In addition, if live virtual classroom technology is introduced at the high school level, it is easier for students to be confident because they would have similar experiences from high school once attending college or a university. Such a program will also draw students to colleges and universities that were previously too remote and distant to support scholarly activity with an institution of higher learning. Future researchers are advised to conduct an experimental correlational test to examine whether college-preparatory programs have an effect on the student satisfaction with live virtual classroom venues.

It would be helpful to evaluate the different styles of live virtual classrooms that are evolving. The new generation of college students (first undergraduate, but increasingly graduate students) will be fluent in technology applications that include advanced hardware, software, and communications suites oriented to scholarly interaction and activities. Accordingly, the young adults will be well informed with the structure of the courses and be more interested in taking actions. There will potentially be live virtual classes that take advantage of the exponential increase in all technologies associated with live virtual classrooms. These opportunities might include two full classrooms—one with a live teacher in the class, and the other a projected image of the teacher on a whiteboard while giving the lecture. Alternatively, the live virtual course may be held in an otherwise traditional classroom of students, with the instructor in a different location teaching with the suite of live virtual tools. Yet another variation is that each person (student and instructor) might use their own computer, and participate in a

synchronous fashion with the rest of the class even though not geographically collocated. New research is needed to quantitatively and qualitatively evaluate information supporting these new variations of live virtual synchronous classroom instruction as they become available.

Future researchers are advised to conduct a survey on different live virtual methods suitable for the target population. In this case, the future researcher might conduct a study on what instruments are more appealing to the future graduate students: that is, undergraduate students, and even high school students. With this information, prospective students will be more informed about the opportunities these sorts of live virtual classrooms offer, which can lead to pursuing a program of study not previously thought possible due to lack of local facilities for advanced learning.

In addition, a qualitative study may assist in knowing what strategies are effective in satisfying students' critique of live virtual classrooms. A qualitative study is advised because the respondents will not be limited to the options given in a multiple-choice survey. An open-ended face-to-face interview will help researchers explain what strategies can efficiently reach the target population and inform them regarding the live virtual courses available in different colleges and universities. Future researchers may also conduct studies that can examine the effect of having more varied courses of study as part of their curriculum. This empirical study can help the educational institutions introduce appropriate regionally targeted courses. Institution leadership can develop an appropriate and more enlightened classroom venue infrastructure to expand the prospective student population seeking advanced education.

Conclusions

The problem examined in this quantitative study is the significantly higher dropout rates of students in distance learning classrooms as compared to traditional classrooms. Previously, most distance learning has been asynchronous in nature. With recent hardware, software, and communications suite improvements, there exists potential for synchronous instruction and live classroom interaction to remote students via a live virtual classroom. The live virtual classroom provides a venue for those students who prefer a synchronous learning experience with the associated immediate instructor/student and student-student immediate interactions. The specific problem is whether student satisfaction as expressed in dropout rate can be reduced to a level equivalent to a traditional classroom. The results of this study were used to determine that there is a student preference for traditional classroom over live virtual classroom venue. No significant differences were determined in student performance or attrition rate. There were no student satisfaction data indicating reasons for this preference. Last, amplifying free-form comments from the survey identified dissatisfaction caused by distractions associated with live virtual technology glitches during classes. Therefore, it can be concluded that there were some differences in student satisfaction of traditional classroom venue versus live virtual classroom, but that satisfaction was not translated into performance differences or differences in attrition rate. From this study, the virtual live classroom appeared to function equally well as the traditional classroom when measured by grades, satisfaction, and attrition.

Chapter 5 contains a synopsis of this study's implications, recommendations, and conclusions. Practical implications were drawn from the quantitative analyses conducted, along with amplifying qualitative information gleaned from student free-from comments in the survey instrument. Furthermore, this chapter contains recommendations for actual practice and future studies. The results of this study, although not conclusive in every aspect, contribute to the distance learning aspects of the theory of transactional distance presented by Moore (1993) and findings of Moore and Kearsley (1996), Baker (2010), and Kruger-Ross and Waters (2013).

