

The Investigation of a Synchronous Engagement System (SES)
to Alleviate Anxiety Among eLearning Students in an MBA Program

by

Farnaz Sharifrazi

A dissertation submitted in partial fulfillment of the requirements
for the degree of Doctor of Philosophy
in
Information Systems

Graduate School of Computer and Information Sciences
Nova Southeastern University

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Farnaz Sharifrazi
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The online course delivery at university settings causes students anxiety and frustration. Students are experiencing apprehension and anxiety in online classes for a variety of reasons. This tension is caused by test taking, miscommunication with instructor, confusion, and a lack of interaction between peers. Students indicated a lack of knowledge of course expectations and not receiving immediate feedback on their activities caused them anxiety in online classes.

This study investigated online students' anxiety and frustration in a Master of Business Administration (MBA) program. The study examined to what extent the use of a synchronous engagement system (SES) as an eLearning tool assisted graduate students with alleviating frustration and stress when attending online classes. The SES was incorporated into the Management (MGT) 608 course for the quasi-experimental design to examine and compare anxiety of students after using the SES as an intervention. The study findings revealed that SES was favorable in alleviating students' frustration and anxiety. Based on the results, the SES helped students with communication and interaction in online learning. Therefore, the students' level of comfort was increased as they participated with their peers and instructor using the appropriate tools that they learned through participation in the current study. The results of the study conveyed changes in student anxiety from the experimental group who used the SES as an intervention. They believed that the SES helped them significantly decrease their frustration and anxiety. The qualitative results of the study revealed that overall students found the SES was beneficial to their learning. They were pleased with receiving the guidance from the videos in order to maintain their focus on learning the content and not be overwhelmed with technology.

The implication of the study involved the importance of the SES whereby students overcame their anxiety while able to communicate more effectively. The result of the study conveyed changes in students' anxiety based on their use of SES. This study filled the gap in the literature by introducing the SES as an intervention to alleviate students' anxiety. It is evident that tools similar to SES should be incorporated into online synchronous chat.

Dedication

This work is dedicated to my husband, Nader, and my daughters, Michelle and René, who have applauded me on my accomplishments and gave me a purpose to continue this journey; without them, life would have been meaningless. It is also dedicated to my parents, Mehdi and Irene who have always believed in me.

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Chapter 1

Introduction

Background

Research has reported that the online course delivery format has caused graduate students frustration and anxiety (Havelka, Beasley, & Broome, 2004; Rabe-Hemp, Woollen, & Humiston, 2009; Sinclaire, Simon, Campbell, & Wilkes, 2010). There are various explanations regarding the reasons behind the issues of student anxiety and frustration, ranging from apprehension, as described by Guri-Rosenblit (2009), to physical symptoms of sweating, feeling nauseous, and actually expressing anger toward the computer (Williams, 2010). Stowell and Bennett (2010) and DeVaney (2010) explained that another reason for students' frustration in an online environment was the difficulty of test taking and studying statistics online.

Fuller, Vician, and Brown (2006) studied computer-mediated communication (CMC) and verified that students experienced anxiety in the online learning environment, which affected their emotional state for learning material presented in the context of curriculum. The study measured computer anxiety, apprehension with the use of computers, and correspondence through e-mail. Students were nervous that they would fail when taking any online classes, which increased their anxiety (Economides & Moridis, 2008). They felt that taking tests and having the computer malfunction would result in failing grades, and they became anxious about their academic performance. This

feeling of failure anxiety is not as evident when students attend face-to-face (FTF) classes where there are opportunities to develop relationships between instructors and students.

FTF classes provide opportunities for students to receive immediate feedback on academic performance and technology assistance from faculty that optimizes positive student learning outcomes (Rabe-Hemp et al., 2009). When students attend FTF classes, they develop personal relationships with their instructors and their peers. These relationships facilitate a collaborative experience. Students in a FTF course have the advantage of receiving immediate feedback from the instructors and members of their cohort within a relationship-building context. This immediate feedback is not evident when students attend online classes (DeLotell, Millam, & Reinhardt, 2010). When students are instructed to collaborate on projects in a FTF setting, they have the advantage of speaking directly to their peers to discuss common interests, problems, or ideas for handling assignments. They can ask questions directly to their instructor, and everyone in the group hears the answer at the same time (Workman, 2011). According to Betts (2009), FTF settings also assisted English as a second language (ESL) students with the comfort of watching someone speak, which enabled them to ask an impromptu question. Since students, especially second language learners, cannot be seen in an online format, they can become uncomfortable (Tsianos et al., 2010; Zhuo, Min, & Yunxia, 2009).

When students attend online course sessions in a virtual environment, initially they may experience anxiety and confusion in terms of physical and emotional discomfort; for example, students may be unfamiliar with an online course structure and eLearning tools and would, therefore, experience anxiety and emotional distress (Baylor

& Rosenberg-Kima, 2006; Zembylas, 2008). Moreover, according to Zembylas (2008), there is the absence of emotional interconnectedness in eLearning, whereas in a FTF class the instructor can observe a student who is confused by noticing subtle movements in body language—for example, gesturing—and in facial expressions, such as frowning and rolling their eyes. Students also can participate collaboratively with their peers in a FTF framework (Rabe-Hemp et al., 2009). The FTF framework enables students to get together for a scheduled period of time to discuss, reflect, and present information.

Problem Statement

There is a movement in universities to provide students with an opportunity to take classes online. Within the last 10 years, there has been an increase in university students enrolling in online courses (Sabin & Higgs, 2007). One of the problems that has been researched during these 10 years encompasses students' frustration and anxiety in participating in the online course delivery. According to Colucci and Koppel (2010), students who are enrolled in online courses are deprived of FTF contact; therefore, they experience stress, anxiety, and loneliness. A prominent finding by Hara and Kling (2000) addressed miscommunication resulting from text chat messages as a problem with online courses because text chat is used as a primary communication tool in the online course format and is limited to typing. This mode of communication is time consuming and hinders student learning if students have difficulty typing responses. This miscommunication may result in students' stress and anxiety, as explained by Hara and Kling, and Hove and Corcoran (2008).

Hara and Kling (2000) also concluded that although students take online classes because they want to learn independently, their solitary environment is a frustration and a

distress in the online format. Consequently, a solitary setting impedes communication between peers and their instructor and is definitely a frustration due to students' expectations of immediate feedback. Further investigation into the research on students' frustration with attending online courses was discussed by Howland and Moore (2002) and Dringus (2001), who can be cited as classic sources. Since the asynchronous learning environment is solitary in nature, the online format does not lend itself to a process of collaboration or to provide immediate feedback on questions, assignments, and course guidelines, which presents a problem with an online asynchronous format. Online courses do not enable students to communicate in a natural format, and tools that are used in online courses are not robust. Students are frustrated, as reported by Dringus, because there is a disconnect in the online course design. In spite of this disconnect, Dringus reported that students function within the course shell in order to maximize the level of learning required for them to achieve successful course completion. Hove and Corcoran (2008) also expressed the need for and the importance of investigating the frustration and anxiety of students in a virtual learning environment (VLE). Their study identified a higher degree of frustration in the VLE when compared to the FTF environment; however, they believed further research was needed and should be conducted rigorously in order to address the reasons behind students' frustrations. Supporting Hara and Kling, Hove and Corcoran's findings reemphasized the problems that students have in online environments, and they specifically reported that a misinterpretation of e-mail messages was a big concern when e-mail was used as a primary communication tool. Students' anxiety in an online course format is also problematic, as reported by Lee and Rha (2009).

Dissertation Goal

The main goal of this study was to investigate to what extent the use of synchronous engagement systems (SES) as an eLearning tool or set of tools assisted graduate students with alleviating frustration and stress when attending online courses. The literature revealed that graduate students have stress and frustration and need tools to alleviate their fears (Fuller et al., 2006; O'Regan, 2003; Williams, 2010). For example, O'Regan's (2003) study indicated that a student was in such physical and emotional turmoil that during her interview for the qualitative study, which O'Regan conducted, the student actually cried because she was agitated and hysterical while answering the questions. The second goal of the study was to understand what other factors could affect online students' anxiety. The second goal also included evaluation of the intervention after the course began, and to address and acknowledge any changes in students' anxiety and satisfaction. Based on the research data gathered from the experimental group, modifications are necessary for the benefit of future dissemination of the SES. In addition, the researcher acknowledged best practices that were evident to assist future students in decreasing their anxiety when attending online classes.

A precourse survey, before the start of the online course, was used to gather baseline data to verify what types of frustration and anxiety exist among students enrolled in online courses. The baseline data for exploration of students' anxiety and frustration in an online course environment were used to elicit general feelings and behaviors in the students' experience when taking online courses. The postcourse survey was designed to elicit responses regarding students' feelings of anxiety and frustration following the course completion. Although the results were not predictive, the study was designed to

assist students with future online courses to overcome their anxiety before and during the course.

The study was conducted at National University, in San Diego, California, with two groups. Each group consisted of a minimum of 30 students, totaling 60 students who attended the online Master of Business Administration (MBA) program at the university. The groups were registered for the same course but were divided into two different online classes. The experimental group participated in an online synchronous format with an intervention of web conferencing with Voice over Internet Protocol (VoIP) tools in the form of an SES. In addition, the intervention included SES that introduced the tools that pertain to students in Elluminate Live software called Class LivePro (CLP). The SES provided step-by-step cursor movements along with narratives about the various features that were designed for students' engagement. The SES training included how to enter the class, web conferencing, applications sharing, white board correspondence, and presentation activities, as well as how students express themselves. The SES also included best practices that are prevalent in helping students overcome their anxiety and frustration while attending online graduate courses. Utilization of the web-conferencing VoIP tools in the form of the SES provided an opportunity for students to interact, collaborate, and participate in critical thinking activities as the impetus for learning and practicing course concepts. The inclusion of the components of the web-conferencing VoIP tools effected positive changes in students' anxiety and frustration while taking online courses in an MBA program. The control group used the university's eCollege asynchronous online course delivery system.

The literature supported the need for a SES intervention as reported by Rydzewski, Eastman, and Bocchi (2010), who verified the necessity of using these tools. These tools were used to cultivate group interaction and interchange of critical thinking ideas to achieve high-quality education for the MBA students. The current study addressed the issues of students' anxiety and frustration through developing appropriate components for web-conferencing VoIP tools. This component was developed in order to provide students with the prospect of successful group projects in the virtual environment for the preparation to compete in global business as suggested by the Rydzewski et al. study.

Research Questions

The following research questions guided the study. They were answered through a quasi-experimental design. The purpose was to investigate the use of SES to decrease students' anxiety in online courses.

1. How and to what extent do students enrolled in online classes experience frustration and anxiety related to their courses?
2. How will web-conferencing VoIP tools and SES affect online students' frustration and anxiety and potentially help overcome students' apprehension toward online courses?
3. What other factors affect online students' frustration and anxiety?
4. What are the best practices for using SES tools and VoIP?

Relevance and Significance of the Study

This study examined reasons behind students' distresses within an online course format and used the SES as an intervention to alleviate anxiety among students; however, the literature did not specify a learning tool to alleviate students' frustration and anxiety. The literature emphasized that students are definitely experiencing anxiety and frustration while attending online courses. Therefore, the study was significant to investigate how effective a set of tools were in overcoming or reducing the frustration and anxiety that students experience in an online course delivery. Investigating the value of technology in the form of the SES as an assisting tool was the goal of this study. Rabe-Hemp et al. (2009) noted that students in an online format need to overcome several barriers, which include their ability to use technology, their frustration, and feelings of isolation that cause anxiety. According to Skylar (2009), the ability to build relationships was not present in an asynchronous online format.

This study is significant because as students enroll in online programs, they may continue to be frustrated and anxious about their participation in an online environment. This frustration, according to Lee and Rha (2009), may be due to the lack of physical presence of an instructor. Another cause of students' anxiety is that the course has requirements for collaboration with their peers, and this requires the use of web-conferencing tools. Even gaining a solid understanding of the course content and material offered in online courses continues to cause frustration and confusion (Hove & Corcoran, 2008). Fuller et al. (2006) concurred that student anxiety in the context of electronic learning (eLearning) affects various modes of CMC. The Fuller et al. study measured computer anxiety, fearfulness of communication through the use of computers, and

fearfulness of written communication through e-mail correspondence. Although their study specified the use of e-mail as a mode of computer communication and they reported the importance of learning a variety of different tools related to communication and computer use, there was still a need to expand their study related to students' fearfulness of computers. Fuller et al. suggested that further research should provide an understanding of how to help students overcome their anxiety. Since Dringus (2001) specified the importance of searching for tools that will empower students in an online environment in order to decrease their frustration and anxiety, as well as their disconnection within online courses, this study was important to identify a more effective solution from the students' perspective.

The results of the students' survey regarding anxiety may help to reinforce the need for a more efficient and effective set of tools or virtual lab training for increasing students' confidence for successful learning in an online format. This significance is supported by Maltby and Mackie (2009), who stressed the importance of how a VLE uses the technology of voice and collaboration between students to assist with monitoring what they call at-risk students in the online course format. Their study also acknowledged the difficulty of reaching these at-risk students because the students did not communicate regularly. They concluded that the disengaged students had an anxiety factor and suggested more research needed to be conducted as to how to reach these disengaged students.

There is significant research by Sinclaire et al. (2010) that discussed students' satisfaction in an online course compared to the FTF environment. Some studies (Calongne, 2002; Sinclaire et al., 2010) compared the students' dissatisfaction with

online course delivery; however, these studies did not mention reasons for students' dissatisfaction related to anxiety and frustration. Consequently, there is gap in the literature associated with students' emotional conditions. Upon further investigation, the literature by Hara and Kling (2000) indicated that there was definitely dissatisfaction and anxiety among students taking online courses. Hara and Kling's case study research specified students' frustration with both technology and course content. Regarding the course content, the frustration resulted from students' reluctance to share their aggravation with the instructor. This aggravation that students experienced was due to their vulnerability as they saw their instructor in a position of power. If students complained, their perception was that they may be criticized. According to Hara and Kling, "We suspect that these difficulties were exacerbated by the weaker social cues of asynchronous text-based communication" (p. 22). Changes in course design and delivery might assist students so that their anxiety and frustration will be decreased.

Barriers and Issues

Several barriers and issues need to be addressed on this topic. Although eLearning has been used in universities since the 1990s in an asynchronous model, the need for students to participate in real time in online courses was not developed. Using VoIP and web conferencing is particularly a new technology with about six to seven years of utilization in eLearning. This is one of the issues, that this topic has not been evaluated in the past. In addition to the infancy of VoIP and web-conferencing technology related to online teaching, faculty development and training in this technology has been a barrier.

Faculty have their fears related to online teaching. Computer usage in higher education for distance learning has been limited for faculty and students since the Internet

is a new medium for content delivery. The barrier is the limitation of faculty-centered versus student-centered education (Qi, Liu, Oliver, Wang, & Zhang, 2009). Another issue has been the limitation of bandwidth usage, which in the past was not sufficient to utilize VoIP and web-conferencing applications. With many Internet service providers (ISP), acquiring a fast Internet connection has become a necessity for students and faculty at homes and offices.

As Abazi, Fetaji, and Fetaji (2009) noted, students appreciate the flexibility of eLearning; however, a barrier to the flexibility is students' lack of time management and understanding of the online course protocol. A recommendation of their study was to institute FTF interactions through web conferencing to acquire maximum interactivity with students. Web conferencing and VoIP are the optimum tools to replicate FTF benefits in a virtual environment that is available in this era.

Assumptions, Limitations, and Delimitations

Assumptions

It was assumed that all the participants' responses were honest and their answers were based on their knowledge of any anxiety they had experienced in attending online classes. It was unspecified that the questions on the survey addressed the specific topic of student anxiety and frustration as indicated. An assumption of this study involved the response rate of the students. It was understood that there would need to be a high rate of student responses in order to draw valid conclusions. It was also understood that the study did not control the conditions that led students to enroll in the MGT 608 class or in the master's degree program from which participants were drawn.

Limitations

This study was limited to online graduate students. The study was specific to training of CLP web-conferencing tools for online students before they started the course. CLP was the only web-conferencing tool available for this study. Although it was estimated that 30 students were enrolled in each class, a total of 27 students in each class participated. Therefore, the number of participants in the classes who chose to partake in the study was limited. Since students were not taking this survey together with the faculty present to proctor, it is unknown whether the online environment affected the students' feedback.

The study was limited to a public nonprofit university setting where the average student's age is 33 years, and students are usually employed and seeking an MBA to advance their careers. Their outlook and work experience may have prepared them for utilizing web conferencing in the past. Another limitation is the expectation from the SES treatment that students should watch the clips on their own time and apply their feedback to the postsurvey.

Delimitations

The study was delimited to two identical online MBA courses: MGT 608—Decision Systems for Managers. This study was delimited to both classes being taught during the same time period in an online format. These courses were taught as follows: one with synchronous chat and the other using eCollege asynchronous course modality. The SES software was designed and developed by this researcher and uploaded onto the YouTube website; it could be executed by students through a link provided to them to

view the videos, which was a delimitation for students from the synchronous experimental group.

Definitions of Terms

Computer-Mediated Communication (CMC)

CMC uses computers as a communication device to link users regardless of the geographic location of the users. Computers enable communication through e-mail, instant messenger, and web conferencing. Without computers and networks, eLearning in its current capacity would not be possible.

Electronic Portfolio (ePortfolio)

Students' educational goals and assignments are compiled digitally. All the students' activities, courses taken, and future schedules are stored in this folder. Each folder could be reviewed by students through their identification and password.

Electronic Work-Integrated Learning (eWIL)

A system that was created in one of Austria's higher education institution that captures all the students' assignments and projects is eWil. This system can be accessed by students as well as various stakeholders, such as government, various industries, other instructors, and maybe the community.

Elluminate Live—Class LivePro (CLP)

CLP is the web-conferencing software that utilizes voice in online classroom format. The software provides the tools that are usually used in a FTF classroom in a virtual environment. The main and valuable feature that structures web conferencing is

VoIP. Since the Internet treats voice as packets, it is economical and practical to build applications to use VoIP in an online environment.

Face-to-Face (FTF)

This term is used to describe the physical classroom at the university campus. Traditional classrooms provide constant FTF interactions among instructor and the students during the course. FTF class collaborations contain visual capabilities to watch body language and gestures as part of the communication among the students and instructor. Online classrooms lack the visual component; therefore, using voice properly is essential to send the correct message among all the participants.

Information Communication Technology (ICT)

Vajargah and Jahani (2009) explained, “Information and communication technologies (ICT) are a diverse set of technological tools and resources used for creating, storing, managing and communication information” (p. 60). These tools are text chat, blogs, voice chat, web conferencing, and e-mail. Educational entities provide various types of ICT to ensure higher learning for students.

Online Course Anxiety

Online learning has been portrayed as less friendly and more remote due to lack of FTF interactions among the instructor and the students (Zembylas, 2008). As a result of this lack of interaction, students feel lonely and helpless, which may result in lack of confidence and frustration with the course (Chartzara, Karagiannidis, & Stamatis, 2010).

Session Initiation Protocol (SIP)

Participation of individuals in web-conferencing VoIP sessions is considered SIP in online technology. King, Hannafor, Kammeral, and Steinbach (2010) noted SIP is widely used to establish connections through audio, video, or text in web conferencing with various interfaces through the Internet.

Spam Over Internet Telephony (SPIT)

All types of advertisers send spam to individuals' e-mail boxes to advertise their products. This push advertising from mail boxes has expanded to send voice or visual advertising to web-conferencing and VoIP participants. Muller and Massoth (2010) described the complexity of filtering SPIT since the content is not available in advance.

Synchronous Engagement Systems (SES)

SES is a set of tools that explain the process of web conferencing and VoIP utilizing CLP chats that train students on how to utilize the tools during the live synchronous voice chat. These tools provide an opportunity for students to learn material using a method that simulates FTF interaction in a VLE. A simulation was used in this study for a cyberspace classroom, which was accessed digitally by all the participants. Students needed to use their student identification number and their password to enter the class.

Web Conferencing and Voice Over Internet Protocol (VoIP)

Synchronous online courses utilize web conferencing and VoIP to replicate the FTF classroom setting in a VLE. VoIP is the main component of communication in this environment. Synchronous meetings are facilitated through web conferencing and VoIP.

Summary

The purpose of this study was to investigate to what extent the use of SES as an eLearning tool or set of tools assisted graduate students with alleviating frustration and stress when attending online courses. Since the literature indicated that the development of online classes has changed the structure of interactions between students and teachers, it became apparent that students experienced anxiety and frustration while attending the online courses. This chapter presented the dichotomy of how students relate to learning course content and interacting with the instructor and their cohorts. The chapter also presented the relevance and significance of the study, as well as barriers and issues, limitations, and delimitations.

Chapter 2

Review of the Literature

The following topics organized the literature review to address the issue of utilizing a web-conferencing Voice over Internet Protocol (VoIP) tool as a method to alleviate students' frustration, anxiety, and confusion for online learning in business education in a university setting. The individual topics presented in this dissertation include a history of distance learning, the use of computers in education, synchronous course delivery utilizing web conferencing VoIP, lack of student support in eLearning, and security and privacy issues in VoIP and web conferencing.

History of Distance Learning

According to Larreamendy-Joerns and Leinhardt (2006), the distance learning that began as extended learning in Germany was the impetus of the vision for the current electronic learning (eLearning) that is in practice today. In 1857 Oxford University and in 1858 Cambridge University formed lecture groups to support their extension programs. Correspondence studies were conducted through universities' extension departments that provided the syllabus, course content, study materials, and the examinations (Portman, 1978). As Larreamendy-Joerns and Leinhardt stated, "We make the connection between the history of distance education and contemporary online education because the visionary promises and concerns that many current educators claim as novel actually

have a past, one whose themes signal both continuities and ruptures” (p. 568). The foundation of correspondence education was established in the 19th century having shaped distance learning in the United States. However, in the middle ages, education was available to anyone who decided to learn, and the English universities became significant for affluent students (Watkins, 1991).

An investigation of correspondence and extension studies supports the premise that creating and extending these types of education models was a difficult path to take. In the United States, during the 19th century, several methods of adult education were structured within various universities’ extended studies programs. Correspondence studies became recognized in academia since the enrollment in some programs proved to attract enormous numbers of students. With their high acceptance and growth, correspondence studies were positioned as accredited pedagogy programs; therefore, involvement of valued educators and trained administrators with a focus on expanding the programs to attract students internationally became the priority (Watkins, 1991). Because of this expansion, the National University Extension Association (NUEA) was formed to serve as the focus group to help administrators collaborate (Eklund, 1976). Gerrity (1976) explained the role of NUEA as advancement toward gaining credibility and a positive image of correspondence education. Guri-Rosenblit (2009) verified the credibility and positive image of distance education by acknowledging that the University of Maryland, University College, is known for having the largest student population in online learning in a public university setting. The increase in the online student population in a private setting is also noted at the University of Phoenix (Guri-Rosenblit, 2009).

Computers in Education

Computers were incorporated into university settings, continuing the trend for advancing technology. University courses extended their classes to include computers in the curriculum in the early 1960s (Molenda, 2008; Newby & Marcoulides, 2008; Qi et al., 2009). These classes were titled Computer Studies and Electronic Data Processing, which later became Information Systems (Newby & Marcoulides, 2008). Newby (2002) explained that the course content involved programming and operating systems. These courses were designed to teach the most technical aspects of information systems. Boud, Dunn, and Hagerty-Hazel (1986) noted that course objectives in teaching computer classes included six specific outcomes: (a) introduce computer hardware, (b) reinforce material taught in the lecture, (c) teach the students the principles of using computers, (d) develop a collaborative relationship between students and faculty, (e) motivate learning in the subject of computers, and (f) teach theories behind the practical application of computers. Although additional objectives are part of computer learning courses, these six items are the main learning outcomes in a computer laboratory structure.

Smyth and Zanetics (2007) explained the movement of computer laboratories into direct classroom instruction. Instead of using computers in a laboratory setting, computers became a teaching tool in most classrooms. Smyth and Zanetics acknowledged the capabilities of technology teaching in a classroom by helping students in a real-time format. This resulted in the instructor sharing Internet-based conferencing for teaching and learning. According to research, Qi et al. (2009) stressed that using computers in classroom practice has been transformative. Several researchers have studied how

Information and Communication Technology (ICT) has broadened university students' learning and expectations. Higher education (HE), according to Dawson, Heathcote, and Poole (2010), also expanded the use of ICT and the effectiveness of improving students' learning through the commercial use of various tools. These tools include information from social networking and ePortfolios to assist students in their learning objectives. Dawson et al. outlined the specific position of ICT as an impetus for future learning, as well as providing the flexibility of tools to assist higher education institutions. This view of student learning and flexibility is supported by Hoque and Alam (2010), who explained that ICT has been used extensively in Western countries, Asia, and Bangladesh to transmit education around the globe. Hoque and Alam reported that "the effective integration of ICT into the educational system is a complex, multifaceted, process that involves not just technology, but also curriculum and pedagogy, institutional readiness, teacher competencies, and long term financing" (p. 100). Whelan (2008) also stressed the importance of using ICT as a benefit to other countries and as an outlying method of communication. Since his study was in the South Pacific, it was apparent that the need for global education training in countries around the world would lead to more education and training.

The practice of using ICT has transferred the teaching and learning process strictly from the professor to a dialectic interaction between the instructor and the student. University students are no longer expecting the instructor to know all the answers, but are relying on the instructor to facilitate the information. This facilitation includes sharing information on websites and up-to-date research for students' assignment completion, learning the latest changes in their field of study, or to improve their own scholarship (Qi

et al., 2009). The facilitation is supported by Lu, Hou, and Huang (2010), who discussed how the university instructors introduced a variety of tools designed through an English audio-video speaking course (EAVSC) in their study to assist students in learning English. Because of the adoption of the ICT tools, students were able to communicate more effectively and became active participants in the course, while the advantage of having a saved video of the students to retrieve information for use at a later time helped the instructors in analyzing student work. Supporting the instructor's position as a facilitator, in Lu et al.'s study, was analogous to previous researchers' implications for using ICT tools as the foundation for building student confidence in attending online courses and giving students more accountability for their own learning.

Faculty must be comfortable using ICT tools and receive training in their use so that students attending an online course format will feel comfortable participating. The importance of training has been shown in the similarities between Whelan's (2008) study and Stensaker, Maassen, Borgan, Oftebro, and Karseth's (2007) study acknowledging the need for ongoing training to familiarize faculty with incorporating the various aspects of ICT to enhance university students' educational experiences. Whether ICT strategies are used in the United States or abroad, some of the same concerns of faculty and university administration are presented. Qi et al. (2009), Stensaker et al., and Whelan emphasized the importance and sometimes lack of training in order for faculty to be more effective in the uses of ICT.

Higher education institutions have been examining the many uses and ways that ICT can change the teaching and learning process (Stensaker et al., 2007). The shift of computers in laboratories to computers in university classes has progressed to the practice

of online teaching where students have an option at universities to attend either FTF teaching on site or classes online. Research from L fstr m and Nevgi (2007) indicated that using a blended curriculum of FTF and online classes helped to structure curriculum so that students had more opportunities in the learning process to collaborate and become more confident of their ICT skills. The blended format prepared universities for changes in helping faculty and students make transitions for more online programs. For example, McCarthy and Murphy (2010) reviewed the concept of blended courses, whereby the university course has combined FTF with an online format. Students attend a particular number of FTF courses and other sessions of the course online. The advantage of this blended approach is to have the students accept more responsibility for their learning. If they are required to be present in an online format, students may structure their time and responsibilities more carefully so they will fulfill both requirements.

An introduction of blended or hybrid courses has initiated a new set of skills; it is apparent that the students still have feelings of anxiety in using an online learning modality. Although computer utilization in the classroom has resulted in the comfort of students' participation in distance learning (Coe Regan & Youn, 2008; Larreamendy-Joerns, 2006; Smyth & Zanetics, 2007), research has indicated that students still have computer anxiety as they use the Internet to navigate research tools (Combes & Anderson, 2006; Fuller et al., 2006; Guri-Rosenblit, 2009; Saade & Kira, 2007; Wilson & Morrison, 1999/2000). Maurer (1994) also reviewed the literature related to computer anxiety and factors that affected the anxiety and frustration of university students when using computers. The factors that make a difference with computer anxiety are age, gender, math anxiety, and negative previous experience with computers, academic

achievement, and personality traits. Maurer concluded that additional research needed to be conducted on computer anxiety because of the inconsistency of his literature review. Maurer stated, “The only conclusion that can be drawn from the existing body of literature is that we do not know what to do about computer anxiety!” (p. 374). Current research (Beckers & Schmidt, 2001; Havelka et al., 2004) verified a continued concern for computer anxiety among university students and viewed the definition of computer anxiety differently. Havelka et al. (2004) defined computer anxiety as computer phobia, similar to Yaghi and Abu-Saba (1998), while research has specified comparable terms that describe computer anxiety. Beckers and Schmidt (2001) have also identified physiological effects of sweaty palms, nervousness, and hyperventilating among students who anticipated using computers.

In their study, Havelka et al. (2004) researched computer anxiety related to social cognitive theory. They theorized that the ability of students to intellectualize information and construct problems to solve would correlate and decrease computer anxiety. If students were willing to take chances and did not have the same physiological effects when working with computers, the question of student comfort would play a role in their ability to overcome computer anxiety. The results of the Havelka et al. research did not show a significant correlation, but concluded that students who took more computer courses or who had more experience with computers had less anxiety. Havelka et al.’s study supported Maurer (1994), who found that gender, age, and personality were related to computer anxiety. Males were more apt to have experience with computers, which equated with a lower anxiety level, while younger students were less anxious. Student personalities contributed to student anxiety. If students were comfortable or relaxed in

their course connect time and assignment submission, they became less anxious about assignments and relating to their peers in an online environment.

Additionally, research conducted by Saade and Kira (2007) found similar results to the Havelka et al. (2004) study. Their study found that the computer's perceived ease of use (PEU) is related to students' anxiety. When students have more experience working with computers, their attitude about computers is more positive. However, according to Saade and Kira, "Frustration, confusion, anger, anxiety, and similar emotional states can affect not only the interaction itself, but also productivity, learning, social relationships and overall wellbeing" (p. 1193). Saade and Kira's definition of computer anxiety was supported by Hsu, Wang, and Chiu's (2009) definition, but added that anxiety can affect a student's future use of computers.

Bradford and Wyatt (2010) conducted a study with online college students and the factors that influenced their class satisfaction. Their study acknowledged the teacher as the facilitator and students' satisfaction was based on students' level of comfort. Also a factor that contributed to students' satisfaction in their study was age and maturity of the college students. Bradford and Wyatt discussed how an online course delivery system contributed to the students' frustration and anxiety, which related to their satisfaction and performance. Although students reported greater flexibility with online learning, they also reported technological problems with Internet connections, which added to their frustration in attending online classes. Hara and Kling (2000) also discussed students' distress as the students had differing levels of computer knowledge and capability to perform their online requirements related to their satisfaction in attending online courses. When students were more comfortable using computer technology, their course

satisfaction increased (Bradford & Wyatt, 2010). In another study, Bates and Khasawneh (2007) reported that students were also able to increase their mastery of the material or course content and curriculum when they had more experience with computer technology.

College Students' Anxiety and Frustration

Research has indicated that college students experience various levels of anxiety and frustration that range from understanding assignments, completing assignments because of excessive course workload, to personal family-related issues (Ong & Cheong, 2009; Ratanasiripong, Sverduk, Hayashino, & Prince, 2010). In addition to anxiety among college students, the literature indicated that college students experienced a great amount of fear of test taking (Economides & Moridis, 2008), fear of statistics (Onwuegbuzie & Wilson, 2003; Williams, 2010), and fear of presentations in a college setting (Elliot & Chong, 2005). These fears can lead students to believe they will fail even though they have the intellectual level to succeed. Economides and Moridis (2008) explained that students' fear, especially on timed tests, can cause the students to question their abilities and lack the preparation to study. This fear related to time, as a factor for taking tests, can be more pronounced in an online class format. There have been numerous articles on students' fear of statistics. Onwuegbuzie and Wilson (2003) and Williams (2010) published articles pertaining to college students' fear and anxiety of statistics. Both researchers indicated that females had a high anxiety level and did poorly on statistics tests. This coincides with Onwuegbuzie and Seaman's (1995) study, which compared two groups of female students taking several statistics examinations. The women were divided into time-limited and time-unlimited groups. The results of the

study indicated that whether or not time was a factor in taking a statistics exam, the females were highly anxious. The study showed that highly anxious females performed better in untimed tests, but there did not seem to be a difference in time for females with a low level of anxiety. The recommendation from the study was that that timed tests may assist anxious females with improving their statistics exam scores, but not change their attitude of anxiety toward the subject of statistics. However, attitude change may contribute to lessening student anxiety when the instructor's response time increases. For example, the Williams (2010) study investigated the immediacy of instructors or professors responding to students in a statistics course and the instructors' expressed passion for statistics. Her study recognized the importance of immediate response by the instructor as a factor in decreasing the student's statistics anxiety. Williams's study found that when an instructor responded in a timely manner, students had less fear of the instructor and there was a decrease in their feelings of anxiety.

In addition to an instructor's timely response to students' communication, Ratanasiripong et al. (2010) tested a biofeedback program to help students alleviate stress levels, whereas Ong and Cheong's (2009) study classified the type of stress and characteristics of stress foreign-born college students experienced at a private college, with an effort to identify stress management techniques. Additionally, Depaolo, Sherwood, and Robinson (2009) conducted a study that investigated enjoyment and anxiety in relation to college assignments and whether their assignments were related to their cognitive style of learning. Their study indicated that cognitive learning was significantly correlated to their level of anxiety. When assignments were unstructured, students were more innovative and less anxious. Students whose cognitive style was

more structured experienced more anxiety. Depaolo et al. suggested that instructors provide several approaches to completing assignments so that those approaches would match students' learning styles and they would experience less anxiety. Students answered a questionnaire on general anxiety and stress levels that college students encounter, which may have the same effect on students in online classes. Therefore, discussing general studies that seek solutions to anxiety levels of college students may assist in verifying the problems related to college students' anxiety and identify solutions that might be helpful to reducing online students' anxiety.

Another study conducted by Smith and Caputi (2001) recognized thought processes of college students as they reflected or interacted with a computer. When students were anxious about using computers, their cognition or use of thoughts were negative. They perceived themselves as unworthy and doubted their skills. Students found themselves uninterested in the material and there was an interference of their cognitive skills. Matsumura and Hann (2004) used Smith and Caputi's study to reinforce their own analysis of computer anxiety. Although the goal of their study was different, Matsumura and Hann reported that students with a high level of anxiety would choose to avoid computers. Conversely, students with low levels of computer anxiety chose to use computers. Their study identified the choice, to use or avoid the use of computers, was based on a level of comfort. Students' level of comfort was evident in receiving instructor feedback. If students were more comfortable using the computer, they submitted their assignment online for the instructor's feedback. If students had a high level of computer anxiety, they preferred to submit their assignment FTF. One of the solutions to student anxiety related to Matsumura and Hann's study is multiple forms of instructor feedback.

If students have options of receiving feedback they may become less anxious in using computers for their work. Supporting solutions to college students' anxiety, the Ratanasiripong et al. (2010) study examined the effects of biofeedback as a strategy to assist college students with decreasing their anxiety level, regardless of the circumstances responsible for the cause of students' anxiety. Their study connected several biofeedback processes to test students' stress levels. Although the study did not specify the number of students, the results verified a decrease in students' anxiety. The biofeedback was a portable device so students could take the machine with them and monitor the change in their stress level. The study showed students how positive emotions are related to student focus and better memory as reported from the biofeedback machine. The study reported a decrease in students' stress levels.

In addition to biofeedback for identifying anxiety and stress among college students, satisfaction was also researched. Weinstein and Laverghetta (2009) studied the relationship between a college student's satisfaction with life experiences and his or her level of stress. Using a questionnaire they found a negative correlation between students' satisfaction and students' stress level. Students who experienced a greater stress and anxiety level were less satisfied with their lives. Weinstein and Laverghetta's study was conducted to advise college counselors and help them assist students in staying in college.

Students' Anxiety and Frustration in an Online Course Format

Current research continues to acknowledge students' anxiety and frustration, while they are attending online programs (Fuller et al., 2006). O'Regan (2003) indicated that the impetus for students' frustration is their emotional reaction to learning online.

Whether the students were frustrated or anxious, they shared their need to have their professors give them immediate feedback. Williams's (2010) study results described students' anxiety when their professors or instructors did not respond immediately to their posts or assignments and were similar to O'Regan's study results. The range of emotions was described on a continuum from a puzzling emotion because of some technology difficulties to a physical reaction that included anger, anxiety, or physical shaking because they were expecting a response in a timely manner. The students considered the professors' feedback as time sensitive, while the professor was not considerate of their timeliness. For example, O'Regan (2003) interviewed a student who was so physically distraught that she even cried when she was being interviewed and had considered leaving the program.

Further research included examining anxiety with testing or assessment of content in online courses (Stowell & Bennett, 2010), as well as student anxiety in online statistics courses (DeVaney, 2010). DeVaney (2010) reported that students' anxiety was not only related to their competency in the area of statistics, but their anxiety was directed to no physical contact with their instructor, need for immediate feedback regarding questions completing course assignments, and expectations of the course. Conrad (2002) conducted a study that examined students' anxiety as they began their first online courses. Conrad's similar study to DeVaney's showed that students' anxiety levels were raised if there was any preposting from the instructor or classmates before the beginning of the course. Instead of welcoming the preposting as an introductory mode of decreasing student anxiety, students felt an increase of frustration because they believed that they were behind in the requirements if they saw postings before the class began. Conrad's study

had mixed messages from students since students who had taken other online classes reported less anxiety and frustration when postings were made before class began.

Although preposting brought anxiety to students attending online courses, a specific consideration was evident with business students. Havelka et al.'s (2004) study examined undergraduate business students and the various business disciplines. Other factors of importance, such as experience with computers, how many courses students had taken online, and how comfortable they were using computers, were noted. The factors related to general knowledge and capability with computers was substantiated by Saade and Kira (2007), who examined students' anxiety related to computers in general university classes. There appear to be similarities regarding students' anxiety with computers whether they express their frustration in class or online. Igarria and Parasuraman (1989) studied part-time Master of Business Administration (MBA) business management students to distinguish computer attitudes from computer anxiety. Their research included a measurement of both cognitive and behavioral attitudes, as well as levels of anxiety. They used Callahan's (1981) Likert-scale questions relating to cognitive and behavioral attitudes. His research reported a decrease in computer anxiety if students experience an increase in educational understanding of uses of computers, and an increase in attitudes regarding the familiarity of computers. If students are less anxious about using computers, their attitude changes regarding their abilities to use computers. Igarria and Parasuraman suggested the importance of training for business students to alleviate their anxiety relating to computer use.

Various researchers defined student anxiety and frustration. Recent research by Matsumura and Hann (2004) identified computer anxiety as a physical or psychological

stress related to working with computers and identifying the lack of knowledge with technology. Havelka et al. (2004) concurred and identified students having physiological effects of sweaty palms or physically shaking while working with computers and used that description to define computer anxiety as computer phobia, in an online class format. Igbaria and Parasuraman (1989) defined computer anxiety as “the tendency of individuals to be uneasy, apprehensive, or fearful about current or future use of computers” (p. 375). The terms used by Yaghi and Abu-Saba (1998) were *computer resistance* and *computer aversion* to explain the level of students’ frustration in using computers in education. Smith and Caputi (2001) supported Yaghi and Abu-Saba’s terminology, which was used to describe students’ fear and anxiety of computers. Smith and Caputi’s study found that students who had computer anxiety also showed negative cognitive skills in learning as well as self-concept. Their study showed that students who were anxious about their computer skills lacked the confidence of computer use and they were unable to focus on the course content successfully. Consequently, students’ thinking negatively impacted their cognition and interfered with their task completion. In addition to computer anxiety, Fuller et al. (2006) defined several terms that included e-mail anxiety and communication apprehension. E-mail anxiety was defined as “the fear or apprehension associated with real or anticipated use of a computer via email” (Fuller et al., 2006, p. 104). Communication apprehension was specific to an individual’s oral or written ability to correspond or convey information messages or content.

Defining computer anxiety applied to Callahan’s (1981) mixed-methods investigation, which examined individual behaviors and attitudes of college students. Callahan’s study identified five stages prevalent in his research through his qualitative

interviews. These stages were the impetus of computer anxiety. They included “computer alienation, recognized impact on society, and impact on personal life, computer accommodation, and assimilation of computer knowledge” (p. 98). His study was significant because he not only identified personal attitudes and fears of computers but also acknowledged how the fears of the college students related to a more global view of society in relation to computers. Callahan noted, “Students avoided a risk of failure, by remaining within the boundaries of the familiar” (p. 83). There was also a difference in gender related to computer anxiety, and Callahan recognized the socialization patterns in society that are attributed to distinguishing males from females in their role identification. Females are more anxious about math-related activities and computer-related knowledge than males and need encouragement as well as education and recognition for their abilities.