References

Abdous, M., & Yen, C. (2010). A predictive study of learner satisfaction and outcomes in face-to-face, satellite broadcast, and live video-streaming learning environments. *The Internet and Higher Education*, *13*, 248-257. doi:10.1016/j.iheduc.2010.04.005

Ahmad, I. & Bokhari, M.U. (2011). Distance education: from asynchronous to synchronous e-learning. *CPMR-IJT, 1*(1), 8-16. Retrieved from www.cpmr.org.in

Akhras, C. (2012). Virtual classrooms and the discussion forum: A net benefit for business students. *International Journal of Business & Social Science*, *3*(11), 1-7. Retrieved from http://www.editlib.org

Al-Shalchi, O.N. (2009). The effectiveness and development of online discussions. *MERLOT Journal of Online Learning and Teaching, 5*(1), 104-108. Retrieved from http://jolt.merlot.org

Allen, I., & Seaman, J. (2007). Changing the landscape: More institutions pursue online offerings. *On the Horizon, 15*, 130-138. doi:10.1108/10748120710825013

Allen, I., & Seaman, J. (2011). *Going the distance: Online education in the United States, 2011*. Retrieved from http://www.onlinelearningsurvey.com

Allen, I., Seaman, J., Lederman, D., & Jaschik, S. (2012). *Conflicted: Faculty and online education, 2012.* Retrieved from http://www.insidehighered.com

Ali, A. Ramay, M., & Shahzad, M. (2011). Key factors for determining students' satisfaction in distance learning courses: A study of Allama Iqbal Open University. *Turkish Online Journal of Distance Education, 12*(2). Retrieved from http://tojde.anadolu.edu.tr/tojde42/articles/article_8.htm

Andrews, K. (2010). Comparing the quality and effectiveness of asynchronous discussions versus synchronous discussions in an ADL environment. In I. Roceanu. (Eds.), *Advanced Distributed Learning in Education and Training Transformation*. Paper presented at Proceedings of the 6th International Scientific Conference: eLearning and Software for Education, Bucharest. Retrieved from http://www.ceeol.com

Andrews, T. & Tynan, B. (2012). Distance learners: Connected, mobile and resourceful individuals. *Australasian Journal of Educational Technology, 28*(4), 565-579. Retrieved from www.ascilite.org.au

Angelino, L.M. & Natvig, D. (2009). A conceptual model for engagement of the online learner. *The Journal of Educators Online, 6*(1), 1-19. Retrieved from eric.ed.gov/?id=EJ904059

Baker, C. (2010). The impact of instructor immediacy and presence for online student affective learning, cognition, and motivation. *The Journal of Educators Online, 7*(1), 1-30. Retrieved from http://www.thejeo.com

Battalio, J. (2007). Interaction online: A reevaluation. *The Quarterly Review of Distance Education, 8*, 339-352. Retrieved from http://www.infoagepub.com/Quarterly-Review-of-Distance-Education.html

Baxter, J. (2012). Who am I and what keeps me going? Profiling the distance learning student in higher education. *International Review of Research in Open and Distance Learning, 13*(4), 107-129. Retrieved from http://www.irrodl.org

Bernard, R.M., Abram, P.C., Lou, Y., Borokhovski, E., Wade, A., & Wozney, L. (2004). How does distance education compare with classroom instruction? A meta-analysis of the empirical literature. *Review of Educational Research, 74*(3), 379–439. doi:10.3102/00346543074003379

Benson, R. & Samarawickrema, G. (2009). Addressing the context of e-learning: using transactional distance theory to inform design. *Distance Education, 30*(1), 5-21. Retrieved from tccl.rit.albany.edu/knilt/images/d/d2/BensonArticle.pdf

Born, D., Phillips, A., & Trainor, T. (2012). America's service academies, your service academies. *Liberal Education*, 98(1), 46-51. Retrieved from http://www.aacu.org

Boston, W.E., Ice, P., & Gibson, A.M. (2011). Comprehensive assessment of student retention in online learning environments. *Online Journal of Distance Learning Administration, 4*(1). Retrieved from http://www.westga.edu

Bradley, P. (2011). Here today, gone tomorrow. *Community College Week, 23*(20), 6-8. Retrieved from http://www.ccweek.com

Buche, M. W., Davis, L. R., & Vician, C. (2012). Does technology acceptance affect e-learning in a non-technology-intensive course? *Journal of Information Systems Education, 23*(1), 41-50. Retrieved from http://www.jise.appstate.edu

Buglear, J. (2009). Logging in and dropping out: Exploring student non-completion in higher education using electronic footprint analysis. *Journal of Further & Higher Education, 33*(4), 381-393.

Burgess, J.R.D. & Russell, J.E.A. (2003). The effectiveness of distance learning initiatives in organizations. *Journal of Vocational Behavior, 63*(2), 289–303. Retrieved from http://www.qou.edu/arabic/researchProgram/distanceLearning/effectivenessDistance.pdf

Burgess, J.V. (2006). *Transactional distance theory and student satisfaction with web-based distance learning courses.* (Doctoral dissertation). Retrieved from http://uwf.edu/vburgess/Final_Dissertation.pdf

Chen, P., Gonyea, R., & Kuh, G. (2008). Learning at a distance: Engaged or not? *Innovate: Journal of Online Education, 4*(3). Retrieved from cpr.iub.edu/uploads/Learning_at_a_Distance.pdf

Chernish, W., DeFranco, A., Lindner, J., & Dooley, K. (2009). Does it matter? Analyzing the results of three different learning delivery methods. In A. Orellana, T. L. Huggins, & M. Simonson (Eds.), *The perfect online course: Best practices for designing and teaching* (pp. 23-35). Charlotte, NC: Information Age Publishing, Inc.

Coleman, M. (2009, October 5). Colleges kissing tradition good-bye, sign of the times. More schools are offering online courses to attract students. *Florida Times Union*, A1. Retrieved from http://jacksonville.com

Cross, D. S. (2012). *Comparison of marketing techniques to enroll females at a major aeronautical university.* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. UMI No. 3536023).

Creswell, J. W., & Plano Clark, V. L. (2007). *Designing and conducting mixed methods research.* Thousand Oaks, CA: Sage.

Creswell, J. W., & Plano Clark, V. L. (2008). *The mixed methods reader.* Thousand Oaks, CA: Sage.

Dabaj, F. (2011). Analysis of communication barriers to distance education: A review study. *Online Journal of Communication and Media Technologies, 1*(1), 1-15. Retrieved from www.ojcmt.net/articles/11/111.pdf

Dadigamuwa, P., & Senanayake, S. (2012). Motivating factors that affect enrolment and student performance in an ODL engineering program. *International Review of Research in Open and Distance Learning, 13*(1), 238-249. Retrieved from http://www.eric.ed.gov

DeRue, D., Nahrgang, J., Hollenback, J., & Workman, K. (2012). A quasi-experimental study of after-event reviews and leadership development. *Journal of Applied Psychology, 97*(5), 997-1015. Retrieved from http://psycnet.apa.org doi:10.1037/a0028244

Ellingson, D.A. & Notbohm, M. (2012). Synchronous distance education: Using web-conferencing in an MBA accounting course. *American Journal of Business Education, 5*(5), 555-562. Retrieved from http://cluteonline.com/journals/index.php/AJBE/article/viewFile/7212/7282

Falloon, G. (2011). Making the connection: Moore's theory of transactional distance and its relevance to the use of a virtual classroom in postgraduate online teacher education. *Journal of Research on Technology in Education, 43*(3), 187-209. Retrieved from http://www.eric.ed.gov

Ferguson, J., & Tryjankowski, A. M. (2009). Online versus face-to-face learning: Looking at modes of instruction in Master's-level courses. *Journal of Further and Higher Education, 33*, 219-228. doi:10.1080/03098770903026149

Fetzner, M. (2013). What do unsuccessful online students want us to know? *Journal of Asynchronous Learning Networks*, *17*(1), 13. Retrieved from http://www.EBSCOhost.com

Filimban, G. Z. (2008). *Factors that contribute to the effectiveness of online learning technology at Oregon State University* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database. (UMI No. 3308568).

Garrett, C. (2011). Defining, detecting, and promoting student engagement in college learning environments. *Transformative Dialogues: Teaching & Learning Journal*, *5*(2), 1-12. Retrieved from http://www.EBSCOhost.com

Gascoigne, C. & Parnell, J. (2014). Comparing enrollment and persistence rates in hybrid and traditional post-secondary French. *Online Journal of Distance Learning Administration, 17*(1). Retrieved from http://www.westga.edu/~distance/ojdla/spring171/gascoigne_parnell171.html

Gil-Jaurena, I. (2014). Student support services in open and distance education. *Open Praxis, 6*(1), 3-4. Retrieved from openpraxis.org/index.php/OpenPraxis/article/download/111/pdf

Giossos, Y., Koutsouba, M., Lionarakis, A., & Skavantzos, K. (2009). *Reconsidering Moore's transactional distance theory.* Retrieved from http://www.eurodl.org/?article=374

Goel, L., Zhang, P., & Templeton M. (2012). Transactional distance revisited: Bridging face and empirical validity. *Computers in Human Behavior*, *28*, 1122-1129. doi:10.1016/j.chb.2012.01.020

Gorsky, P., & Caspi, A. (2005). A critical analysis of transactional distance theory. Spring 2005. *Quarterly Review of Distance Education*, *6*(1), 1-85. Retrieved from http://www.infoagepub.com