Fear of computers especially in an online format as explained by Leese (2009) stressed the importance of a blended program as a solution for students’ anxiety and frustration with assignments requiring computer use. Leese explained that the expectations of students were fulfilled because of how the students received guidance from their facilitator. Students formed groups online and resolved conflicts independently. Students received feedback and support from the instructor and felt valued with the decisions they made within their group. Leese’s study reported that student engagement outside of the FTF class format was effective.

Other research that recognized computer anxiety of college students was conducted by Combes and Anderson (2006); Dobbs, Waid, and del Carmen (2009); Lewis and Price (2004); and Stowell and Bennett (2010). Their studies indicated the

prevalence of frustration and anxiety of students who were attending university courses in an online course format. Each of these authors conducted various studies regarding students' perception of their online experiences. Although Dobbs et al. (2009) noted that students appreciated an online course format for the access and flexibility, they also stressed that students expressed problems with an online format regarding a sense of belonging, collaboration with fellow students, and a feeling of isolation. Combes and Anderson's (2006) study found that students' isolation and the lack of interaction in an online course affected their self-confidence. The aspect of self-confidence related to anxiety in an online course format is also supported by Smith and Caputi (2001).

Synchronous Course Delivery

Although the research examined the relationship between computer anxiety and factors related to course format, the course delivery system has an impact on students' behavior and their ease or comfort using computers. In an online learning format, students are unable to have the FTF interaction and dependency that they have in an onsite course delivery (Howland & Moore, 2002). Consequently, according to Howland and Moore (2002), students who engage in an online learning environment should possess attributes of self-direction, self-reflection, and personal motivation in order to succeed. There are several approaches to course delivery within an online context. According to Dede (2003), "Many students reported that the use of synchronous learning environments positively affected their participation in the course and their individual cognitive process for engaging with the material" (p. 8). This was supported by Gallegos Butters (2007), who stressed the changes made in course delivery and acknowledged the need for professors to restructure the way they teach. Since online courses are increasing

at most universities, and there are many more universities that do not have FTF programs, professors need to ensure that they communicate effectively with students online. This change in communication was also stressed in research conducted by Alstete and Beutell (2004) that compared students in an online business management program. Their study noted that students responded positively when the professors communicated in a timely manner. A recent study conducted by Falloon (2011) reiterated the importance of synchronous learning as an interactive platform. Falloon interviewed students who shared their perceptions of interactivity in a distance learning environment. The most important finding was the students' ability to dialogue with the instructor in real time. He wanted to know how real-time experiences related to students' engagement and assisted students' in "breaking down isolation barriers" (Falloon, 2011, p. 192). Students expressed their positive experiences using the Adobe Connect format to communicate. They stressed the nuance of voice inflection and their presence in developing relationships among each other. When they returned to the text chat forum, the students had a better understanding of the question and created a stronger relationship with their fellow students stimulating their motivation for the class work. Students reported that the effectiveness of interactive dialogue helped them. Freire (1970) discussed the importance of how dialogue can be an impactful process for both teaching and learning and that culture is an integral part of successful communication. In a synchronous format for online learning, Freire's concepts surrounding the use of dialogue are vital. Freire discussed the quality of integration between the teacher and the student as they interacted through dialogue.

The use of dialogue as an effective means of learning for international students, however, had mixed reviews as reported by Wang and Reeves (2007). Their study

examined the perspectives of international students from Taiwan relating to online learning within a cultural context, as students experienced a synchronous course delivery in higher education. A consideration of the concept of culture in addition to ethnicity can also be applied to the culture of technology. Their qualitative study interviewed five university students attending an online instructional technology course. Although the students participated in a dialogue with the instructors, there were several issues they presented that were of concern. They seemed to have difficulty expressing themselves through visual means and felt that the facial expressions seen in a FTF course would have helped them understand their instructor's emphasis. From their experience, they did not believe they could build a learning community. Students did not want to be misunderstood because their willingness to speak in an impromptu manner was also a problem. Since English was not their first language, they felt stressed reporting information online. At the same time, they expressed their frustration; they were grateful for the real-time opportunity to speak with their instructor. The other concern students expressed was times of boredom during the online course. They felt the course lacked creativity and they needed a more flexible format. Since there were mixed perspectives, it might be advantageous to develop a classroom format that is structured similar to Löffström and Nevgi's (2007) description of a blended course curriculum. Students would attend classes FTF and receive reinforcement regarding assignments and research using the web or Internet sources during their synchronous sessions. The professor could still institute synchronous chat sessions, but the students would also have the satisfaction of being able to meet with the professor FTF. Wang and Reeves (2007) believed that if students had sessions that included FTF interaction in the course structure, they would

have more reflection time to contemplate the questions asked during synchronized class sessions. This might be similar to an open-book test that is sometimes noted in online course formats. The literature designated this format as hybrid (Baker, 2010; Bigony, 2010; Carson, Cole, Gatzlaff, Maroney, & McCullough, 2010). Baker (2010) defined a hybrid course in accordance with guidelines established by the California State Code of Education as “instruction in which the instructor and students are separated by distance and interact through the assistance of communication technology” (p. 41). According to Garrison and Kanuka (2004), a blended or hybrid course combines the advantages at all levels of the highest quality of learning with the complex structure of course content and the sophistication of creativity from both the instructors and the students regarding the context of information and shared learning experiences.

A hybrid course has many advantages as Carson et al. (2010) noted. One specific advantage for the students is the variation of learning style afforded by the hybrid model. Those students who need an FTF interaction with their instructors can be assured they will have the opportunity to interact, watch their classmates and the professor’s facial expressions, and participate in activities which provide human connectivity during the FTF class time. Online synchronous and asynchronous format provide class flexibility for faculty and student schedules. Allmendinger (2010) explained that the context of learning related to outcomes based on collaboration “focuses on discourse processes, argumentation, mutual explanations, or information exchange processes” (p. 52).

Although the research on hybrid classes is a positive experience, a study conducted by Colucci and Koppel (2010) indicated that some students were not suited for a hybrid model. Colucci and Koppel required the treatment group FTF to attend one more session

than the control group, and the treatment group had more flexibility during FTF meetings. The study did not find a statistically significant difference between the treatment and control group. The researchers believed there were factors that resulted in no significance. The treatment group who attended online course delivery format really wanted a limited amount of FTF meetings, but received more time FTF. The researchers speculated that students were unhappy with additional FTF meetings, which resulted in lower course evaluations. There were also differences in the treatment and control group on specific tasks. The treatment group missed more assignments and their grades were not as high as those of the control group. Therefore, hybrid courses may need more investigation and consideration as a viable means of course delivery. Studies that involved a selection of synchronous chats included in the online course format may be an alternative to the hybrid or blended online course delivery system. If regularly scheduled real-time sessions would assist students with the relationship that is missing in attending FTF courses, it might be a more directed alternative for students' successful outcomes.

Although hybrid courses serve as a link between students and instructors, there was not information of the cultural makeup of the classes. There is a cultural difference in attending online classes as observed in a study in foreign countries. Wang and Reeves's (2007) study identified differences between the students who were American and those of Taiwanese heritage. These differences related not only to ethnicity (culture), but also to the culture of technology. Class participation in the synchronized sessions involved more American participants than Taiwanese. The reason, discussed in the study, related to student attitude. The Taiwanese students looked to their professor as the expert, a sign of respect, and to themselves as learners. The Taiwanese students did not believe they had

the expertise that was recognized from their instructor. Education in the United States focuses on student interaction and collaboration, and U.S. students in class are more comfortable in the real-time atmosphere because they can contribute to the group work. The synchronous format also required students to be more savvy with computer skills because their time was spent using the computer especially in a real-time format. The Taiwanese students were more comfortable in an FTF course delivery where they could physically interact with others, as well as their instructor. The results of the study indicated difficulty to collaborate in the synchronous time frame since projects required some graphic depictions of concepts. It was easier, according to the students, to discuss their collaboration in an FTF format. There are also differences between a synchronous and asynchronous course format even though both are structured for online course delivery. Students may experience some anxiety relating to the instructor, as well as to the course requirements.

Within an asynchronous format, there is gap or lag time in receiving a response from the instructor. However, Dede (2003) noted that synchronous virtual media enabled students to collaborate with their cohort in an asynchronous online setting. Therefore, the synchronous environment clearly provides benefit to student learning.

A gap in lag time using an asynchronous format can result in miscommunication, accelerating student anxiety; however, the major difference with the synchronous format is that real-time facilitates dialogue between students and the instructor. Guri-Rosenblit (2009) discussed the process of dialogue and interactive connectedness by stressing the constructivist theory of learning. This theory explains how students construct their learning from their previous experience and become actively involved in new learning.

Faculty and student interaction become the foundation for student success in an online environment. Consequently, applying Freire's (1970) principles of change and Guri-Rosenblit's constructivist theory to business management courses in an online setting prepares students to participate in an action-oriented environment. The communication in a form of dialogue between faculty and students, and students to students, facilitates change. The constructivist mode of learning in an online environment is supported by Fong and Sims's (2010) example from their project integrating all participants into a learning community using electronic work integrated learning (eWIL) to facilitate courses in an online or distance learning environment in Australia. The curriculum was structured from constructivist principles to include a reflective component and a participatory collaborative approach to the learning process.

Smyth and Zanetics (2007) discussed the expansion of the teaching and learning processes by introducing the effective use of Internet-based video conferencing. Olaniran (2006) noted that computer-mediated communication (CMC) in synchronous format allowed for teaching and learning despite the distance or geographic location. Molenda (2008) also utilized Freire's (1970) theory by stressing the changes in the field of audio-visual communication to create new terms integrating communication and technology into education. Audio-visual technology provides effective feedback for sharing messages. Therefore, there appears to be a strong need for the use of interaction among students using web conferencing, VoIP, and multimedia as part of the content of online learning in order to decrease student anxiety.

This interaction using web-conferencing tools has the tendency for student to be self-motivated and self-directed (Hentea, Shea, & Pennington, 2003). Skylar (2009)

acknowledged the significance of interactivity of students resulting in students' positive evaluation of the online courses that they had attended. This study investigated students' perceptions of their learning in a synchronous course delivery utilizing a virtual laboratory to include VoIP in a web-conferencing environment. An introduction of breakout rooms, application sharing, and a pre-orientation to acquaint students with strategies to decrease frustration in an online environment was examined to bridge the gap between FTF delivery and the asynchronous online course environment.

Web Conferencing and VoIP in Synchronous eLearning Modalities

VoIP has been defined by Biggs (2007) as “digitization, conversion, and compression of recorded voice signals into data packets that are transmitted over Internet Protocol (IP) network (Internet or private network), to be reassembled and converted back at the other end of the network into voice communication” (p. 1). Research by Stephens and Mottet (2008) recognized VoIP as a tool for interaction and used the word interactivity synonymously for VoIP. The emphasis on interactivity was specific between trainers and trainees within a web-conferencing training context (Stephens & Mottet, 2008). Their research indicated that interactivity did not increase learning. However, Allen, Mabry, Bourhis, Tittsworth, and Burrell (2004) noted a difference in their study results when using VoIP, which found an increase in learning due to increased interactivity as a result of using VoIP. Consequently, there is an inconsistency in research results that VoIP may or may not enhance interactivity. Conversely, Molenda (2008) recognized that VoIP was a popular platform for collaborating on projects or information between students and was advantageous in using the web as a medium of communication. The information presented by Molenda may help in the execution of a web-conferencing

VoIP tools to help students and faculty form a more cohesive relationship to decrease student anxiety and frustration in using computers or attending online courses. Specter (2008) substantiated the advantage of using VoIP in a synchronous classroom. The tool was used to promote technological concepts, as well as to increase the level of human interaction and the process of learning. The synergy of human interaction through technology provides an opportunity for acknowledging “behavior, cognition, and emotion” (Specter, 2008, p. 24).

As students enroll in online business courses and face their anxiety and frustration using computers, the presentation of tools for the ease of use can be the impetus to alleviate the stressors that students experience during their courses. These personal traits, related to the human connection between students and faculty of online courses, may assist students to overcome their frustration and anxiety while using computers in an online university course environment. The transformation of online education provides opportunities for faculty and students to teach and learn from each other in a real-time format. This teaching and learning process is evident in both asynchronous and synchronous class format.

Asynchronous and synchronous modalities in eLearning involve introducing and using a web management tool or set of tools as described by Tolentino (2011). She explained that the university instructors in her study helped students learn content through a technology-based experience. The design of the web portal to disseminate learning was viewed in her study as a useful tool for the instructors with high potential for use in teaching students. The web portal was designed for students to enhance their communication skills with instructors and peers through an online format. Another

initiative prominent in an eLearning format was explained by Omar, Kalulu, and Alijani (2011), and this involved teaching faculty how to integrate and incorporate the new skill set of VoIP and other web-conferencing tools that include video conferencing into their online classroom experiences. These tools are also being taught to the instructors because even though eLearning is not a new concept in higher education, faculty does not have the required training, the experience, and the initiatives of proper use of these tools (Omar et al., 2011). Their study found that 86% of the instructors and 36% of the students believed that training in the processes needs to be ongoing. Another concept was presented by Workman (2011), describing an initiative for change that was the establishment of the Centers for Excellence in Teaching and Learning (CETL). In addition to the area of education, business has also embraced VoIP tools for assisting students and faculty in accessing course curriculum.

Betts (2009) addressed eLearning issues in education from a business management perspective. The orientation of the web conferencing VoIP tool can assist both students and faculty with new skills and techniques to overcome their fear in using computers. These components would assist students in successful completion of online courses with a decreased amount of anxiety. The introduction starts with students beginning the session by taking the microphone and providing a short biography of themselves, from their location of connection. This introduction acquaints students with the online learning format to assist in overcoming students' fears while speaking into the microphone. The first step is an orientation for students to learn how to speak and be heard through the headset with a microphone. The second important step of this voice introduction involved the technology expertise of the instructor to check the students'

voice connectivity and ease of utilizing the voice device. Audio Wizard, a helper within the software, facilitates the student with further troubleshooting if it is warranted. Students are introduced to hand signals to assist them with communicating effectively. Various available signs as part of the web application include raising the hand to speak, giving a quick answer to Yes or No by clicking an appropriate sign, and expressing their feelings by choosing a sign of emotion in the form of an icon. The next step in using the web-conferencing VoIP tool is students' introduction to the use of polls in order to answer questions on the fly, using the white board, and sharing applications with the class. Another important feature of the web-conferencing VoIP tool is the recording, which gives students an opportunity to play back the missed class chat. The most important learning tool is students' collaboration with each other as noted by Persico, Pozzi, and Sarti (2010). Students participate in a breakout room that features all tools needed to collaborate on topics in groups of three or four. The outcome of this collaboration is to promote collegiality and decrease students' anxiety and fear of using computers in online courses. Introducing them to the online tools in the first meeting provides empowerment, reduces the feeling of vulnerability, and decreases their anxiety of online courses. These procedural techniques are an important aspect of students' interaction for an exchange of ideas. These tools help students communicate and achieve higher learning concepts advancing them from FTF classroom format.

Betts (2009) stressed the importance of real-time communication with all the advancement and innovative services. Research by Specter (2008) noted the importance of web conferencing, as well as other tools as it relates to effective learning within an

online course format. No longer should students depend on the FTF classroom format for learning.

Although Allen et al. (2004), Betts (2009), and Molenda (2008) recognized the use of web-conferencing VoIP tools as a solution to student anxiety and frustration, the literature documented a few studies that specify how using web-conferencing tools is still a cause of student anxiety and frustration. The studies from de los Arcos, Coleman, and Hampel (2009), and Lang and Costello (2009) identified student apprehension, as well as students' levels of anxiety, which increased because of their pressure to answer the instructor immediately, and pressure from peers because they could not see the person responding could not surmise what responses were needed from them. These studies acknowledged the continued anxiety and frustration using web-conferencing VoIP tools. For example, de los Arcos et al. conducted a qualitative study and interviewed seven students in a Spanish class who were still filled with anxiety and fear even though the synchronous format using VoIP was instituted to alleviate student fears. Students in the study, according to de los Arcos et al., expressed anxiety because they did not want to be "judged by others, or give a wrong answer" (p. 12) and embarrass themselves in front of their peers during a collaborative project. Students discussed their anxiety when they felt pressure to respond immediately to questions they were asked either by their professor or fellow students during synchronized sessions.

The use of web conferencing within the virtual laboratory as a technique to assist students in their fear and anxiety of computers may help them decrease the amount and degree of anxious behaviors. Additionally, Betts (2009) conducted research, supported by Skylar (2009), that concluded that students would rather take online courses with

synchronous web conferencing. Although Rydzewski et al. (2010) conducted a study on MBA students' perception of their online program and the effectiveness and quality of the program content, students still experienced anxiety issues. Bocchi, Eastman, and Swift (2004) also recognized the importance of the quality of the MBA program in an online format. Their study acknowledged that students were concerned about the technology used in the courses and how the technology contributed to their successful content learning. Research by Rydzewski et al. supported these findings related to how technology is used, but included other components, such as availability, program duration, and students' financial obligations. The results of the Rydzewski et al. study indicated that students were more apt to attend an online program, if they believed that the quality of instruction, the program length, and the cost were applicable to their needs. Students perceived that the quality of education met high standards when it included web-conferencing tools.

Molenda (2008) discussed the strategy that improved the online learning programs in a higher education setting. The concepts of constructivism described by Lobler (2006), which have been applied to education curriculum, are now recognized in higher education and in business and in industry entrepreneurship. Guri-Rosenblit (2009) also stressed the constructivists' theory concepts in a business format. These concepts viewed constructivist theory as self-directed application of new knowledge based on previous knowledge. As one example, the constructivist theory has application in the Educational Video Annotation (EVA) platform. The use of an EVA platform, as explained by Wong and Reimann (2009), offers students the opportunity to track collaboration efforts with classmates, make annotations related to projects, and share

materials. This involvement of students through the EVA platform has helped them share their interpretations regarding specific subjects related to the course. Molenda (2008) reiterated the transformation of an online learning platform by sharing concepts of problem-based learning, collaborative learning, and experiential learning as a new educational online learning design. Collaborative problem-based learning is also explained in a study conducted by Wang and Hsu (2008), who examined the Elluminate software and utilized this tool for conducting webinars to examine how graduate students in a technology course can use webinars to facilitate as trainers and promote learning. Students in the study were used as teachers in the study and the teachers became students. Other Elluminate functions used in this study included video broadcasting, audio transmission, polling, and an electronic white board. These features were options for the students who felt comfortable using them. However, the study focused on the learning curve of webinars and web conferencing. Although the study did not examine issues of anxiety, a recommendation related to the results of the study suggested that prior experience from a demo before online classes begin might help reduce students' anxiety levels of using the program. Similar to the responsibilities in Elluminate, from Wang and Hsu's study, Fong and Sims (2010) also identified problems in their study and suggested using constructivist principles for problem solving in an online undergraduate business class. Students were given an opportunity to use real-life problems from their workplace as the impetus for reflective learning in their online business course. The study integrated a problem-posing approach by using an authentic setting that the students were familiar with, but added the components appropriate for collaborative connections with their fellow students and opportunities to dialogue and work outside of the class time. This

included the asynchronous ICT whereby students were engaged to enhance the projects and communication between all parties. The instructors could verify that this interaction was promoting learning outside of the synchronous format. The student interaction was also a reflective process that enabled students' involvement in evaluation of their respective projects.

Web-conferencing practices were examined in a study by Dede (2003). According to Dede, students who are enrolled in online courses need to alter their beliefs, values, and assumptions to embrace the new system that includes VoIP tools in a synchronous course modality. These tools may assist students with the ability to manage their stress levels that lead to a decrease in fear and anxiety of using computers. Olaniran (2006) supported Dede's premise that synchronous or real-time interactive technologies are more conducive to constructivist principles because the evolution of students' learning knowledge depends on their prior knowledge as they learn new practices through web-conferencing tools. The concept of constructivist learning in an online environment involves the aspects and practice of collaboration in the establishment of shared meaning for a problem-posing and problem-solving process (Satwicz & Stevens, 2008).

In addition, web-conferencing tools were examined by Heeler and Hardy (2005), who investigated the development and practices of online courses in a university setting. Their results implied a need for further exploration of web-conferencing software in the classroom. The need for frequency of interaction among students and between students and their instructors should be studied. This would then result in a development of course content curriculum planning to include web conferencing, VoIP tools, and situations that result in decreasing and diminishing students' fears or anxiety in using computers.

Consequently, the result of this development and planning would be reinforced in coaching and mentoring within a business construct (Roberts, 2008).

Lack of Students Support in eLearning

Universities should be able to train and prepare students on how to use synchronous tools, so they do not feel anxious or appear as an outsider in the eLearning class. Based on studies by Canada (2000); DeLotell et al. (2010); and Kaifi, Mujtaba, and Williams (2009), online faculty's lack of skills in utilizing online tools may impact the students' success in an eLearning environment.

eLearning currently encompasses both synchronous and asynchronous course delivery modalities (Bian, 2009). eLearning in an asynchronous model is not the topic that needs to be elaborated upon, since the environment does not call for real-time responses and utilization of major technology. The course environment navigation can be learned by the students in their own time. The method of communication includes threaded discussions and e-mail among participants. However, based on observation, the students in asynchronous courses also need orientation on how to use the system without feeling anxious if they are confused or frustrated in an area, because voice is not utilized. Utilizing asynchronous model courses involve the use of a headset and microphone, white board, application sharing, and other tools that are available for learning in real time. Using these tools in a live chat is usually complicated for students; additional frustration may occur if students have no background or training on how to operate the technology. This will cause students embarrassment and nervousness, which may result in students dropping the course.

Faculty who teach the course have no idea which students know how to use the basics of the system and which students have difficulty using the system. Faculty can randomly call on students to provide feedback. If the students are not familiar with how to turn on their microphone or their voice cannot be heard due to technical problems, those procedures would cause the student anxiety in answering any questions. According to DeLotell et al. (2010), faculty might not be aware of differentiating the level of students' skill sets in an online environment. This shortcoming of awareness may contribute to the lack of students' support in online learning. One of the requirements to succeed in an online education is students' active participation in the class. However, faculty may not promote the collaboration among students in an online class format if they are not acquainted with eLearning software themselves. Collaboration is a vital point of students' engagement and learning in an asynchronous course format (Canada, 2000; DeLotell et al., 2010).

This collaboration between students and their instructor connotes a relationship that is developed over time. Research from Haiyan and Xianhua (2009) stressed the importance of the relationship between the students and instructors in an online format. The need for faculty preparedness, as explained by Wickersham and McElhany (2010), was a factor that assisted the students with consideration and care, while focusing students on becoming more self-directed. Their study outlined several strategies that helped assist faculty with decreasing student stress levels. Immediate feedback to students, introducing multimedia techniques to communicate with students, and the use of humor as a stress reliever were suggestions made in the study.

Some organizations may neglect to prepare faculty on how to utilize web conferencing to deliver a positive learning environment (Beaudoin, Kurtz, & Eden, 2009). In an eLearning setting, faculty should have the preparation to lecture and engage students not only using the software, but also to provide an environment whereby students can collaborate and learn from each other. The process and practice of student and teacher interaction is the norm of teaching and learning online. Social interaction is important in learning and is a significant factor; therefore, time should be allocated for students to collaborate in breakout rooms. In online classes, there is no eye contact and the faculty cannot view the students' gestures in reading their body language; therefore, time should be assigned for students to be able to communicate with each other. In eLearning courses, regardless of whether they are taught in a synchronous or asynchronous format, consideration should be given to design content for students to receive and understand it properly. Sometimes messages should be repeated more than once for students to absorb. Students may need extra support to learn how to use the asynchronous and the synchronous software in order to feel comfortable with the technology. It has been observed that some students need to upload and download their assignments, which may be confusing and as a result their learning does not improve, since they cannot retrieve their assignment with the instructors' feedback (Williams, Morgan, & Cameron, 2011). Sometimes students feel embarrassed to ask questions in the threaded or live discussions, either from fear of being considered unintelligent or displaying weakness in using technology properly.

Universities that provide eLearning should allocate funds for resources in training their faculty and also their students who are teaching and learning through eLearning.

These training sessions should be more involved in a way to teach them how to convert their FTF teaching by utilizing the tools available in web conferencing in order to deliver the best learning, as well as utilizing best practices for faculty. Although the emphasis in the current dissertation is not regarding faculty, the concept of training for both faculty and students may contribute to students' anxiety or frustration. It is important to note that faculty, regardless of teaching subject, should be trained in a real environment applying best practices that include consideration of the students' background with technology. In this arena it is imperative to note the observation by the author that students appreciate live or interactive training on how to use synchronous web-conferencing tools—in this case, CLP. Creating an interactive training environment in which students can learn and practice on their own could facilitate resolution of students' anxiety and elevate students' learning and success.

Security and Privacy in Web Conferencing and VoIP

Telecommunications has changed significantly in the past few years. Internet access has facilitated the evolution of VoIP and as a result, both VoIP home and enterprise users are employing this technology for communication (Kopsidas, Zisiadis, & Tassiulas, 2007). The acceptance of VoIP is due to various features, such as ease of use, multimedia presentation, and video capabilities. Design and development of VoIP have evolved from the Internet telephony system to be utilized with sophisticated web-conferencing applications that provide the most important tool to communicate in the Internet in addition to e-mail and instant text chatting (Zimmermann, 2010). This tool is considered one of the great emerging technologies of this decade (Me & Verdone, 2006; Sherburne & Fitzgerald, 2004). Private organizations and federal governments, whether

large or small, utilize VoIP and web conferencing as a tool for communication with their customers, vendors, and constituents, as well as to conduct meetings with their regional and global employees. With responsibilities placed on people who use VoIP and web-conferencing tools, the aspects of security and privacy must be considered. Security of VoIP is essential for current and future network structure. Alwi and Fan (2010) described the threats as providing eLearning technologies from a server to server and server to every client who uses the Internet network to join the class. As Walsh and Kuhn (2005) noted, “We guard nothing more closely than our words and it is not only as what we say, but it is that someone else will hear it and who that someone else is” (p. 44). Since threats to databases need to be manipulated through various checkpoints, the data are the main consideration by hackers for breaches. However, it is assumed that database protection is in place to also protect the voice. The major threat is during transmission of the voice as eavesdropping and intercepting can happen to jeopardize the security of voice content. However, with incorporating VoIP in web-conferencing sessions, the threat of intercepting the voice changes to stealing important information, experience, and secrets that can be casually interchanged in a meeting.

Considering the security and privacy issues that business and industry face, there needs to be recognition of these issues as people conduct their business (Sudhahar et al., 2010). Organizations use VoIP in a web-conferencing environment that is created with rich media including presentations and video capabilities. Global business environments require constant and real-time communication among their members across the globe. Investing in web-conferencing software is a priority in organizations as a means of communication with their suppliers, retailers, and customers in supply chain management

(SCM). Zimmermann (2010) expanded on utilizing VoIP as a clarification tool to reduce errors and accelerate solutions among business decision makers. Healthcare organizations utilize VoIP to communicate health information. Military and homeland security organizations use the method to communicate information on terrorism for emergency situations. Depending on VoIP to transmit sensitive messages requires a secured and encrypted protocol to protect the sensitive information (Sudhahar et al., 2010).

Understanding these issues, this tool has become a viable communication method to replace telephone conferencing. As a result of the lower pricing and richness of media, in addition to receiving video content, this model of communication is preferred (Gajendra & Sun, 2010). The convenience of using the Internet as a medium for simultaneous voice communication and the ability to use elaboration has put the VoIP application on most personal computers for connecting with colleagues, friends, and families. One of the highly used companies that implemented VoIP into social application is Skype, which has replaced the legacy point-to-point global telephone conversation. The Skype application does not support the tools that are required for eLearning, eClinic, and business application environments, but must consider the same privacy and security issues as in business and industry (Liu, Gomez, & Yen, 2009).

The use of VoIP and web conferencing has extended relationships with many foreign countries and has been instrumental in providing people with solutions to healthcare problems, and educational issues. According to Sudhahar et al. (2010), in some emerging countries, such as India and Sri Lanka, rural areas rely on VoIP and video conferencing to provide healthcare through eClinics to people who do not have immediate access to doctors and hospitals. The web-based collaboration system connects

the patient and the health consultant in a web-conferencing environment, whereby both can view the patient's chart and previous health records. This system is used also to consult with a specialist about the patient's care. In other countries like the United States, patients' health records are confidential and require high security measures, such as encryption, utilized in transferring this information. Whether or not the information is confidential, security and privacy protection should be important aspects in the system design and structure.

Educational entities as well have utilized VoIP and web-conferencing tools to reach their distance learners and have concerns about security and privacy. In the past decade, VoIP became the popular tool for communication among the social Internet, business, and eLearning users at universities (Goetz et al., 2010). Educational institutions have provided their vision in designing a virtual classroom where ICT tools are used to replicate an FTF classroom with optimum teaching tools. Synchronous eLearning module design that uses VoIP in a web-conferencing environment is becoming the mainstream tool for communication in online class meetings. This technology is the closest to filling the gap between FTF classrooms and interaction in distance education. Currently, eLearning institutions are adopting VoIP and web conferencing at a rapid speed since it is considered the most powerful tool for communication in synchronous eLearning (Alwi & Fan, 2010). However, they are cognizant that students in an educational setting need to protect their privacy and words or concepts they share.

Web conferencing in eLearning enables collaborative features, such as application sharing, multimedia and video utilization, joint paper editing, and white board writing. These features are popular among students, since they receive immediate feedback to

their questions, and the features are valuable tools for collaboration (Keromytis, 2010). The urgency for development and implementation of eLearning and VoIP web-conferencing software among educational entities did not allow for thorough security tests and threats before deployment of the software. With the knowledge that the highway to transfer the VoIP conferencing in the online class is the Internet, this should alert the educators and students to the need for security and privacy measures in the online class (Alwi & Fan, 2010).

Web conferencing, for example, was used in the MBA online classes as a communication medium in synchronous chats. Although popular among students and faculty, there is little research that has been conducted to identify intrusions in VoIP conferencing in the classroom environment. The participants from various work backgrounds share their experience, current processes, gains, and losses of their organization in writing and in speaking, which can be exposed to threats, loss, and mishandling of the data and information if the proper security is not in place (Baggs & Wu, 2010). The students' collaboration as part of course assignments is often comprised of proprietary information and knowledge of their professional perspective; therefore, lack of security measures is a threat if the information is exposed. Utilizing the Internet to transfer voice from end-to-end encompasses the security risk toward voice similar to threats which affect text in use, in transfer, and in databases (Nassar, Niccolini, State, & Ewald, 2007). This threat can also be applied to hosting on the Internet.

According to Falk and Fries (2009), there are two types of hosting, the VoIP and web-conferencing software. The system can be hosted in-house behind the firewall with a trunk that facilitates the communication in-house and updates the service providers:

Session Initiation Protocol (SIP) and Session Border Controller (SBC) through Virtual Private Network (VPN). The other method is to connect directly to the third-party multimedia to create SIP to join the proxy server without an in-house interaction or “trunking” as it is noted by Falk and Fries (p. 241). Proxy servers are involved from vendors to facilitate the communication and stability of the VoIP and web-conferencing applications. Therefore, the need for security measures to protect course content and the privacy of interchanges among students to other students and faculty has high importance in choosing the vendor.

To substantiate the need for security measures, Rezac and Voznak (2010) explained that the same threats that imperil text data also threaten VoIP information. The protection that should be applied to text data that are located on secure databases and are behind firewalls should also apply, but not be limited to VoIP. There are few identified forms of threats that can be utilized to abuse the organizational VoIP; these may include exploiting the VoIP network or utilization of SIP. SIP can be created to hack applications or to create social threats for future Spam over Internet Telephony (SPIT). This can be the result of unfastened security protocols in VoIP applications. One of the most important VoIP threats is that individuals can eavesdrop, and can be invited without requiring authentication and then use the invitation as an entrance to the network through the web-conferencing sessions. The guest can enter the room without using a password and check the environment for future private usage, or find a way to enter the organization’s core system, and use it for future advertising. Utilization of SIP later on to send SPIT can easily be abused and represents a higher threat to the network. These invites can be kept by hackers as long as the systems exist if the meeting room is kept

open and not deleted. An acknowledgement of security measures, understanding of the security threats that surround networks, databases, and text documents should be a protective measure applied to VoIP and web conferencing.

Another security measure that needs to be acknowledged is also mandated by the organization that protects university students. The Family Educational Rights and Privacy Act (FERPA) legally make the educational system liable if the students' information is disclosed to anyone, including their parents, if they are over 18 years of age (U.S. Department of Education, 2011). The stress of the need for proper security measures for online classrooms is as eminent as the Health Insurance Portability and Accountability Act (HIPAA) that dictates privacy requirements for healthcare delivery organizations. Branched out from HIPAA is FERPA, which mandates the security of students' educational information.

This law weighs heavily in higher educational systems, since the majority of National University students are working adults in major organizations or in armed services or areas that mandate their words always be kept confidential. Many of students' educational discussions are based on their experiences from their current or previous jobs with different employers that may contain biased viewpoints, which should not leak out. Without proper security measures, web conferencing will become an untrustworthy tool and may not be able to serve in a justified learning environment that includes academic freedom. Information that is usually shared by students in a web-conferencing classroom environment should be considered proprietary and privileged; therefore, efforts should be made to keep it secure from outsiders.

University administration, Information Technology (IT), and faculty are faced with concerns related to security that need to be addressed. According to Voloudakis (2006), security measures for information systems in higher education have been reactive in the past and mostly followed up on security breaches after they had taken place. The culture of being reactive to security incidents has changed to take a proactive position on security issues in academia. Online courses' content have been designed and developed by Subject Matter Experts (SME), reviewed by peers, and passed through high-quality standards in education. However, the security of the content is considered to be provided by the IT department and it is not included in the course design. Before the start of the course, a copy of the predesigned course is uploaded for the class to use. The faculty and students would be adding extra, valuable content and experience from the current or previous employers as part of the collaboration or interchange of knowledge in the course. This exchange of knowledge can be witnessed in the form of writing discussions or voice in a web-conferencing discussion. All the people involved in these online discussions expect at least due care if not due diligence from the university as the frontline representative for the system security and privacy of their words. Liu et al. (2009) described the feeling of privacy as “confidential means, importance of privacy, level of security/secretcy, risk of sharing personal topics and professional embarrassment” (p. 197).

It is imperative that universities and organizations that use online collaboration, VoIP, and web tools apply the necessary security to provide the appropriate privacy to protect the course content, which is utilized during the course. In addition, other valuable feedback from faculty and students might be added as explicit or tacit knowledge. As one

can note, it contains a rich and up-to-date knowledge repository that can be valuable to access by interested parties. Those who may be interested in this type of information might be future students, competitors, eavesdroppers, and those who can sell the information in the Internet black market, such as notes and research papers, and the most profitable of them all, the sale of personal information. This shared information can result in student vulnerability of their information being abused.

Keromytis (2010) noted the vulnerabilities of VoIP, namely that using the Internet network structure for sending voice packets is risk ridden, since Internet network structure and its security is mainly created to protect text and not voice per se. VoIP, in an application format, is fresh and organizations are beginning to utilize the technology; massive threats are not reported. The theft of voice may not yet be as appealing and lucrative as text that contains personal information. However, major threats and vulnerabilities are presented concerning VoIP that are worth investigating:

(a) eavesdropping, (b) traffic and denial of service attack (DoS), (c) services abuse by users, and (d) interception and interruption of services. In addition to eLearning, more executive management in organizations, U.S. forces, and government agencies are utilizing VoIP and web conferencing to discuss confidential issues. Consequently, the concern for data security is an impetus to evaluate and incorporate security enhancement into new network structures for the protection of the VoIP and web-conferencing contents.

VoIP connection begins with individuals, who start a SIP. Creating a SIP does not need any type of device. The first step is to start the SIP that is used to setup the real-time transport protocol (RTP). SIP is an application layer that creates the session, signals, and

maintains and terminates the session. The SIP network's mission is to sustain the end-to-end communication; end-to-end transmit passes through proxy and redirects servers, location servers, and various routers for the packets to reach to the end point (Gupta, & Shmatikov, 2007). Gupta and Shmatikov (2007) described SIP as also a user identifier, since it is based on a special type of Uniform Resource Identifier (URI) that makes it similar to an e-mail address. According to Sengar, Wang, Wijesekera, and Jajodia (2006), VoIP uses multiple protocols to transmit the data delivery by breakdown of the voice into packets and transmission through various routers and networks in order to reach the destination.

To prevent the VoIP from these security breaches, Radmand and Talevski (2010) suggested utilizing VPN and encryption. Major security misfortune takes place while the data are in transit, not when they sit in a database. VPN creates a connection from Layer 2 or Layer 3 of the system. In Layer 2 of VPN, there is a specific privacy method, and the Layer 3 provides high security and users' privacy that is adequate for protecting communication. The option of voice encryption may be another consideration if VPN is not used; however, encryption may reduce the quality of communication. With the specifics of security and privacy as an issue for students to be protected, a need to include security and privacy in research is warranted.

Summary

This literature review presented topics relevant to the development of online learning in a higher education environment. The literature discussed the beginning of how correspondence schools became the foundation for creating an online learning course delivery in universities for the 21st century. With the establishment of a new

course delivery system for higher education institutions, students began to experience some frustration and anxiety, while attending any online course delivery format. The review compared asynchronous and synchronous course formats explaining the needs of the students taking online courses. The literature discussed the necessity to research strategies, such as VoIP and web conferencing that may assist university students with techniques and approaches to alleviate their anxiety, while attending online courses. These studies identified the basis for student frustration, but still seek to problem solve this dilemma. Included in this literature review is a topic related to computer security and how aspects of security in an online course delivery can assist students with reducing and decreasing student anxiety and frustration. Acknowledging the importance of protecting students through adequate security measures in online courses may help students ease their anxiety.

Chapter 3

Methodology

This chapter on methodology includes the research design, the setting, and the description of the participants. This chapter also discusses the development of the synchronous engagement systems (SES) as a tool to help decrease students' anxiety and frustration while attending online programs. The SES is comprised of individual video clips that show students the steps necessary to access and utilize Voice over Internet Protocol (VoIP) and web-conferencing processes. In addition, this chapter explains the method of data collection and analysis. The last part of this chapter presents ethical considerations and security related to students' privacy and confidentiality.

Research Design

The research used a quasi-experimental design. According to Creswell (2008), a quasi-experimental design involves two groups of equal numbers of participants. One group will not participate in the intervention, as Creswell explained. A quasi-experimental design does not include a random sample; therefore, there can be a threat to the results of the study if the presurvey and the postsurvey are not matched or selection preferences control the experiment (Sekeran, 2004). In this study, the survey administration and assigning of numbers to replace students' names by National University's (NU's) Office of Institutional Research and Assessment (OIRA) eliminated

the threats. An advantage to a quasi-experimental design is the ability of the researcher to use existing groups for the study. The decision was made to use a quasi-experimental design since both groups were taking the same course at the same time; it is applicable to use a quasi-experimental design rather than using a true experimental design. Because National University's (NU's) course structure is based on a one-course-per-month format, it would be difficult to find two courses taught at the same time with the same number of students to conduct the study. The study compared the students' anxiety based on various factors that involved eLearning—for example, communication, collaboration, comprehension, and security of their content—in the two styles of eLearning modalities of asynchronous and synchronous format.

The Setting

The context for the study was a university setting. The setting included graduate students attending the Master of Business Administration (MBA) program at NU, located in San Diego, California, at the School of Business and Management (SOBM) with approximately 750 students. NU is accredited by the Western Association of Schools and Colleges (WASC) with campuses all over the states of California and Nevada. Online students at NU come from all over the United States and abroad. The average age of the students who are enrolled in the MBA program is 33. These working adults are employed in various businesses and industries whereby their MBA degrees will be the impetus for advancement in their careers. The MBA program at NU consists of 12 courses that are offered in a monthly format. Students are required to take one course a month to complete their program in one year (S. Case, personal communication, February 13, 2011).

Participants

The study was created to test experiences of anxiety and stress among two groups of graduate students attending online courses in the MBA program at NU. Students were chosen for this quasi-experimental study from two online MGT 608 courses. There were 60 potential participants for this empirical research study from the two online MGT 608 courses. These students are employed in a variety of organizations, including finance, advertising, engineering, information technology, and health care.

Procedures

This study addressed the following research questions:

1. How and to what extent do students enrolled in online classes experience frustration and anxiety related to their courses?
2. How will web-conferencing VoIP tools and SES affect online students' frustration and anxiety and potentially help overcome students' apprehension toward online courses?
3. What other factors affect online students' frustration and anxiety?
4. What are the best practices for using SES and VoIP?

The quasi-experimental study consisted of two groups of students. The asynchronous group, or control group (CG), was taught without any synchronous intervention. The CG received the course content in the eCollege environment that consisted of weekly threaded discussions, reading the content from both the text and the prepared narrative related to the learning outcome in the course, and preparing case study analysis reports as weekly assignments. Their method of communication with each other

and the instructor was through threaded discussions, e-mails, an announcement board, or phone calls. The synchronous course participants, or the experimental group (EG), received their course content in eCollege and also used live synchronous communication through VoIP and web conferencing about four hours per week.