Gorsky, P., & Caspi, A. (2009). Theory of instructional dialog: A new paradigm of distance education. In *25th Annual conference on distance teaching and learning*. Retrieved from http://www.uwex.edu

Green, T., Alejandro, J., & Brown, A.H. (2009). The retention of experienced faculty in online distance education programs: Understanding factors that impact their involvement. *The International Review of Research in Open and Distance Learning, 10*(3). Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/683/1279

Guri-Rosenblit, S. (2005). 'Distance education' and 'e-learning': Not the same thing. *Higher Education, 49*(4), 467-493. doi:10.1007/s10734-004-0040-0

Hart, C. (2012). Factors associated with student persistence in an online program of study: A review of the literature. *Journal of Interactive Online Learning, 11*(1), 19-42. Retrieved from www.ncolr.org/jiol

Hartnett, M., St. George, A., & Dron, J. (2011). Examining motivation in online distance learning environments: Complex, multifaceted, and situation-dependent. *International Review of Research in Open & Distance Learning, 12*(6), 20-37. Retrieved from http://www.eric.ed.gov

Hays, N. L. (2008). *An analysis of selected professors' perceptions and concerns regarding online distance education* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 33328195)

Hermans, C., Haytko, D., & Mott-Stenerson, B. (2009). Student satisfaction in web-enhanced learning environments. *Journal of Instructional Pedagogies, Volume 1*, 1-19. Retrieved from aabri.com/manuscripts/09147.pdf

Hintze, J. (2013). NCSS 9, LLC. Kaysville, Utah, USA. www.ncss.com

Holmberg-Wright, K., & Wright, D. (2012). MBA and undergraduate business student perceptions of online courses: Experienced online students versus students who have not taken an online course. *Global Education Journal, 1*, 169-186. Retrieved from http://www.franklinpublishing.net

Hrastinski, S. (2008). A study of asynchronous and synchronous e-learning methods discovered that each supports different purposes. *EDUCAUSE Quarterly, 31*(4), 51-55. Retrieved from http://net.educause.edu/ir/library/pdf/eqm0848.pdf

Kaminski, K., Switzer, J., & Gloeckner, G. (2009). Workforce readiness: A study of university students' fluency with information technology. *Computers & Education, 53*(2), 228-233. doi:10.1016/j.compedu.2009.01.017

Kim, D.S., Lee, H., & Skellenger, A. (2012). Comparison of Level of Satisfaction between Distance Education and On-campus Programs. Journal of Visual Impairment & Blindness, 106(5), 275-286. Retrieved from http://scholarworks.wmich.edu

King, F.B., Young, M.F., Drivere-Richmond, K., & Schrader, P.G. (2001). Defining distance learning and distance education. Retrieved from www.editlib.org/p/17786/article_17786.pdf

Kotsiantis, S.B., Pierrakeas, C.J., & Pintelas, P.E. (2003). Preventing Student Dropout in Distance Learning Using Machine Learning Techniques. In V. Palade, R.J. Howlett, and L.C. Jain (Eds.), *Knowledge-Based Intelligent Information and Engineering Systems*. doi:10.1007/978-3-540-45226-3_37

Kruger-Ross, M., & Waters, R. (2012). Predicting online learning success: Applying the situational theory of publics to the virtual classroom. *Computers & Education, 61*, 176-184. doi:10.1016/j.compedu.2012.09.015

Kuo, Y., Walker, A., Belland, B., & Schroder, K. (2013). A predictive study of student satisfaction in online education programs. *The International Review of Research in Open and Distance Learning*, *14*(1). Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/1338/2416

Kyger, J. W. (2008). *A study of synchronous and asynchronous learning environments in an online course and their effect on retention rates* (Doctoral dissertation). Retrieved from Dissertations & Theses: Full Text database. (Publication No. AAT 3363962)

Lavolette, E., Venable, M. A., Gose, E., & Huang, E. (2010). Comparing synchronous virtual classrooms: Student, instructor and course designer perspectives. *Techtrends: Linking Research And Practice To Improve Learning*, *54*(5), 54-61. doi:10.1007/s11528-010-0437-9

Levy, Y. (2004). Comparing dropouts and persistence in e-learning courses. *Computers & Education, 48*(2), 185-204. doi:10.1016/j.compedu.2004.12.004

Lewis, M. (2011). Moving into the live virtual classroom. *T+D*, *65*(7), 76-77. Retrieved from http://www.astd.org/TD/

Lindsley, D., Brass, D., & Thomas, J. (1995). Efficacy-performing spirals: A multilevel perspective. *Academy Of Management Review*, *20*(3), 645-678. doi:10.5465/AMR.1995.9508080333

Mabrouk, S.L. (2011). Student engagement in online courses. Paper presented at Proceedings of Twenty-third Annual International Conference on Technology in Collegiate Mathematics, Denver, Colorado. Retrieved from archives.math.utk.edu/ICTCM/VOL23/M013/paper.pdf

Mackey, K., & Freberb, D. (2010). The effect of social presence on affective and cognitive learning in an international engineering course taught via distance learning. *Journal of Engineering Education, 99*(1), 23-34. doi:10.1002/j.2168-9830.2010.tb01039.x

Maguire, L. (2009). The faculty perspective regarding their role in distance education policy making. *Online Journal of Distance Learning Administration, 7*(1). Retrieved from www.westga.edu

Martin, A. J., & Downey, M. (2009). Interpersonal relationships, motivation, engagement and achievement: Yields for theory, current issues, and educational practices. *Review of Education Research, 79,* 327-365. doi:10.3102/0034654308325583.

Martin, F., Parker, M., & Deale, F. (2012). Examining interactivity in synchronous virtual classrooms. *International Review of Research in Open & Distance Learning, 13*(3), 227-261. Retrieved from http://www.eric.ed.gov

Mashaw, B. (2012). A model for measuring effectiveness of an online course. *Decision Sciences Journal of Innovative Education, 10*(2), 189-221. doi:10.1111/j.1540-4609.2011.00340.x

McBrien, J., Jones, P., & Cheng, R. (2009). Virtual spaces: Employing a synchronous online classroom to facilitate student engagement in online learning. *International Review of Research in Open and Distance Learning, 10*(3), 1-17. Retrieved from http://www.eric.ed.gov

McKerlich, R., Riis, M., Anderson, T., & Eastman, B. (2011). Student perceptions of teaching presence, social presence, and cognitive presence in a virtual world. *MERLOT Journal of Online Learning and Teaching, 7*(3), 324-336. Retrieved from jolt.merlot.org/

Minner, D., Levy, A., & Century, J. (2010). Inquiry-Based Science Instruction—What Is It and Does It Matter? Results from a Research Synthesis Years 1984 to 2002. *Journal of Research in Science Teaching,* 47 (4), 474-496.

Mohammad, S. & El Masri, A.A. (2012). Factors affecting dropouts students in Arab open university - Bahrain branch. *International Journal of Science and Technology, 2*(7), 435-442. Retrieved from ejournalofsciences.org/archive/vol2no7/vol2no7_6.pdf

Moore, M. G. (1993). Theory of transactional distance. In D. Keegan (Ed.), *Theoretical perspectives of distance education* (pp. 22-38). London, UK: Routledge.

Moore, M.G., & Kearsley, G. (1996). *Distance education: A systems review.* Belmont, CA: Wadsworth Publishing Company.

Murphy, E., Rodriguez-Manzanares, M., & Barbour, M. (2011). Asynchronous and synchronous online teaching: Perspectives of Canadian high school distance education teachers. *British Journal of Educational Technology, 42*(4), 583-591. doi:10.1111/j.1467-8535.2010.01112.x

National Institutes of Health. (1979). *The Belmont report: Ethical principles and guidelines for the protection of human subjects of research.* Washington, DC: U.S. Government Printing Office.

Naylor, L. A., & Wilson, L. A. (2009). Staying connected: MPA student perceptions of transactional presence. *Journal of Public Affairs Education, 15*(3), 317-331. Retrieved from http://www.naspaa.org

Nichols, M. (2011). Intervention for retention through distance education: A comparison study. Retrieved from http://akoaotearoa.ac.nz/download/ng/file/group-5/intervention-for-retention-through-distance-education-a-comparison-study.pdf

Oztok, M., Zingaro, D., Brett, C., and Hewitt, J. (2012). Exploring asynchronous and synchronous tool use in online courses. *Computers & Education, 60*(1), 87-94. doi:10.1016/j.compedu.2012.08.007

Park, J. & Choi, H.J. (2009). Factors influencing adult learners' decision to drop out or persist in online learning. *Educational Technology & Society, 12* (4), 207–217. Retrieved from http://www.ifets.info/journals/12_4/18.pdf

Patti, P. A. (2010). *The invisible classroom: Learning style and learner satisfaction in a virtual, audioconferenced technical training environment* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database. (UMI No. 3398693)

Quigley, K. (2014). *Impact of post-traumatic stress symptoms on college self-efficacy and student engagement among military members returning from deployment* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database. UMI No. 3633211).