The purpose of using VoIP and web conferencing in one of the courses was to evaluate students' anxiety and stress in each modality. It was important to evaluate the students' stress and satisfaction in both asynchronous and synchronous models. Next, it was imperative to examine which modality was more effective in eliminating anxiety and stress, and promoting learning among students. The goal was to understand and evaluate the reason for students' anxiety and stress in online courses, which might result in understanding the source of anxiety. In addition, enhancing SES to provide step-by-step navigation for the students on how to sign onto the course from NU's portal to eCollege and ClassLive Pro (CLP) tools was examined.

Both groups were given a precourse survey, which was distributed via e-mail, prior to the beginning of class, to identify the students' general level of anxiety and satisfaction with online course delivery (see Appendix A). The questionnaire was designed by the researcher and included modified questions from Crone's study (2008) on students' anxiety related to computer use, explicitly identifying student frustration and anxiety levels. This questionnaire, as a descriptive research model, included questions related to students' frustration, stress, anxiety, and confusion in an online eLearning environment. The survey was evaluated by an expert panel, a group of individuals who appraise survey questions, programs, and projects for the purpose of validity and consolidation (Gall, Gall, & Borg, 1999). For this study, an expert panel that consisted of

three specialists in the field of information systems was formed to assist with evaluating the validity of both the survey instrument and the SES.

The presurvey was sent to students of both the CG and the EG. The presurvey was identical for both groups and identified students' anxiety level in both asynchronous and synchronous classes. The presurvey contained 19 questions, with seven identifying demographic data. The other survey questions consisted of multiple-choice and true-false questions. The questions were geared to identify students' age, gender, level of computer competency, and number of online courses taken, as well as prior experience with web conferencing. Ten questions were created in the form of a Likert scale with five measures of *strongly disagree*, *disagree*, *neutral*, *agree*, and *strongly agree*. In addition, an extra column was added for *not applicable*. The questions were designed to investigate any type of anxiety, frustration, or stress that students were experiencing when they joined eLearning courses. There was also a question on the survey investigating the students' perception of security and privacy of the content that was shared by each student attending the online class. Appendix A displays the presurvey that was administered for both groups.

In addition to the presurvey, the EG received the SES treatment through a link to YouTube, after the completion of the presurvey and prior to the start of the course. Providing SES links to EG students after the presurvey ensured that the treatment did not affect the group's presurvey responses. Students' participation in the SES treatment introduced them to features and practices of the various components, such as application sharing, the white board, use of polling, and other tools that are pertinent to students' experience in the online synchronous course format. An SES product introduced the

needed tools for online collaboration that included best practices using synchronous voice chat. SES was created from a series of videos that consisted of various important learning segments, with each titled appropriately for its segment. These four segments of orientation consisted of (a) introduction to SES and eCollege, (b) utilizing audio setup wizard and white boards, (c) application sharing and file transfer on the fly, and (d) text chatting and recording. These four segments, totaling 30 minutes, prepared students to navigate and use the tools that they were using in their course. These segments were viewed privately by the students on their home or office computers from a YouTube video platform. This orientation was specifically for the NU online students as they were guided to access their respective courses from the NU site portal.

NU online courses are provided by eCollege Course Management System. A link from the eCollege course provides seamless navigation for the students to participate in a live chat that is provided by Elluminate Live, which is a Blackboard Management Systems software (Elluminate, n.d.). The interface between eCollege and Elluminate Live is seamless. The term *seamless* refers to easy access for the students between the two systems. Elluminate Live is activated by Java applets to facilitate the loading of CLP software. The interface screen, which is the web-conferencing environment, allows students to talk to each other and their instructor with their headset and microphones, writing on the white board and hosting all types of applications to share with the rest of the class. SES is a process to assist students with their pre-online course, which is developed to familiarize the students with the software and teach them step by step informally. This system assists the students so that they may receive the maximum interaction, which leads to more in-depth learning in synchronous online environments.

The purpose of developing the SES was to examine the amount and extent of any decrease in students' frustration and anxiety as they attended the synchronous course.

Toward the end of Week 4, before the course ended, students in both classes were given the postsurvey (see Appendix B and Appendix C). The postsurvey was distributed to determine whether there were any changes in students' anxiety and satisfaction levels, and their understanding of security issues of the shared content in the class. The postsurvey was developed by the researcher and was distributed to both groups of MBA students. The postsurvey for the CG (asynchronous) was the same as the presurvey, and there were no changes in the questions. The reason for both groups using the same presurvey was that there was no participation of the CG in the SES treatment. Therefore, the questions on the postsurvey for the CG were identical to those on the presurvey. The postsurvey for the EG (synchronous) was slightly different since the students received the SES treatment. The EG's postsurvey included three open-ended questions, whereby students provided a verification of their survey answers in a text format that strictly pertained to SES and factors related to students' frustration and anxiety when attending online courses.

The Development of the Synchronous Engagement System (SES)

The expectation was that the SES would decrease students' anxiety and frustration when attending an online synchronous course of study. The intention of the SES treatment was to show the students what to anticipate in a synchronous chat room, so they would have a preliminary understanding of what to expect in their online course delivery. Within the SES, the content included best practices for VoIP and web conferencing, as well as an introduction of tools that were utilized in the synchronous

chat rooms. These tools were designed to decrease or alleviate students' anxiety and frustration when attending online courses. The treatment introduced the tools and expectations for success in the online MBA courses.

The SES is a 30-minute overview of the Elluminate CLP application, with cursor movements along with voiceover features to explain each tool for a VoIP or web-conferencing course format to the students. This version of SES was created to engage NU's MBA students prior to their actual course and was sent to students through a link within the welcome e-mail. The SES link presented the features of Elluminate Live online web-conferencing and VoIP tool processes. The SES was located on the YouTube website, whereby every student could easily access it through various platforms. However, it was restricted to all public viewing, and access was permissible only by using the provided link. The links are provided in the description of each module in the following sections of this dissertation. The purpose of this tutorial was to show students how to use various features and tools that are relevant to their learning in synchronous chats during their coursework for the MBA program. This tutorial was developed by this researcher to assist students to understand more clearly how web-conferencing tools can support them in communicating with their instructor and classmates, and achieving the maximum benefits of their online course. To teach the students more effectively through SES, the first module started navigation from NU's portal. It has been observed that some new students are not aware of how to access their online course. Therefore, the first module guided students through the NU portal, described the eCollege and how to look for new items, and explained how to send and receive their assignments. It was anticipated that an introduction to synchronous chat would reduce students' anxiety and

frustration with web-conferencing VoIP chat rooms as they learned their subject matter material and interacted with their classmates in real time.

SES provided voiceover Elluminate Live application with cursor movements to introduce relevant features to students. Students specifically learned how to enter the course, utilize the microphone and headset, use drawing and writing tools on the white board, share applications, share their content, and when to activate the microphone and speak. The other relevant tools that were introduced to students included using the webcam, sending files on the fly, note taking, expressing their emotion, and raising their hand. In addition, and most importantly, students became familiar with how to view and listen to the recording of the sessions they missed and wished to review. The purpose was to apprise the students of the elements of the Elluminate Live application prior to starting the live synchronous chat, to help them overcome their stress and have all the needed tools to succeed in their MBA program.

The SES was designed and developed based on the acknowledgement in the literature of a need for a tool or set of tools to assist graduate students in alleviating their frustration and anxiety, which have been described in the research. One of the missions was to analyze the needs of new students in an eLearning environment. Consideration was given for the format of this tutorial to be more effective for new students or those who experience ongoing frustration in their online courses. The SES was designed and developed using Camtasia Studio 7 software. The script that was designed and used in developing the SES is available in Appendix D. The final product was divided into various modules. The reason for providing one or two learning segments in each module was to offer the freedom for viewers to choose the specific clip of the video they needed

to learn instead of viewing extra unneeded material. YouTube modules that have been printed, scanned, and copied are available to view in Appendix E of this document.

SES Module 1—Introduction to SES and eCollege

The first module of the SES was a welcome and introduction to the system. This module captured the researcher's personality through a live video in the lower right corner of the NU portal to give a glimpse of the person who created this tutorial. The orientation module prepared students from NU's portal webpage on how to sign onto the online environment. In order to access the live chat, students were shown how to access the asynchronous course that was provided by eCollege from Pearson Higher Education. In this module of the SES, there was a section that described how to upload and download assignments. Then there was an introduction on how to activate the live synchronous chat, which helped the students become more comfortable with the procedure. Students were able to click the live tab and enter the synchronous web-conferencing room. The link to this module (<http://www.youtube.com/watch?v=LTFXmyv2aKQ>) can be copied into an Internet browser to start the video on YouTube.

SES Module 2—Audio Setup Wizard and White Board

Upon entering the live chat room, the narrator talked and pointed to instruct the students on how to activate the headset to be able to speak in the class. Almost everyone needs to configure their headset according to the Elluminate Live environment. Therefore, it was important to cover this section upon entering the class so that students were able to activate their voice device and feel comfortable. Besides checking for audio

configuration, students were taught how to use the white board. The white board is a tool covering most of the screen of the user interface that facilitates writing with mouse movement or typing on the white page. Students were instructed on how to write and use various methods of pointing to specific parts of the board and changing the pointer accordingly. The video of the module is uploaded onto YouTube (<http://www.youtube.com/watch?v=mua4tT9h4pI>).

SES Module 3—Application Sharing and File Transfer

Application sharing is a powerful tool in web conferencing. The presenter can open any application on his/her own browser and share it with the whole class. This feature allows students to collaborate on group projects. It facilitates viewing the same screen by everyone for working on the same document at the same time. A significant part of this process is the students' collaboration, and pointing to and discussing the same topic in this modality provides a much higher focus on teamwork. Students' utilization of application sharing results in a more cohesive group-work experience among students, with less frustration and stress, in a virtual environment. In this global economy, collaboration on the same project from various parts of the world is needed in the business world. Therefore, it is important to prepare students for this skill.

File transfer on the fly allows students to send their files to their moderator in the class. File transfer basically simulates a procedure whereby students hand their work to their instructor in the class. The moderator receives the file via a dialogue box with an attachment. The only person who can upload any file to the Elluminate Live application is the moderator, and the only type of file that can be uploaded is a PowerPoint presentation. The file transfer feature helps when students need their file to be uploaded

into the system. In the MBA courses, a presentation of their final group project is usually part of the curriculum; therefore, this feature is important for the students to learn. This module can also be viewed on YouTube (<http://www.youtube.com/watch?v=Ae-j3jbo-Ig>).

SES Module 4—Text Chatting and Recording

Module 4 consisted of text chatting and recording. Although text chat is available, using voice communication in web conferencing is preferable. Using text chatting during lecture or just using the text as a way of communicating is not considered a best practice. It is similar to students mingling and talking in the back of the FTF classroom without giving attention to the rest of the class.

Many universities do not use web conferencing due to the fact that they believe the attractiveness of online education is the freedom of not being tied down to a specific time for learning. They believe synchronous meetings will reduce the flexibility of the online programs. The fact is, the recording of the class meetings can solve this important issue. If students cannot be part of the synchronous meetings, they have the opportunity to watch the recording of the meetings and stay updated with materials discussed in the class chats. The details of this module can be viewed on YouTube (<http://www.youtube.com/watch?v=C-gW8kKSGB8>).

Data Collection and Analysis

Demographics were analyzed through descriptive statistics, and data for inferential statistics were analyzed based on mean and median scores using the Statistical Package for Social Science (SPSS) to identify chi-square analysis for certain questions.

The open-ended question data were examined through qualitative analysis. The two sets of data were collected through presurveys and postsurveys from both the EG and the CG. These surveys were collected and managed by NU's OIRA.

The inferential statistics were analyzed using chi-square tests because the data collected were interval data, not numerical data. Likert-scale surveys do not represent numerical weight, but a rank order of 1-5 was designated corresponding to *strongly disagree*, *disagree*, *neutral*, *agree*, and *strongly agree*. In addition, there were comparisons between presurveys and postsurveys, as well as comparisons between the two courses. The outcome from each group was compared using individual questions from presurveys and postsurveys. The statistical comparison addressed the research questions related to students' anxiety in online classes. The SES was developed based on the assumption that MBA students at NU were experiencing anxiety and frustration while attending online courses. The qualitative analysis was based on the four open-ended questions from the EG postsurvey. The comments that students provided were used to address each research question (Research Question 3 and Research Question 4) associated with students' perceptions of other factors related to students' anxiety, and students' belief of how the SES helped them decrease their anxiety and frustration in attending online classes.

Ethical Considerations and Security

Students' privacy and security profiles are kept confidential by the OIRA for 3 years after the study, at which time they will be destroyed. The survey was administered and controlled by the OIRA; this department ensures the security of information and confidentiality of the students' responses and participation. The researcher was not able

to identify individual students and connect them to their answers nor will others who might use the data in the future. Therefore, the confidentiality of the students' profiles and connecting them to responses is kept confidential as long as these data are available.

Summary

The purpose of this study was to investigate to what extent the use of SES as an eLearning tool or set of tools assisted graduate students with alleviating frustration and stress when attending online courses. The knowledge of the existence of anxiety and stress among MBA students has been presented in the literature. The current study investigated the effectiveness of a SES to alleviate students' anxiety when attending online courses in an MBA program. A presurvey was sent to students attending the MGT 608 courses, to measure students' stress related to both synchronous and asynchronous classes. The synchronous class also received the SES intervention before the start of the class. The quasi-experimental design was to determine if the SES alleviated the feelings of anxiety and stress among online MBA students.

Chapter 4

Results

This study examined the extent of frustration and anxiety that students have while they are attending online courses. Literature indicated the need for the development of synchronous engagement systems (SES) to help alleviate frustration and anxiety. Therefore, after the development of SES, an experimental investigation was conducted of two online classes in the Master of Business Administration (MBA) program at National University (NU). With a quasi-experimental design, two online courses participated as the experimental group (EG) and the control group (CG). The study examined the effect of the SES on students' frustration and anxiety while taking an online class.

Table 1 specifies the two groups and the abbreviations that are used to identify their surveys. The presurveys of the EG and the CG are categorized as EA and CA, respectively, and the postsurveys of each are categorized as EB and CB, respectively. Table 1 also shows the number of students in each group who participated in the presurvey and the postsurvey.

The population of the two courses that were used in the quasi-experimental design consisted of 60 students. These 60 students were split between the two classes; however, from these 60 students, only 38 participated in the presurvey and postsurvey. The total of 38 students resulted in 21 students from the CG and 17 students from the EG.

Table 1

Abbreviations of the Surveys

Survey	Number of students	Group abbreviation
Control group presurvey	21	CA
Control group postsurvey	21	CB
Experimental group presurvey	17	EA
Experimental group postsurvey	17	EB

Demographic Findings

This section specifies the demographic variables that were gathered from Survey Questions 1-7 for both the CG and the EG in the study. Since the demographic information did not change during the study, the data from both groups' presurveys were analyzed for the demographic results. Tables 2 through 6 specify the particular data that resulted from Survey Questions 1-7.

Table 2 portrays the age of the students who participated in the study. The majority of the students in both groups fell within the age range of 26-35. This information indicated that these students who are enrolled in the MBA program are at the beginning of their career.

Table 2

Students' Age Range by Groups

Group	20-25	26-35	36-45	Over 45	Total
Control	1	10	9	1	21
Experimental	2	11	3	1	17
Total	3	21	12	2	38

Table 3 displays data on the students' computer competency. The first part of Table 3 represents the students' competency before taking the management course. A majority of students believed that they had intermediate computer skills prior to beginning this course. Examining the presurvey results, more students from the CG believed they had intermediate computer skills compared with students from the EG. However, as shown in the second part of Table 3, the postsurvey results yielded a slight increase in computer competency in both the CG and EG because the students considered themselves experts after the course was completed. The postsurvey revealed that students changed their beliefs regarding their computer competency. The results showed that novice and beginner categories from the postsurvey were basically not indicated. All the participants believed they had stronger computer competency after attending the course.

Table 3

Presurvey and Postsurvey Results on Students' Perceptions of Their Computer Competency

Group	Novice	Beginner	Intermediate	Expert	Total
Presurvey					
Control	0	2	15	4	21
Experimental	1	0	9	6	16
Total	1	2	24	10	37
Postsurvey					
Control	0	1	16	4	21
Experimental	0	0	9	8	17
Total	0	1	25	12	38

Note. One student from the EG did not provide an answer to this question on the presurvey.

Table 4 identifies the number of online courses that students had taken up to the month of the survey in their MBA program. As the table indicates, the majority of the students in both the CG and the EG had taken seven or more online courses. There were only about three students in each group who were new to online courses. Since most students had taken more than seven online courses, their anxiety from online courses might have decreased due to their experience and exposure to online classes.

Table 4

Number of Online Courses Students Have Taken

Group	1-3	4-6	7 or more	Total
Control	3	2	16	21
Experimental	3	5	9	17
Total	6	7	25	38

Table 5 identifies the number of synchronous voice-conferencing chats students had joined. A majority of students in the study had joined at least seven chat sessions in their online classes. Since the majority of the students had joined synchronous voice chats, this may have influenced their comfort with participating in VoIP web-conferencing sessions. This might have been a reason for the decrease in anxiety that students experienced when taking online classes. Consequently, the more online voice-conferencing experiences they had, the less anxiety they felt when attending online classes.

Table 5

Number of Synchronous Voice-Conferencing Chats Students Have Joined

Group	None	1-3	4-6	7 or more	Total
Control	2	1	4	14	21
Experimental	1	4	1	11	17
Total	3	5	5	25	38

Table 6 indicates that students' level of anxiety changed from the presurvey, where many reported being anxious taking online courses, to the postsurvey, where most reported not being anxious. Based on the current study, the research indicated the change in students' anxiety level might have been due to the exposure to and the practice of using the SES. Students who reported never taking online courses and who experienced the SES and participated in the surveys noted a decrease in their anxiety after completing this course. Therefore, there was a general decrease in students' anxiety level found in the postsurvey results.

Table 6

Students' Level of Anxiety About Attending Voice-Conferencing Chats During Their Online Course

Number of courses taken online	Feel anxious	Do not feel anxious	Have not taken an online course and/or have not experienced voice-conferencing chats	Total
Presurvey				
1-3	3	3	0	6
4-6	1	5	0	6
7 or more	6	18	2	26
Total	9	26	2	38
Postsurvey				
1-3	0	6		6
4-6	1	6		7
7 or more	6	19		25
Total	7	30		38

Data Analysis and Results

There were three types of analysis used for this study. Descriptive analysis was used to analyze demographic variables using the data from Survey Questions 1-7. To answer Research Question 1, descriptive statistics were used in the form of mean and median to analyze data from Survey Questions 9, 11, 12, 15, 16, 18, and 19. To answer Research Question 2, SPSS for inferential statistics was utilized analyzing chi-square tests for the data from Survey Questions 13, 17, and 20. To answer Research Question 3, qualitative analysis was used for the responses to Survey Questions 8 and 23 to address what other factors affect students' frustration and anxiety when taking online courses. To answer Research Question 4, qualitative analysis was used for the responses to Survey Questions 21 and 22 to address the strengths and weaknesses of the SES. Results from

Survey Questions 10 and 14 were not used for any analysis because these two questions were redundant with Survey Questions 9 and 13.

Research Question 1

Research Question 1 asked, “How and to what extent do students enrolled in online classes experience frustration and anxiety related to their courses?” Figure 1 lists survey questions that pertained to Research Question 1. Each survey question was analyzed with descriptive statistics, and results are presented in tables. For the convenience of analysis, the scale of the responses to each survey question was converted to numbers (i.e., 1 = *strongly disagree*, 2 = *disagree*, 3 = *neutral*, 4 = *agree*, and 5 = *strongly agree*).

- | |
|---|
| <ul style="list-style-type: none"> 9. Online classes cause me anxiety. 11. Using computers and technology in online courses cause me stress. 12. I prefer to know about course requirements before starting the course. 15. I am anxious when initiating a threaded discussion. 16. I am anxious when responding to peers' threaded discussions. 18. I get intimidated about speaking among my cohorts in the class. 19. I would be stressed if I discovered that my contributions are not secure in the web conferencing environment. |
|---|

Figure 1. Survey questions relevant to Research Question 1.

For Survey Question 9, students rated how strongly they agreed with the statement, “Online classes cause me anxiety.” The data revealed how many students experienced anxiety caused by attending online courses. Table 7 shows the results from the students' responses to this survey question before and after the study. As shown in the first part of Table 7, the mean scores from the presurveys (CA = 2.24; EA = 1.88)

indicated that students tended to disagree that online classes caused anxiety. The second part of Table 7 shows the mean scores from the postsurveys (CB = 1.90; EB = 1.65), which indicated that after the study, the students in both groups tended to experience less anxiety in the online classes than they did before the study.