Rabe-Hemp, C., Woollen, S., & Humiston, G. (2009). A comparative analysis of student engagement, learning, and satisfaction in lecture hall and online learning settings. Summer 2009. *Quarterly Review of Distance Education*, *10*(2), 207-252. Retrieved from http://www.infoagepub.com

Radovan, M. (2011). The relation between distance students' motivation, their use of learning strategies, and academic success. *Turkish Online Journal of Educational Technology*, *10*(1), 216-222. Retrieved from http://www.tojet.net

Ramos, J.A. & Borte, B. (2012). Graduate student stress and coping strategies in distance versus traditional education. *Asian Journal of Distance Education*, *10*(1), 52-60. Retrieved from www.asianjde.org/2012v10.1.Ramos.pdf

Rist, L. R. (2008). *A peer assessment of academic quality in online learning: A state college 10-year academic accreditation review* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database. (UMI No. 3350696)

Saba, F. (2012). A systems approach to the future of distance education in colleges and universities: Research, development, and implementation. *Continuing Higher Education Review, Volume 76,* 30-37. Retrieved from distance-educator.com/wp-content/uploads/Saba.pdf

Scharf, G. C. Jr. (1966). *The counselor selection scale: Design for an experimental test* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database. (UMI No. 302210554).

Scharf, J. C. (1987). *The effects of cool-white and full-spectrum lighting on normal and once-hyperactive adults* (master's thesis). Retrieved from Worldcat (OCLC No. 84261763).

Shadish, W., Cook, T., & Campbell, D. (2002). Experimental and quasi-experimental designs for generalized causal inference. Boston, MA: Houghton Mifflin.

Shearer, R.L. (2009). Transactional distance and dialogue in online learning. Paper presented as part of the 26th Annual Conference on Distance Teaching & Learning. Retrieved from http://www.uwex.edu/disted/conference/Resource_library/proceedings/29897_10.pdf

Shin, N. (2003). Transactional presence as a critical predictor of success in distance learning. *Distance Education, 24,* 69-86. doi:10.1080/01587910303048

Smith, M. (2004). Is it the sample size of the sample as a fraction of the population that matters? *Journal of Statistical Education. 12*(2). Retrieved from http://www.amstat.org

Sinkovics, R., Haghirian, P., & Yu, S. (2009). Information technology-based innovation in international marketing education: An exploration of two learning environments. *Journal of Teaching in International Business, 20,* 123-148. doi:10.1080/08975930902827841

Street, H. (2010). Factors influencing a learner's decision to drop-out or persist in higher education distance learning. *Online Journal of Distance Learning Administration, 13*(4). Retrieved from http://www.westga.edu

Sullivan, T., & Freishtat, R. (2013). Extending learning beyond the classroom: Graduate student experiences of online discussions in a hybrid course. *Journal of Continuing Higher Education, 61*(1), 12-22. doi:10.1080/07377363.2013.758555

Szathmary, K. J. (2014). *Airline service quality: Investigating the relationship between customer satisfaction and airline performance* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database. (UMI No. 3636734).

Touchette, M. (2014). Satellite Airman Leadership School. *Big Sky Flyer*, *36*(6), 5-6. Retrieved from www.120fw.ang.af.mil/shared/media/document/AFD-140530-012.pdf

Tu, C., Blocher, M., & Gallagher, L. (2010). Asynchronous network discussions as organizational scaffold learning: Threaded vs. flat-structured discussion boards. *Journal of Educational Technology Development & Exchange, 3*(1), 43-56. Retrieved from http://www.sicet.org

Wilson, D. & Allen, D. (2011). Success rates of online versus traditional college students. *Research in Higher Education Journal, Volume 14.* Retrieved from http://www.aabri.com/rhej.html

Wingreen, S.C. & Moorman, M.O. (2011). An assessment of the reasons for non-completion in online learning programs. *International Journal of Instructional Technology & Distance Learning, 8*(12), 3-16. Retrieved from http://www.itdl.org/Journal/Dec_11/Dec_11.pdf

Xenos, M., Pierrakeas, C., & Pintelas, P. (2002). A survey on student dropout rates and dropout causes concerning the students in the course of informatics of the Hellenic Open University. *Computers & Education, 39*(4), 361-377. doi: http://dx.doi.org/10.1016/S0360-1315(02)00072-6

Yuen, K., Lee, S., & Tang, E. (2011). Reasons for dropping out in distance learning. *International Journal of Continuing Education & Lifelong Learning*, *3*(2), 25. Retrieved from http://www.EBSCOhost.com

Appendixes

Appendix A:

Permission to Conduct Research

September 30, 2014

Reference: Mark T. Scharf
IRB: 2014-09-30-320

Approval Date: **09/30/14**
Continuing Review Due Date: **08/30/15**
Expiration Date: **09/29/2015**

Dear Dr. Patrick McNamara, Dissertation Chair:

On September 30, 2014, Northcentral University approved Mark's research project entitled, *Comparing Student Cumulative Course Grades, Attrition, and Satisfaction in Traditional and Virtual Classroom Environments.*

As an investigator of human subjects, the student researcher's responsibilities include the following:

1. Report promptly proposed changes in previously approved IRB to your study such as changes to the sampling design, research procedures, consent/assent forms and any other study documents, regardless of how minor the proposed changes might be. (Review the modifications request procedures in the Dissertation Center, under the IRB thread).

2. Report promptly to the IRB any injuries or other unanticipated or adverse events involving risks or harms to human research subjects or others.

3. Report to the IRB the study's closing (i.e., completion of data collection and data analysis). ***Note the above expiration date of the IRB approval.*** It is the researcher's responsibility to report the closing of the study to the IRB before the study's expiration date. (Form is in the Dissertation Center, under the IRB thread).

4. If the study is to continue past the expiration date, student researcher must submit a request for continuing review prior. ***Note the above continuing review due date.*** It is the researcher's responsibility to obtain re-approval

from the IRB before the study's expiration date. (Form is in the Dissertation Center, under the IRB thread).

5. If re-approval for continuing review is not obtained (unless the study has been reported to the IRB as closed) prior to the expiration date, all activities involving human subjects and data analysis must cease immediately

Sincerely,

Dr. Alice Yick
NCU, Associate Director of IRB and IRB Reviewer
Northcentral University

Appendix B:

Survey Questions

SQ1: The instructor used a variety of methods to communicate with the class (e.g., email, announcements, etc.).

Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D), Strongly Disagree (SD).

Weight: SA=5, A=4, N=3, D=2, SD=1

SQ2: The instructor was readily available for questions and assistance outside the classroom.

Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D), Strongly Disagree (SD).

Weight: SA=5, A=4, N=3, D=2, SD=1

SQ3: The instructor provided meaningful and timely feedback on my assignments and progress.

Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D), Strongly Disagree (SD).

Weight: SA=5, A=4, N=3, D=2, SD=1

SQ4: The instructor kept the class actively engaged with the subject matter and each other.

Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D), Strongly Disagree (SD).

Weight: SA=5, A=4, N=3, D=2, SD=1

SQ5: My overall impression of the instructor is positive.

Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D), Strongly Disagree (SD).

Weight: SA=5, A=4, N=3, D=2, SD=1

SQ6: The delivery mode (e.g., Classroom, Online, [Live Virtual], etc.) used in this course was my most preferred delivery mode.

Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D), Strongly Disagree (SD).

Weight: SA=5, A=4, N=3, D=2, SD=1

SQ7: My overall impression of this delivery mode (e.g., Classroom, Online, [Live Virtual], etc.) is positive.

Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D), Strongly Disagree (SD).

Weight: SA=5, A=4, N=3, D=2, SD=1

SQ8: The grading criteria were explicit and easy to understand.

Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D), Strongly Disagree (SD).

Weight: SA=5, A=4, N=3, D=2, SD=1

SQ9: Instructions for course activities and assignments were clear.

Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D), Strongly Disagree (SD).

Weight: SA=5, A=4, N=3, D=2, SD=1

SQ10: The average amount of hours I spend working on this (in and out of class) per week is:

More than 15 hours, 10-14 hours, Approximately 10 hours, 5-10 hours, 0-5 hours.

Weight: >15 hours = 5, 10-14 hours = 4, Approximately 10 hours = 3, 5-10 hours = 2, 0-5 hours=1

SQ11: How likely is it that you'd recommend this course to a fellow student?

Definitely (D), Very Prob (VP), Possibly (P), Probably Not (PN), Very Prob Not (VPN).