Table 7

Frequency, Mean, and Median Responses to Survey Question 9: "Online Classes Cause Me Anxiety"

Group	Frequency					<i>M</i>	<i>Mdn</i>
	1	2	3	4	5		
Presurvey							
Control	7	7	3	3	1	2.24	3
Experimental	2	8	2	2	0	1.88	2
Postsurvey							
Control	6	10	2	1	2	1.90	2
Experimental	6	11	0	0	0	1.65	2

Note. Three students from the EG did not provide an answer to this question on the presurvey.

For Survey Question 11, students rated how strongly they agreed with the statement, "Using computers and technology in online courses cause me stress." The data portrayed in Table 8 show the results from the students' responses to this survey question before and after the study. As shown in the first part of Table 8, the mean scores from the presurveys (CA = 1.81; EA = 1.88) indicated that students tended to disagree that using computers and technology in online courses caused them stress. The second part of Table 8 shows the mean scores from the postsurveys (CB = 2.35; EB = 1.59), which indicated that after the study, the students in the CG experienced a greater degree of anxiety about using computers in online classes. Overall, students' anxiety level decreased on the

postsurvey results. Therefore, after the course and exposure to the SES (for the EG), on the postsurvey, students' anxiety level changed and students felt less anxious.

Table 8

Frequency, Mean, and Median Responses to Survey Question 11: "Using Computers and Technology in Online Courses Cause Me Stress"

Group	Frequency					M	Mdn
	1	2	3	4	5		
Presurvey							
Control	8	10	2	1	0	1.81	2
Experimental	5	10	1	1	0	1.88	2
Postsurvey							
Control	3	9	3	2	3	2.35	2
Experimental	8	8	1	0	0	1.59	2

Note. One student from the CG did not provide an answer to this question on the postsurvey.

For Survey Question 12, students rated how strongly they agreed with the statement, "I prefer to know about course requirement before starting the course." The data indicated students' preference to know about the course requirements before the course begins. Table 9 shows the results from the students' responses to this survey question before and after the study. As shown in the first part of Table 9, the mean scores from the presurveys (CA = 3.70; EA = 3.40) indicated that students tended to agree that they need to know about course requirements before starting the course. The second part of Table 9 shows the mean scores from the postsurveys (CB = 1.81; EB = 4.47). The CG tended to disagree after completing the course that they need to know about the course requirements before starting a course. The reason for this change may be that after this specific course completion, it did not matter whether or not they knew about the course

requirements before starting the course. However, the EG felt a greater need to receive the course materials prior to the start of the course.

Table 9

Frequency, Mean, and Median Responses to Survey Question 12: "I Prefer to Know About Course Requirement Before Starting the Course"

Group	Frequency					M	Mdn
	1	2	3	4	5		
Presurvey							
Control	0	1	4	16	0	3.70	5
Experimental	1	1	6	9	0	3.40	5
Postsurvey							
Control	8	11	0	2	0	1.81	2
Experimental	1	0	1	3	12	4.47	5

For Survey Question 15, students rated how strongly they agreed with the statement, "I am anxious when initiating a threaded discussion." The results indicated that students felt anxious when initiating a threaded discussion. Table 10 shows the results from the students' responses to this survey question before and after the study. As shown in the first part of Table 10, the mean scores from the presurveys (CA = 2.00; EA = 1.82) indicated that students tended to disagree that initiating a threaded discussion caused them anxiety. The second part of Table 10 shows the mean scores from the postsurveys (CB = 3.76; EB = 2.35), which indicated that after the study, the students in both groups tended to experience more anxiety in initiating threaded discussions.

Table 10

Frequency, Mean, and Median Responses to Survey Question 15: "I Am Anxious When Initiating a Threaded Discussion"

Group	Frequency					M	Mdn
	1	2	3	4	5		
Presurvey							
Control	5	8	4	3	1	2.00	2
Experimental	7	7	2	1	0	1.82	2
Postsurvey							
Control	1	2	5	6	7	3.76	4
Experimental	2	10	2	3	0	2.35	2

The data showed an increase in anxiety on the postsurveys, indicating that after the course was completed, there was an increase in the number of students who felt anxious when initiating threaded discussions. The reason for this increase in anxiety on the postsurvey results may be that students were required to initiate at least two substantial posts per week that included library research and appropriate references.

For Survey Question 16, students rated how strongly they agreed with the statement, "I am anxious when responding to peers' threaded discussions." The results presented students' level of anxiety when responding to peers' threaded discussions. Table 11 shows the results from the students' responses to this survey question before and after the study. As shown in the first part of Table 11, the mean scores from the presurveys (CA = 2.42; EA = 1.76) indicated that students tended to disagree that they were anxious when responding to their peers' threaded discussions. The second part of Table 11 shows the mean scores from the postsurveys (CB = 1.52; EB = 2.07), which indicated that after the study, the students in the CG tended to experience less anxiety in responding to their peers' threaded discussions. Conversely, the EG tended to experience

greater anxiety on the postsurvey while responding to their peers' threaded discussions. The reason for this change among both groups may be that the CG was not involved in synchronous chat (VoIP) while the EG experienced the synchronous chat, which may have caused the change in anxiety about responding to their peers' threaded discussions.

Table 11

Frequency, Mean, and Median Responses to Survey Question 16: "I Am Anxious When Responding to Peers' Threaded Discussions"

Group	Frequency					M	Mdn
	1	2	3	4	5		
Presurvey							
Control	5	6	5	1	2	2.42	2
Experimental	8	6	2	1	0	1.76	2
Postsurvey							
Control	7	6	2	5	1	1.52	2
Experimental	2	11	1	1	0	2.07	2

Note. Two student from the CG did not provide an answer to this question on the presurvey, and two students from the EG did not provide an answer to this question on the postsurvey.

For Survey Question 18, students rated how strongly they agreed with the statement, "I get intimidated about speaking among my cohorts in the class." The results related to students' intimidation when speaking in front of cohorts are indicated in Table 12. As shown in the first part of Table 12, the mean scores from the presurveys (CA = 2.24; EA = 2.06) indicated that both the CG and EG tended to disagree that they get intimidated speaking among their cohorts in the class. The second part of Table 12 shows the mean scores from the postsurveys (CB = 3.19; EB = 2.12), which indicated that after the study, the students in the CG tended to experience higher anxiety, which may be the

result of not being exposed to the SES. The students in the EG also experienced a slight increase in intimidation about speaking among their cohorts. The cause of this increase may be related to students being self-conscious even though they have become familiar with the SES and have been exposed to the VoIP tools in the course.

Table 12

Frequency, Mean, and Median Responses to Survey Question 18: "I Get Intimidated About Speaking Among My Cohorts in the Class"

Group	Frequency					M	Mdn
	1	2	3	4	5		
Presurvey							
Control	5	6	3	4	3	2.24	4
Experimental	6	7	1	3	0	2.06	3
Postsurvey							
Control	3	3	5	7	3	3.19	3
Experimental	6	6	2	3	0	2.12	2

For Survey Question 19, students rated how strongly they agreed with the statement, "I would be stressed if I discovered that my contributions are not secure in the web conferencing environment." The results of this presurvey question indicated that students would be anxious if they discovered their contributions were not secure in the web-conferencing environment. Table 13 shows the results from the students' responses to this survey question before and after the study. As shown in the first part of Table 13, the mean scores from the presurveys (CA = 2.80; EA = 2.94) indicated that students tended to agree that they would feel stressed if their contributions were not secure. The second part of Table 13 shows the mean scores from the postsurveys (CB = 2.43; EB = 2.82), which indicated that after the study, the students in both groups reported that they

would experience less stress if they discovered that their contributions were not secure. The data showed a slight decreased in the stress levels of students in regard to security relating while sharing knowledge.

Table 13

Frequency, Mean, and Median Responses to Survey Question 19: "I Would Be Stressed if I Discovered That My Contributions Are Not Secure in the Web Conferencing Environment"

Group	Frequency					M	Mdn
	1	2	3	4	5		
Presurvey							
Control	3	6	6	2	3	2.80	3
Experimental	5	1	3	6	2	2.94	3
Postsurvey							
Control	4	10	3	2	2	2.43	2
Experimental	4	3	3	6	1	2.82	3

Note. One student from the CG responded with N/A to this question on the presurvey, and that answer was not included in the calculation.

In the findings for Research Question 1, several noteworthy differences between the presurvey and postsurvey results were indicated. For example, students in the CG indicated less anxiety about using computers before the class, while on the postsurvey they reported higher mean scores in feeling stressed about using computers and technology. The EG's mean score on the presurvey indicated more anxiety about using computers and technology; on the postsurvey, they reported less anxiety about using technology and computers in online courses after using SES. The reason for a higher mean score for the CG on the postsurvey could be related to the group not using the intervention of SES.

The data from Survey Question 12 reported that the CG indicated on the presurvey that they preferred to receive the course requirements prior to the start of the course, while the postsurvey results were drastically lower. This change could be related to the CG's feeling after completing the course that they did not need to have the course requirements prior to this specific course. The EG reported an increase on the postsurvey of preferring to receive the course requirements before the start of the class. Therefore, the EG believed that all courses need to provide course requirements prior to the start of the class.

The results of Survey Question 15, which indicated that students' anxiety about initiating threaded discussions increased in CB and EB, may be due to extensive requirements on this assignment for this course. Students were required to initiate two threaded discussions per week using credible library resources and proper writing skills. Another reason for this concern may be that the students' writing and thoughts were exposed to cohorts who would read and comment on the posts.

The results of Survey Question 18, which indicated that students feel anxious about speaking among their cohorts in the synchronous class, reported a drastic change between CA and CB. The reason for this gap may be that the CG did not receive the SES intervention and still feels anxious speaking in the synchronous chat using a microphone. The gap between EA and EB was minimal since in the EG used the SES.

Research Question 2

Research Question 2 asked, "How will web-conferencing VoIP tools and SES affect online students' frustration and anxiety and potentially help overcome students' apprehension toward online courses?" Figure 2 lists Survey Questions 13, 17, and 20,

which are related to Research Question 2. These survey questions addressed students' frustration and anxiety during the synchronous chat using web conferencing and VoIP. The results from Survey Questions 13 and 17 were analyzed using inferential statistics and utilizing chi-square tests. Survey Question 20 gathered data on the students who participated in using the SES. Results of Survey Questions 13, 17, and 20 are displayed in figures. The figures represent the analysis of these questions. Each figure compares the CG to the EG.

- | | |
|-----|---|
| 13. | I prefer an asynchronous (no real time chat VoIP and web conferencing) solitary course environment. |
| 17. | I am usually comfortable speaking in a VoIP/web conferencing session |
| 20. | My feelings about online participation have changed as a result of working with SES. |

Figure 2. Survey questions relevant to Research Question 2.

Figures 3 and 4 show the results obtained for Survey Question 13, which asked students to rate how strongly they agreed with the statement, "I prefer an asynchronous (no real time chat VoIP and web conferencing) solitary course environment." As shown in Figure 3, in the presurvey, there was no significant difference between the responses of the CG and the EG ($p = .125$). This means that before the study, the CG and the EG did not have significant differences in their preference for an asynchronous class environment. Figure 4 shows a significant difference between the CG and the EG in their responses after the study ($p = .002$). More students in the EG disagreed that they prefer the asynchronous class environment, and more students in the CG agreed that they prefer the asynchronous class environment. This shows evidence that the experiment (i.e., the

use of the VoIP tools and the SES) had an effect on the students in the EG and resulted in a significant difference between the EG and the CG.

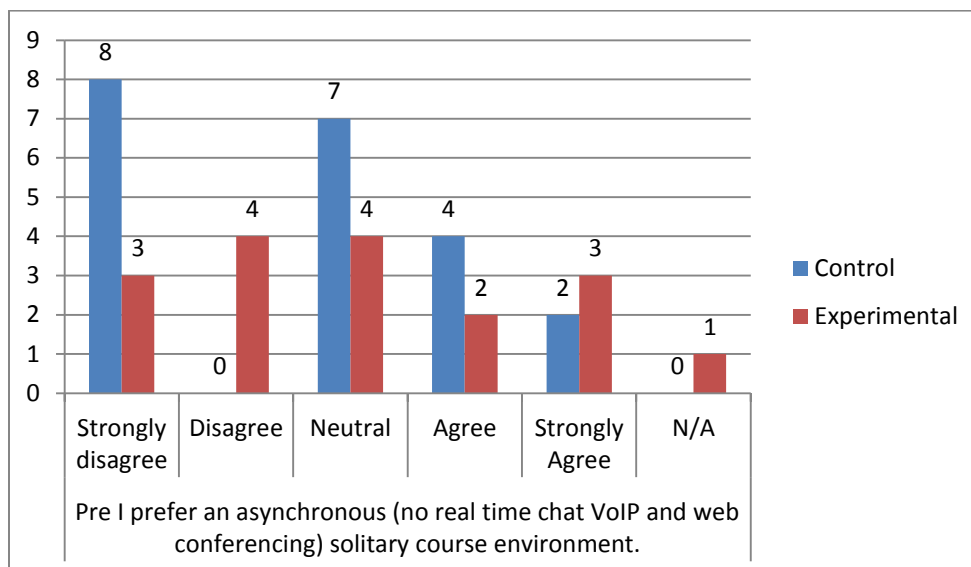


Figure 3. Presurvey results for Survey Question 13. $X^2(5) = 8.632, p = .125$.

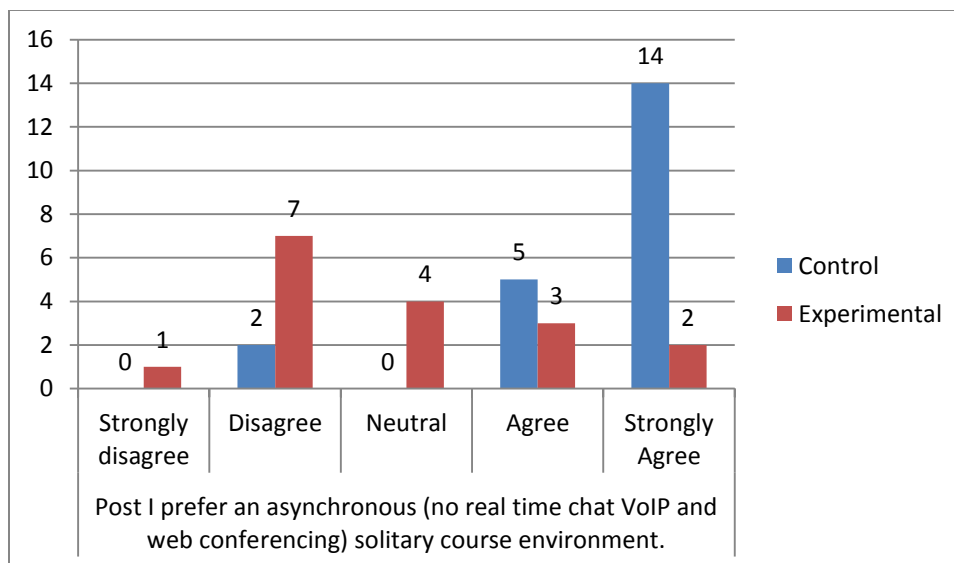


Figure 4. Postsurvey results for Survey Question 13. $X^2(4) = 17.046, p = .002$.

Survey Question 17, "I am usually comfortable speaking in a VoIP/web conferencing session," yielded close to significance. Figures 5 and 6 show the results

obtained for Survey Question 17. As shown in Figure 5, in the presurvey, there was no significant difference between the responses of the CG and the EG ($p = .532$). This means that before the study, the CG and the EG did not have significant differences in their comfort level in speaking in VoIP conferencing format. Figure 6 shows a significant difference between the CG and the EG in their responses after the study ($p = .056$). More students in the CG disagreed that they feel comfortable speaking in a VoIP environment. The EG agreed that they feel comfortable speaking in VoIP. This shows evidence that the experiment (i.e., the use of the VoIP tools and the SES) had an effect, which indicated a significance difference between the EG and the CG.

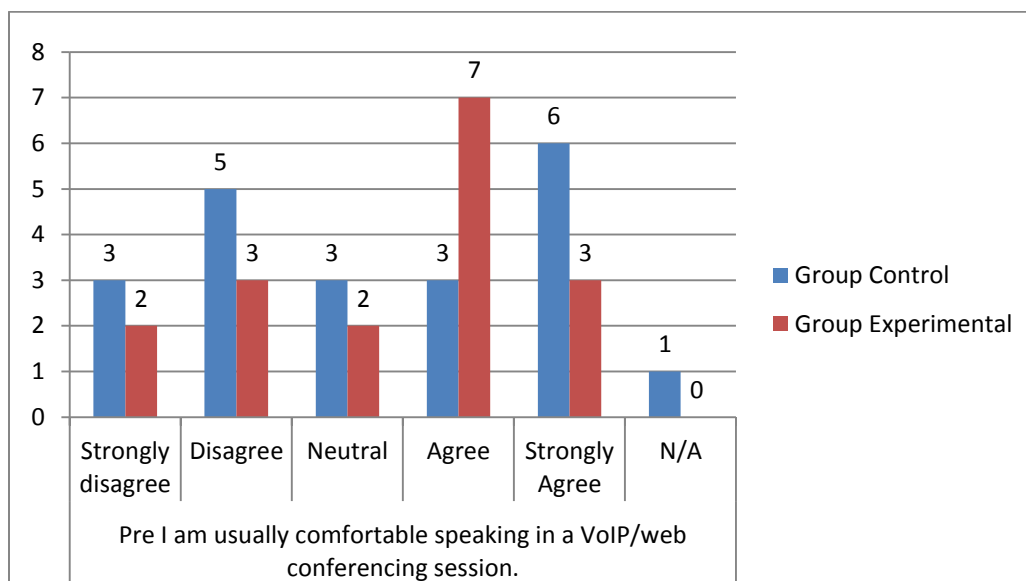


Figure 5. Presurvey results for Survey Question 17. $X^2(6) = 4.125, p = .532$.

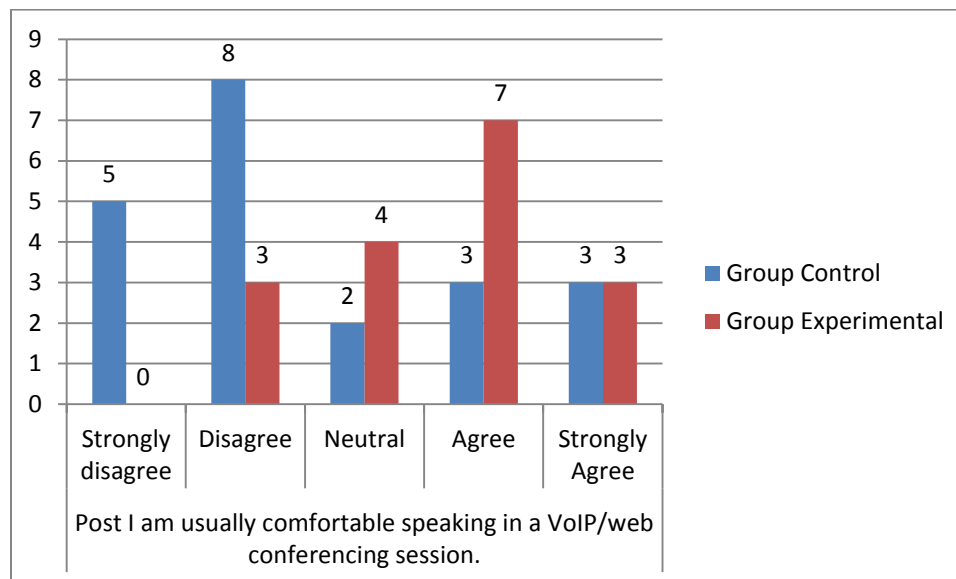


Figure 6. Postsurvey results for Survey Question 17. $X^2(5) = 9.22, p = .056$.

For Survey Question 20, students in the EG rated how strongly they agreed with the statement, “My feelings about online participation have changed as a result of working with SES.” The postsurvey revealed students’ feelings on the SES’s usability. Figure 7 represents the postsurvey question analysis of the EG results on a Likert scale. The results indicated that seven students strongly agreed or agreed that the exposure to the SES positively enhanced their learning in online courses. Six students strongly disagreed or disagreed that there was a benefit in viewing the SES. Three students were undecided on the benefit of using SES for online courses.

The qualitative responses on students’ participation after exposure to SES were distributed evenly. This study seemed to have enough participants for data gathering; however, it is evident that more participants could contribute to differentiation of responses. In addition, the open-ended question that produced the results in figure 7 may need to be rephrased more specifically to achieve variation. More research needs to be

conducted to evaluate the students feeling and satisfaction of online synchronous learning.