Weight: D=5, VP=4, P=3, PN=2, VPN=1

Appendix C:

Survey Comments

Live virtual classroom student comments

- [Live virtual] can be effective, and in my opinion is superior to online classes, but its overall effectiveness is heavily dependent on the instructor and course materials.
- My preferred method is physical classes, which are not available here at [the major national-level university local campus]. However, [live virtual] emulated that environment much better than traditional online.
- I personally did not have any technical issues.
- Sometimes there would be issues and glitches on [live virtual] but for the most part it went smoothly.
- Gave a good forum for student cross talk... allowed students to hear answers to questions that they may not have thought of otherwise.
- I love [live virtual] classes, they're a fantastic concept and I prefer them above any other delivery mode because they still allow me to have face-time with the instructor while being able to spend time with my family.
- I would prefer to have my courses in the classroom but [live virtual] is the very next best thing.
- This was my first [live virtual] course. The experience was great I really enjoyed having a lecture that I could attend from the location of my choosing.
- I love [live virtual]!
- The delivery mode was okay except we had issues with the system several times during the entire course. The sound used to disappear completely sometimes, sounds like

underwater most of the time, it was a whole lot of problems all the time. Hopefully the next class won't have to go through what we went through. If it was not for the instructor who knew how to handle the situation, students would have been really frustrated.

- There was not a single class this term in which we did not have a massive failure with [live virtual]. Multiple times during the class the instructor would have to log off and back in, Excel (the primary tool for the class) would not show when he tried to demonstrate problems. There were also multiple times each class when the audio would fail making it very frustrating and almost impossible to follow.

Traditional classroom student comments

- Classroom is still the best method.
- The utilization of the blackboard and the classroom discussions helped to achieve the objectives thoroughly.
- I enjoyed having a blended class. This was the first one I have ever completed with [the major national-level university]. It gave us a chance to discuss in class and do more research online for the online portion.
- The "blended" delivery mode is an excellent use of both in-class and online time. The online element also helped me get back into the swing of online coursework, as most of the electives here at [the major national-level university] are only available online.
- The blended course is an excellent method of delivery. It provides just the right amount of classroom lecture. I plan to continue taking this option. I do not like or plan to take any online classes. I would highly consider going elsewhere to complete my degree if only online options are available.

- Blended mode is the most effective learning mode [the major national-level university] has used to teach. [Live virtual] classroom from the view of satellite classrooms is inadequate and should no longer be used. (I've attended a number of these). [live virtual] home is ok but not as good as blended.
- Classroom is still the best mode to experience any course I have had during both my undergraduate work and current graduate studies. [The major national-level university local campus] has had the best staff, even some that are currently out of the country have had an impact on my course of direction. Being in a room with these teachers has been a pleasure and learning from them is an honor. I hope to remain friends with my past professors and teachers, not only are they professional they are also great people who work very hard to help those in their class. Interaction and instant feedback is essential for effective instruction.
- [The major national-level university] needs to focus on classroom offerings first, filled in by [live virtual] and online. The blended mode is the best method. I understand economics, but if [the major national-level university] becomes a mostly online institution how is it any different from the [redacted] or other online universities? I am military and understand the need to meet those that need other than classroom offerings. Just don't make that your priority!
- I prefer having a live instructor in the classroom. This class was a blended class, some classroom, some on-line. I enjoyed this format. I understand the constraints of the University and the need to utilize [live virtual classroom], but right now [live virtual] has issues with audio and video cutting out. It is nice having a live instructor to answer questions. I feel the on-line classes stifle the students' from asking questions.

- Material was always on time with great instruction
- The blended class is my preferred method of instruction as a working professional. I cannot see doing a solid lecture block of 5 hours being feasible for someone who has a day job or a family.
- The classroom delivery mode was appropriate for this class.
- Classroom is the way to go for material such as this.
- I like being in the classroom.
- In class is by far my favorite way to learn. Nothing beats the face to face interaction.
- As described above this needs to be a weekly course.
- Classroom delivery mode is preferred however, the weekend format is not. Core courses should be offered on a weekly basis when in the classroom due to content.
- Classroom instruction is by far the most effective instructional method for the students. PLEASE get the core classes especially [redacted] offered in the classroom at [the major national-level university]. I have traveled to [the major national-level university] other campus the last two semesters, but that is a long way to go. I can NOT learn via online or hybrid. I must be in a brick/mortar building in order for me to excel.
- [The major national-level university] should consider continuing with classroom teaching, because you get your money's worth, when you have a human to help you with your problems.
- [The major national-level university computer system] works great!
- good
- Hope they can deliver all class on a classroom mode.

- I am one of the many students that learn better with a local instructor. Being able to interact with the teacher and class and hear their questions and answers was the best. You cannot get tone or inflection with the printed word, or at least I don't that well.
- I like classroom delivery. In my opinion part of the reason to get an education is to get to know your peers. Peer interaction is missing when courses are taken online. [Online computer interface used by the major national-level university] and chats are not an adequate substitute for real people and real conversation and interaction.
- Need to turn OFF the heat in the classroom. Should not be 92 degrees when we are trying to learn.
- This was classroom with a good deal of teacher interface online also. The feedback from the professor was very timely and precise.