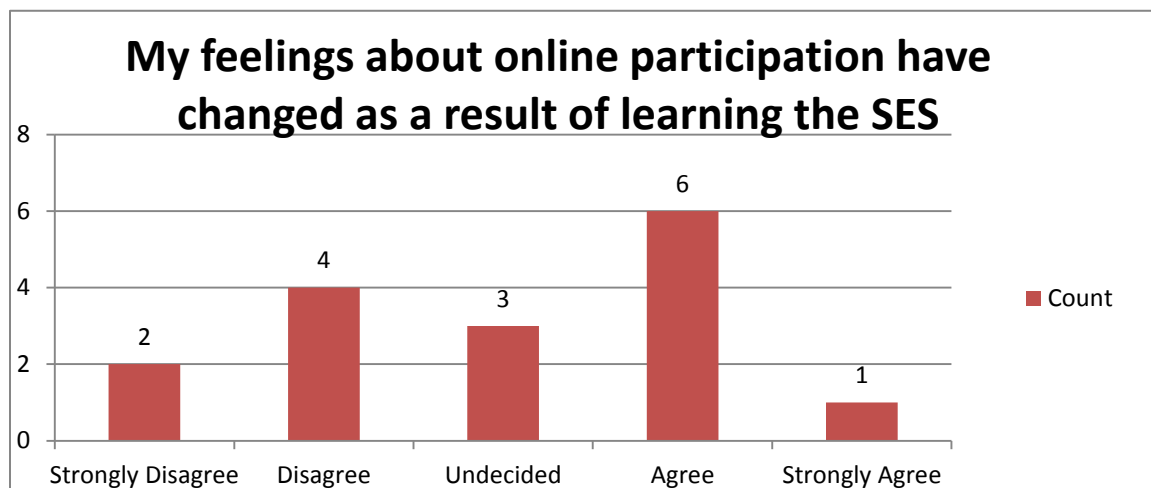


Figure 7. Results for Survey Question 20.

Research Question 3

Research Question 3 asked, “What other factors affect online students’ frustration and anxiety?” Research Question 3 probed for any additional comments on other factors that cause students frustration and anxiety. Survey Questions 8 and 23 on the postsurvey provided an opportunity for students to express their feelings about attending online courses. Their individual statements provided concern about their frustration and anxiety. Students were assigned a letter in order to protect their identity and confidentiality. These statements appear exactly as the students wrote them on the survey.

These statements are qualitative examples of what the students noted as other important factors that affect their frustration and anxiety. For example, Student A noted, “I always worry about the significant of my contribution to the class.” Student B added, “I do not like to talk on the microphone.” Student C wrote, “I do not know how voice conferences work and I am worried that I will not be able to understand and to do well on

them.” Student D explained, “It is hard to have a dialogue between classmates, because only one person can speak at a time. If not, there is an echo or heavy feedback. Also, having everyone’s attention on you, it is kind of intimidating.” Additionally, Student E expressed frustration by noting, “I do not like the concept of chatting in an online class. I preferred the standard format in online learning.” Student F wrote, “Courses in general are stressful, but chat sessions make it worse because I have yet to have one that has provided me with useful information.” Student G said, “The program that NU uses is not user-friendly.” Students H added, “I sometimes feel rushed joining sessions after work.”

The other factors that affect online students’ frustration and anxiety appeared to be associated with students’ hesitation in speaking into the microphone. The following comments were captured from the feedback on the open-ended answers in regard to other anxiety factors in online classrooms among students: “It is hard to talk to people I have never met before” (Student I); “Speaking in an online class is new to me, so I get anxious thinking I will be called on” (Student J). Additionally, students expressed other factors that resulted in their frustration and anxiety. For example, Student K noted, “I always worry about the significance of my contribution to the class. Since this class is relatively new to me, I get anxious as it approaches.” The data collected from this study indicated that students are still experiencing frustration and anxiety when attending online synchronous courses.

Students’ responses related to Research Question 3 involved issues of technology. The issues included being dropped out of the class due to network and server discrepancies, minor glitches in connecting to the Class LivePro during the peak time, and problems with voice echo and voice lag time, which is normal in VoIP technology

during peak hours. One student specified the unreliability of YouTube as a source for teaching.

Research Question 4

Research Question 4 asked, “What are the best practices for using SES tools and VoIP?” The answers to this question are reported from students’ qualitative survey statements. The two open-ended questions, Survey Questions 21 and 22, addressed Research Question 4. Survey Question 21 asked, “What were the strengths of SES?” Survey Question 22 asked, “What were the weaknesses of SES?” These two open-ended survey questions offered the option for students in the EG to explain the advantages and disadvantages of using the SES. These statements appear exactly as the students wrote them on the survey.

In response to Research Question 4, Student A said, “I preferred synchronous chats when they were used adequately and focused on the topic. When others were off task and not prepared for the topic the chat was a waste of time.” Student B noted, “Synchronous chat was helpful at the beginning of the course because I could hear my professor and feel connected. Verbalizing the course requirements and answering questions first hand helped me.” Therefore, based on Students B’s comments, synchronous chats should be instituted regularly during the course. Student C wrote,

The more engaged the professor was with students the better it was. One good benefit I recall viewing the SES system via YouTube.com was the instructor’s detailed outline and the protocol/steps necessary in order to work with the SES system.

This student believed that the best practice of the instructor’s detailed outline was beneficial to student success with SES. Students were complimentary regarding the use

of SES and its effectiveness. Student D stated, “There was better interaction between instructor and student, and better communication among students.” This student believed that the interaction was part of the success and understanding of the SES. Student E wrote, “You’re leveraging technology to provide a NU student another average of learning about an online class capability called eCollege and Class Live Pro.” This student saw an advantage in how the SES provided the value of the technology for alleviating student stress. Student F added, “I actually enjoyed the interaction that SES taught me.” Student F expressed a comfort level in interaction that SES provided during the web conferencing. Student G said, “The SES was a great preparation for speaking with the instructor and peers.” Student H noted, “It forced me to be an active participant.” Student I stated, “I feel more comfortable when I volunteer to speak rather than have my instructor call on me.” Student J said, “This was my first online class and now I want all my classes to be synchronous classes.” Student K explained, “I appreciated the flexibility of listening to the live chat discussion while I was traveling.” These comments represent a variety of students’ feedback related to their experiences using the SES.

Survey Question 21 addressed students’ qualitative responses to Research Question 4. In addition to students’ qualitative responses, the Research Question 4 was also analyzed using percentages. The students in the EG who received questions about utilization of the SES, 22 responded. Results of Survey Question 21 indicated that 41% of the students agreed or strongly agreed that the SES was helpful in promoting their participation. Students believed that they were more comfortable participating in the online course after viewing the SES. This comfortable feeling may be a consideration for a decrease in students’ anxiety and frustration. Student F responded as follows: “My

feelings about online participation; I have continuously been a proponent of it. However, the more engaged and interaction there is amongst the proctor and students the better.” Student K’s feedback after viewing the SES was, “It provided the students with an actual visual of an instructional video on how to get started with class live pro, which greatly helped me as a new student.”

The following responses from Survey Questions 21 and 22 address positive and technical issues regarding the SES. All the responses were typed word for word from students’ direct responses: “This was my first online class, and now I would like all my classes to be in synchronized chat, I am a FTF student, this form of instruction was a good mix of classroom and online instructions” (Student J); “Good sound quality and recorded session to refer to” (Student B); “It provides the student who has not participated in any online class format at NU with an actual visual of an instructional video on how to get started with Class Live Pro, before they start the online class” (Student C); “After previewing the SES, participation in Class Live Pro, which was great; when asking questions and receiving the professor’s quick responses in a the chat session was a wonderful experience. Professor S. responded timely, so it was good” (Student D); “Overall the SES was an interestingly good experience” (Student E); “The SES was easy to use/self-explanatory” (Student F).

Summary

The research indicated that there were several questions that yielded statistically significant findings. Based on the presurveys and the postsurveys, among both groups, students’ feelings changed regarding their anxiety. The presurvey revealed that students felt anxious before the start of the course. The results of EB yielded a decrease in anxiety.

Students believed the SES helped them as they fulfilled the content requirements of the course. For example, before they were exposed to the SES, students indicated their frustration in taking an online course. However, this anxiety was alleviated as indicated in the postsurvey, which was the result of utilizing the SES. Students indicated this result both quantitatively and qualitatively.

Another important finding in the study showed that students were anxious to receive the course content and feedback on their questions in a synchronous format. Additionally, students felt uncomfortable initiating threaded discussions because they were afraid to be judged on their writing and on their posts. The study revealed that students preferred interaction and collaboration with their instructor and peers during the synchronous sessions. However, they did not prefer synchronous chat sessions more than once a week. Students who had to meet more than once a week felt a time constraint on their schedule. The study did present changes in students' level of anxiety and frustration. Some of the results specified students' changes in anxiety because they expressed qualitatively how they felt more comfortable taking online classes after attending this course. Other changes in students' anxiety levels were found through statistically significant results from the quantitative data between the presurvey and postsurvey results.

Chapter 5

Conclusion, Implications, Recommendations, and Summary

Conclusion

The purpose of the study was to investigate to what extent the use of synchronous engagement systems (SES) as an eLearning tool or set of tools assisted graduate students with alleviating frustration and stress when attending online courses. The study addressed four research questions:

1. How and to what extent do students enrolled in online classes experience frustration and anxiety related to their courses?
2. How will web-conferencing VoIP tools and SES affect online students' frustration and anxiety and potentially help overcome students' apprehension toward online courses?
3. What other factors affect online students' frustration and anxiety?
4. What are the best practices for using SES and VoIP?

A quantitative methodology in the form of a Likert-scale survey was the basis for addressing the research questions in this study. As a result of the literature review, it was determined that Master of Business Administration (MBA) students do experience anxiety and stress when attending an online course. The quantitative study was a quasi-experimental design that included two groups of MBA students that were divided into asynchronous and synchronous classes. The demographic information from Survey

Questions 1-8 was presented through the tables in Chapter 4 that represented the background data of the MBA students. Survey Questions 9, 11, 12, 15, 16, 18, and 19, presented through descriptive statistics, addressed Research Question 1. Research Question 2 was addressed through the inferential statistics using chi-square tests for Survey Questions 13 and 17. Survey Question 20 gathered responses from students in the experimental group (EG) who answered the Likert-scale question on their preference for using synchronous engagement systems (SES), and the data were used to create a bar chart to answer Research Questions 2.

The majority of the students in both groups were between 26 and 35 years old. The university where the study was conducted is an institution that enrolls working adults who want to advance their careers and pursue a higher education. Students were asked about their computer competency, and their responses indicated that they believed their computer skills were at an intermediate level before beginning the course. After participating in the course, students' perceptions of their competency improved. Students who believed their competency was novice or beginner perceived it as intermediate after they completed the course. Some students believed they qualified at expert level, which increased slightly after they completed the course. The last question describing demographics indicated that students participated in seven or more synchronous voice chat classes. They seemed to have knowledge of attending Voice over Internet Protocol (VoIP) synchronous classes.

Results of the current study indicated that upon completion of the course, students in the control group (CG) might have been more comfortable with the course format and felt the number of courses they had taken helped them become less anxious. Students in

the current study reported taking more than seven courses online. Havelka et al. (2004) supported the findings of the study regarding anxiety levels changing. The authors specified in their study that change was due to the number of online courses students attended and their level of comfort. Their research might relate to the findings of the current study on students feeling comfortable speaking in VoIP web-conferencing format. To support the current study results, Havelka et al.'s study verified the need for students' exposure to online course format and structure. As Havelka et al. stated, students' familiarity with taking online courses and experiences with computers could have been factors that influenced their low levels of anxiety. Additionally, a study conducted by Conrad (2002) showed that students' anxiety level was raised when the instructor posted information for the class before the beginning of the course. Instead of welcoming the preposting as an introductory mode of decreasing student anxiety, students felt an increase of frustration because they believed that they were behind in the requirements if they saw postings before the class began. Since Conrad's study specified students' anxiety before the class began, it might hold similar results to the current study of anxiety of students.

Survey Question 12 gathered data on students' preference for knowing about course requirements before class began. Students in the CG and the EG reported in the presurvey that they preferred to know about course requirements before the course began. However, after course completion, students in the CG did not prefer to know about the course requirements. Students in the EG reported an increased preference to know about course requirements before the class began. The current study yielded a difference between the groups in their preference for knowing about course requirements before the

class begins. The literature did not address the issue of exposure to course requirements before the course begins. It is apparent that the study presents new information regarding issues of anxiety and knowledge of course requirements before students start a course. Further investigation into the reasons that students in the control group changed their preference for not wanting to know about course requirements before the course begins would help determine the reasons for increases or decreases in their anxiety level. The current study partially fills a gap in the literature for future research studies.

Survey Question 13 involved students' preference for asynchronous course delivery. Students in the CG strongly disagreed on the presurvey that they preferred asynchronous course delivery, but they changed their mind after the course. In the postsurvey, they strongly agreed that they preferred asynchronous course delivery. The literature (Dede, 2003) only addressed the drawbacks of an asynchronous format. The researchers preferred a hybrid course format whereby both types of course delivery models are used. Students were required to participate in the VoIP sessions and were also given opportunities to respond to chat sessions in an asynchronous delivery. However, a hybrid structure may still cause students anxiety as reported by Guri-Rosenblit (2009) and Saade and Kira (2007), who indicated that use of the Internet to navigate research tools did not necessarily decrease students' anxiety.

Survey Question 15 addressed the issue of students' anxiety when initiating threaded discussions. The responses to the question on the presurvey indicated that students in the CG and EG believed they were not anxious when initiating threaded discussions. However, after the course, both the CG and EG reported they were anxious when initiating threaded discussions. Although threaded discussion was not considered a

component of the synchronous format, students reported anxiety and stress about initiating a discussion. This stress was more directed toward students' anxiety about being judged by others for their contribution in the threaded discussion board. The increase in anxiety may be due to the fact that the threaded discussion is a graded assignment that requires originality, research, and proper writing. The course required rigor in contributing to the threaded discussions.

The anxiety regarding threaded discussions that was reported by the CG on the postsurvey was supported by Bian (2009), who reported students' frustration while initiating threaded discussions because students needed specific orientation on how to use the threaded discussion board or how to respond to other students' thread initiations. In addition, students felt self-conscious when initiating threaded discussions or asking a question. According to Beaudoin et al. (2009), students were fearful of being considered unintelligent or displaying weakness in using technology properly. Since students in the EG had the experience of using the SES during the course, their level of comfort after the course might have been stronger, and these students reported they were not anxious when initiating threaded discussions.

Survey Question 17 indicated close to significance related to students' level of comfort with speaking in a VoIP web-conferencing format. Students in the CG reported they did not feel comfortable speaking using VoIP on the presurvey and postsurvey. However, the CG was not exposed to the SES, nor did they have an opportunity to use VoIP tools during the class. That might account for their responses about their comfort level. However, students in the EG reported on the presurvey that they were comfortable speaking in a VoIP format, and after the class there was an increase in their comfort level

with speaking using VoIP. Most students felt intimidated when they were asked to speak articulately about the subject while their peers were listening. It is important to note that although students were using headsets and microphones to communicate, the pressure of relaying the correct message to a group of people was intimidating for them. These results related to students' apprehension toward the use of VoIP and web-conferencing tools. The literature did not indicate intimidation of speaking among peers, except research from de los Arcos et al. (2009). De los Arcos et al. identified students' concern with being judged or giving a wrong answer during the synchronous chat. Therefore, the current study implies that students experience anxiety when speaking in an online environment among peers. Based on the finding from de los Arcos et al.'s study and the current research results, there is an indication of the need for further study in order to partially fill a gap in the literature on students' anxiety.

The current research identified other factors that contributed to students' anxiety and frustration while attending online courses. The students felt intimidated by their peers because they believed that all their classmates were judging them. Elliot and Chong (2005) acknowledged that college students are fearful of their classmates during presentations. When students in the current study spoke about other factors that contributed to their frustration and anxiety, they indicated they were uncomfortable when they had to speak in front of their peers and their instructor, possibly during live presentations. Also in the current study, students expressed their frustration in interacting with classmates through dialogue. Some students felt it was difficult to have a conversation with their peers in an online VoIP situation. Dobbs et al. (2009) noted in their study that students had difficulty with belonging in class and collaboration with

their peers. They stressed the concern that students felt a sense of isolation. This feeling of isolation was also reported by Combes and Anderson (2006). Additionally, Combes and Anderson's study revealed that students' isolation caused them to have problems with their self-concept.

The following statements provide examples of factors that affect students' frustration and anxiety related to speaking in class: "I always worry about the significant of my contribution to the class" (Student A); "I do not like to talk on the microphone" (Student B); "I do not know how voice conferences work and I am worried that I will not be able to understand and to do well on them" (Student C); "It is hard to have a dialogue between classmates, because only one person can speak at a time. If not, there is an echo or heavy feedback. Also, having everyone's attention on you, it is kind of intimidating" (Student D). Additionally, Student E expressed frustration by noting, "I do not like the concept of chatting in an online class. I preferred the standard format in online learning." Student F wrote, "Courses in general are stressful, but chat sessions make it worse because I have yet to have one that has provided me with useful information."

The SES was created as an integral system to identify how students' feelings of frustration and anxiety changed after attending an online course. Students were given an opportunity to share their experiences, acknowledging strengths and weaknesses of using the SES. Since the literature did not address any type of system, the current study contributes to the literature by specifying students' opinions regarding their use of the SES and explaining the effectiveness of the system. Therefore, the current study adds to the literature by addressing a new system that has potential for alleviating students' frustration and anxiety when they attend an online course.

Implications

The most important aspect of this study was the evaluation of the SES and how it alleviated students' stress and anxiety while attending online courses. The research showed that students' use of the SES with VoIP and web conferencing did decrease the students' frustration and anxiety overall. The results of the study indicated that students were anxious prior to the start of the course. When students received information about the course content before the course started, their anxiety decreased. Therefore, an implication of the study is that the course syllabus and related materials should be provided to students at least a week before the course starts to help lessen their anxiety. This would provide students more time to prepare for attending the online classes.

The current research indicated that exposure to a synchronous course format and SES assisted students with decreasing their level of anxiety. Therefore, the implication of the study is that all online courses must prepare students and offer SES as the introduction and prerequisite for attending online classes. Another requirement should be viewing the SES by applying it to all online courses.

Although the study found that students became less anxious and frustrated after the course was completed, the study also indicated a variation of statistical significance. Based on the inconsistencies of current data, the implication for further research is apparent. Since the current study included both control and experimental groups, additional research specific to either asynchronous or synchronous modality is warranted. Consequently, an additional study needs to be conducted whereby each model is separately tested. This study included the development of an SES tool and provided evidence that it was an effective tool for decreasing student anxiety. Although it is not

known how many times the students in the EG viewed the SES, it was still proven effective, but other factors contributed to students' decrease in anxiety. The immediate feedback from the instructor through the synchronous voice chats that comforted the students resulted in a decrease in anxiety. In some cases, students agreed that their anxiety was diminished when they were involved in collaboration on a group project. This implies that more collaboration needs to be instituted in online classes to include synchronous chats.

Addressing inconsistencies in students' responses regarding the usefulness of SES indicated that more research needs to be conducted from a qualitative perspective. If students were specifically interviewed regarding the value of SES, their responses may provide more in-depth detail of how effective and practical the SES was in helping them use synchronous tools. The qualitative process would also identify the need for a relationship with their instructor and their peers.

Recommendations

It is recommended, based on the current implications of the study, that other research be conducted on anxiety and frustration in higher education online courses. Also, further research should be conducted with students in online courses to develop and disseminate the areas separately as synchronous and asynchronous classes. For example, a study should be developed and conducted with synchronous courses only. A separate study, either quasi-experimental or full experimental, should be conducted with asynchronous courses only. It is also recommended that research be conducted at other schools in a university setting.

A further recommendation is to conduct a study on VoIP and web-conferencing security measures in a synchronous course format. Selected students should learn about various security glitches and breaches that can occur in VoIP and web-conferencing environments. Students' knowledge about security protection and the privacy of their communication is important. Therefore, the area of security should be specifically studied for future research.

Based on the success of the SES in the current study, it is recommended that all online classes have the opportunity to apply SES in the courses. In addition, it is highly recommended that full-time and adjunct faculty be given training in tools and best practices for using the SES. The SES tools need to be expanded to train all the students in various classes. Another utilization of the software that is used to create SES should be recording the lectures in video format and making them available for any courses at the university. Expanding the SES to other schools may assist students in other departments with decreasing their anxiety in attending online courses. More research needs to be conducted in this area of technology to research how SES affects students in other schools.

Summary

The purpose of this study was to investigate to what extent the use of SES as an eLearning tool or set of tools assisted graduate students with alleviating frustration and stress when attending online courses. Since the literature review acknowledged students' frustration and anxiety in attending online courses, it presented a need to examine whether the introduction of an SES would decrease graduate students' anxiety in a synchronous course format. Therefore, for this study, the SES tool was developed to

assist students in becoming acquainted with the Class LivePro web-conferencing environment in a specific university setting. The study involved a quasi-experimental design of two groups attending the same management course. Both the CG and the EG were given presurveys and postsurveys. The postsurvey for the EG contained two additional open-ended questions regarding students' experiences with the SES. Results of the study provided mixed information regarding students' anxiety about various elements in asynchronous and synchronous course modalities.

The findings of the study resulted in various implications. It seemed that students' anxiety was greater when they were initiating threaded discussions, which are used both in asynchronous and synchronous formats. Other areas of anxiety for students were discomfort and intimidation when using microphones and headsets to speak among their peers in the web-conferencing chat. The study, as a whole, supported the research from the literature in identifying the need for continued research on students' anxiety when attending online courses. The current study also partially filled the gap in the literature by examining the relationship and interaction of online students with their peers. Although the current study did not find significance in the students' relationship with their peers, it partially filled the gap of research based on students' relationship with their peers in the web-conferencing classroom. Therefore, it is important to extend this research into investigating students' communication and interaction with their peers during the web-conferencing sessions. A recommendation of the study is to conduct qualitative research on asynchronous and synchronous online courses individually. The specific interview questions might ask about the students' preferences to communicate among their cohorts as the most effective method of interaction that should take place in online teaching.

This study helped to identify specific sources of students' frustration and anxiety in attending online courses, while introducing the SES tool indicated a way of alleviating students' anxiety and frustration. There is still additional research that needs to be conducted in this area. The future research should be conducted using a qualitative methodology to investigate students' anxiety when speaking among their peers or when initiating threaded discussions in online courses.

Anxiety is prevalent for students attending online courses, regardless of whether the class is structured in an asynchronous or a synchronous course format. Students need to be introduced to their course through information prior to the beginning of the course. As indicated in the current study, any information specifying how the course is organized and what is required will help to alleviate students' anxiety and frustration.

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Appendix A

Presurvey for Experimental and Control Groups

1. Please indicate your age range:
 - a. 20-25
 - b. 26-35
 - c. 36-45
 - d. Over 45
2. Please indicate your gender:
 - a. Male
 - b. Female
3. Which program are you in?
 - a. MBA
 - b. MA
 - c. MSOL
 - d. Other: _____
4. How would you describe your computer competency?
 - a. Novice
 - b. Beginner
 - c. Intermediate
 - d. Expert
5. How many online courses have you taken?
 - a. None
 - b. 1-3
 - c. 4-6
 - d. 7 or more
6. How many synchronous voice conferencing chats have you joined?
 - a. None
 - b. 1-3
 - c. 4-6
 - d. 7 or more
7. Do you feel anxious attending voice conferencing chats during your online course?
 - a. Yes*
 - b. No
 - c. I have not taken an online course and/or I have not experienced voice conferencing chats.
8. *Please tell us why:

[OPEN-ENDED]

When answering the following questions, please refer to your experiences in online courses only.

		Strongly disagree	Disagree	Neutral	Agree	Strongly agree	N/A
9	Online classes cause me anxiety.						
10	Before starting any course, I have anxiety.						
11	Using computers and technology in online courses cause me stress.						
12	I prefer to know about course requirements before starting the course.						
13	I prefer an asynchronous (no real time chat VoIP and web conferencing) solitary course environment.						
14	I prefer synchronous (real time, web conferencing, and voice chat) course delivery.						
15	I am anxious when initiating a threaded discussion.						
16	I am anxious when responding to peers' threaded discussions.						
17	I am usually comfortable speaking in a VoIP/web conferencing session.						
18	I get intimidated about speaking among my cohorts in the class.						
19	I would be stressed if I discovered that my contributions are not secure in the web conferencing environment.						

Appendix B

Postsurvey for Experimental Group

1. Please indicate your age range:
 - a. 20-25
 - b. 26-35
 - c. 36-45
 - d. Over 45
2. Please indicate your gender:
 - a. Male
 - b. Female
3. Which program are you in?
 - a. MBA
 - b. MA
 - c. MSOL
 - d. Other: _____
4. How would you describe your computer competency?
 - a. Novice
 - b. Beginner
 - c. Intermediate
 - d. Expert
5. How many online courses have you taken?
 - a. None
 - b. 1-3
 - c. 4-6
 - d. 7 or more
6. How many synchronous voice conferencing chats have you joined?
 - a. None
 - b. 1-3
 - c. 4-6
 - d. 7 or more
7. Do you feel anxious attending voice conferencing chats during your online course?
 - a. Yes*
 - b. No
 - c. I have not taken an online course and/or I have not experienced voice conferencing chats.
8. *Please tell us why:

[OPEN-ENDED]

When answering the following questions, please refer to your experiences in online courses only.

		Strongly disagree	Disagree	Neutral	Agree	Strongly agree	N/A
9	Online classes cause me anxiety.						
10	Before starting any course, I have anxiety.						
11	Using computers and technology in online courses cause me stress.						
12	I prefer to know about course requirements before starting the course.						
13	I prefer an asynchronous (no real time chat VoIP and web conferencing) solitary course environment.						
14	I prefer synchronous (real time, web conferencing, and voice chat) course delivery.						
15	I am anxious when initiating a threaded discussion.						
16	I am anxious when responding to peers' threaded discussions.						
17	I am usually comfortable speaking in a VoIP/web conferencing session.						
18	I get intimidated about speaking among my cohorts in the class.						
19	I would be stressed if I discovered that my contributions are not secure in the web conferencing environment.						
20	My feelings about online participation have changed as a result of working with SES.						

21. What were the strengths of SES?
22. What were the weaknesses of SES?
23. Please provide any additional comments on the course delivery:

Appendix C

Postsurvey for Control Group

1. Please indicate your age range:
 - a. 20-25
 - b. 26-35
 - c. 36-45
 - d. Over 45
2. Please indicate your gender:
 - a. Male
 - b. Female
3. Which program are you in?
 - a. MBA
 - b. MA
 - c. MSOL
 - d. Other: _____
4. How would you describe your computer competency?
 - a. Novice
 - b. Beginner
 - c. Intermediate
 - d. Expert
5. How many online courses have you taken?
 - a. None
 - b. 1-3
 - c. 4-6
 - d. 7 or more
6. How many synchronous voice conferencing chats have you joined?
 - a. None
 - b. 1-3
 - c. 4-6
 - d. 7 or more
7. Do you feel anxious attending voice conferencing chats during your online course?
 - a. Yes*
 - b. No
 - c. I have not taken an online course and/or I have not experienced voice conferencing chats.
8. *Please tell us why:

[OPEN-ENDED]

When answering the following questions, please refer to your experiences in online courses.

		Strongly disagree	Disagree	Neutral	Agree	Strongly agree	N/A
9	Online classes cause me anxiety.						
10	Before starting any course, I have anxiety.						
11	Using computers and technology in online courses cause me stress.						
12	I prefer to know about course requirements before starting the course.						
13	I prefer an asynchronous (no real time chat VoIP and web conferencing) solitary course environment.						
14	I prefer synchronous (real time, web conferencing, and voice chat) course delivery.						
15	I am anxious when initiating a threaded discussion.						
16	I am anxious when responding to peers' threaded discussions.						
17	I am usually comfortable speaking in a VoIP/web conferencing session.						
18	I get intimidated about speaking among my cohorts in the class.						
19	I would be stressed if I discovered that my contributions are not secure in the web conferencing environment.						

20. Please provide any additional comments on the course delivery:

Appendix D

What is Synchronous Engagement System (SES)

Welcome to SES. This informational system is created to engage students in features of Elluminate live online web conferencing/VoIP software. The purpose of this tutorial is to help students learn how to use various features and tools that are relevant to them in synchronous chats during their MBA program. It is anticipated that an introduction to synchronous chats help students overcome their anxiety of web conferencing and VoIP chat-rooms, as well as, gather information of students' capabilities of this software. The following steps will assist students in their journey through SES and prepare them to participate effectively in real time Chats.

Sign-on to ClassLive Pro-Eluminate live

From the National University portal, choose logon option. At the logon option page choose "Online classes" option. On this page add your student ID number in addition to a password (first time users' password is the six character of individual birthday (mmddy)). Password can be changed from (my profile) in the system.

Once in the system, click on "Courses" tab which is located on the top left corner of the page. To enter the course, click on the link "here." This gives access to the list of courses and training sessions. To enter in the actual course, click on the appropriate month link and that will start eCollege course shell. Various Java applets will load on the browser in order for Elluminate live software to download into the browser.

Audio Setup Wizard

Tools » Audio » Audio Setup Wizard

Before signing on to the system, learner should plugin their headset with microphone. The computer usually tries to configure the device. To check your working device you must click on tools from the top menu, and then choose Audio Setup Wizard. This function tests the microphone and speakers of the device. This function provides a

recording and asks the learner to click on a button if the message is heard. If the learner hears the voice and also hears the recording of their recorded voice, it indicates that their headset device is configured properly. If the voice or recording has been unsuccessful, then choose tools again, this time choose, click on audio output device and choose your speaker model (listening) device from the offered list and click refresh. Also, click on the input device and choose the appropriate microphone, click refresh and save. With these modifications the headset device should be configured. To test it in the real environment, click on the gray microphone icon, in the lower left side of the class, this will allow you to speak in the class. By clicking on the microphone gray picture in the bottom left corner, the picture changes color and the also the picture of microphone in the participant box changes the color to yellow, which means that microphone is ready to be used by the participant. Things to remember about Audio Wizard is to remember, each time a participants are entering the class, they should use audio wizard to make sure that they speak and hear each other as well as check for the quality voice exchange.

White Board

Once the Elluminate live loads in the browser and you are in the class, positioned to the right is the White Board area whereby faculty and students can click on the pen and or coloring brush to write on the board. *Demonstrate.....*

Each person can write or color simultaneously on the white board. Individuals can erase their own writing. The moderator is usually a faculty member, who has the capability of erasing everyone's work on the board.

The importance of the White Board in this system works for sharing content of any type. Faculty and students can utilize the alphabet to type or pen to write or draw on the board. The tools that are located vertically next to the white board are to help learners express their ideas. Some of the important tools are; arrow (clicking on the arrow, deselects other features). Clicking on the pen, allow writing or drawing on the screen. Clicking on "A" allows for typing simple text on the white board. The eraser allows for erasing individuals work on the white board. The Highlighter provides highlight or can be used as a paint brush by choosing the color from the bottom of the white page. The other white board icon tools that are available are: adding halo and full circles, as well as rectangle. The Laser Pointer is an important tool to use during presentation to emphasize important points. The other features that can be useful for students are adding image and art clips to the white board.

Application Sharing

Tools» Application Sharing » Share » Host Applications. Or simply click on this icon from the menu.

Application sharing is a powerful tool for students and faculty. All types of documents can be shared for the whole class to view through application the sharing feature. To application share, the particular application students choose to share should be opened on the browser of the individual who wants to share his/her application. Let's share a word document; first, you open the word document that needs to be shared on the browser. The application cannot be minimized or collapsed on the Start menu bar; it should be opened as if you were going to work on the document. Then click on the tools, click on application sharing and host application. This feature can be easily accessed by clicking on the icon from the top (horizontal) menu bar. The selected application should be chosen and clicked on and not the screen sharing. The system will then portray the application. This feature is similar to taking the audience into your desktop.

File Transfer on the Fly

File transfer feature provides students with sending their power point presentation to the class moderator for upload. Power point is the only application that can be uploaded into this system. Since only faculty or the moderator has the capability to upload a power point file into the system, students may use the file transfer feature to upload their power point file and send it to the faculty, so he or she can upload it into the course. This feature is quick and takes place within the course so students do not have to use email to send their power points to their faculty member.

Webcam or video icon

Step 6--Clicking on the webcam icon allows for video transfer to start from your desktop. The Webcam feature can be used by everyone in the class, but it is not suggested at this time. Video transfer requires a major strength of the bandwidth which many times causes users' video transfer intermittently resulting in a delay in transfer. Many users network may not provide optimum bandwidth connection, so the use of the webcam feature is not recommended at this time.

Note Pad

The Notepad icon allows the student to type notes individually during class sessions. Students can take all the important notes during the lecture and save it in their own document for future reviews.

Raising hands, emotions, Yes & No polls

This small hand allows for students to raise their hand if they want to talk. It operates in a similar fashion to a FTF class, when students raise their hands. The moderator then receives a number in the raise hand column that indicates who has raised their hand first, second or third.

The second goal of the study is to understand what other factors could affect online student's anxiety. The second purpose will be to also evaluate the SES intervention after the commencing of the course, to address and acknowledge any changes in students' anxiety and satisfaction. Based on the research data gathered after the treatment, modifications may be necessary to be added for the benefit of future dissemination of the SES.

Emotion icons

Smiley face, sad face, victory and fingers down and clapping are emotional icon that allows for everyone to show their emotions regarding the immediate topic discussed. .Instead of allowing each individual to grab the microphone and provide verbal comments, the emotional icons provides immediate personal feelings feedback from everyone who uses it.

The area that identifies yes and no responses is provided through these polling icons. For example, if your answer to the lecturer specifies a quick Yes and No, make sure to click on the check mark for "yes" and X mark for "no."

The door icon is used when an individual is away from the class momentarily. If for any reason you need to leave the class, make sure to click on the door so that others know you are not there and not impose a question to you. When you are back and have your attention in the class, click on the icon which enables everyone else to know that you have returned to the class.

Text Chat

Text chat allows for texting, while in the class. Students can text each other or their instructor privately. Try to avoid text chatting for few reasons: while the instructor lectures, text chatting becomes interference, similar to students talking in the back of the classroom. It takes away from an individual's attention to the lecture. Also, since this is a VoIP class, the advantage of is to speak to each other and not text chatting.

Recordings

Every session in the course is automatically recorded. Students who miss the lecture may be able to listen to the chat recording by clicking on the recording link from the page where they enter the class. The dated links are the recordings along with minutes of that recording of the certain meeting days.

This concludes this training; we hope that the information helped you to become familiar with the web conferencing/VoIP chat environment.

Appendix E

Snapshots of Modules

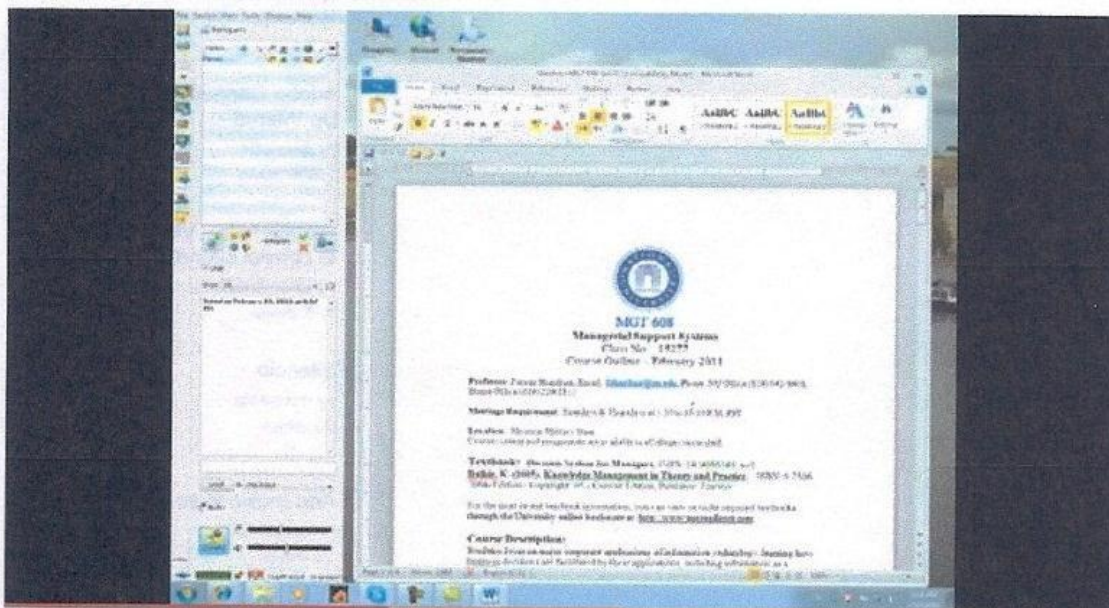
Introduction
fsharifrazi 0 videos [Subscribe](#)



The screenshot displays a video player interface. At the top, the video title is 'Introduction' by 'fsharifrazi' with '0 videos' and a 'Subscribe' button. The main content is a screenshot of the National University website. The website has a dark blue header with the university's logo and name. Below the header is a navigation menu with links for 'Our Mission', 'Our Programs', 'Admissions', 'Online Education', 'Locations', and 'Contact Us'. A search bar is located on the right side of the header. The main body of the website features a 'Login' section with three columns of links: 'For Students' (Online Classes, SGAR Student Portal, Knowledge Base, JALFAST, SGAR), 'For Faculty' (Faculty Online Course Login, Mail to Admin Faculty, Faculty SGAR Portal, Systems Faculty SGAR Login, Enroll, JALFAST, SGAR, COUNNET, ADS, Digital Measures), and 'For Staff' (Travel/Event Center Login, SGAR Login, Email, Knowledge Base, MJ-FAST, Centers/NET, SharePoint). A video feed of a woman is visible in the bottom right corner of the player. The video player controls at the bottom show a play button, a progress bar at 0:49 / 5:06, and a resolution of 360p.

Application Sharing

fsharifrazi 0 videos [Subscribe](#)

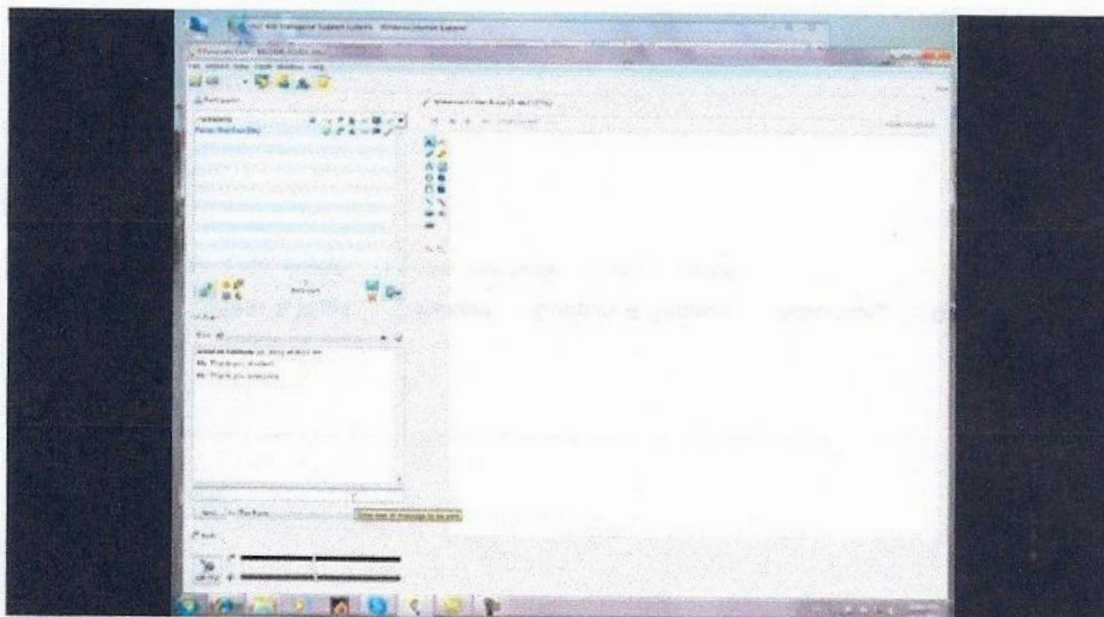


2:26 / 7:12

360p

Emotional icons and text chatting

fsharifrazi 0 videos [Subscribe](#)



5:42 / 7:45

360p

Emotional icons and text chatting

fsharifrazi 0 videos [Subscribe](#)

The screenshot shows a web browser displaying the National University website. The page features a navigation menu on the left and a main content area with a table of courses. The video player interface at the bottom indicates the video is at 6:18 out of 7:45 minutes and is playing at 360p resolution.

Course ID	Course Title	Credits	Status
ENGL101	English 101	3	Open
ENGL102	English 102	3	Open
ENGL103	English 103	3	Open
ENGL104	English 104	3	Open
ENGL105	English 105	3	Open
ENGL106	English 106	3	Open
ENGL107	English 107	3	Open
ENGL108	English 108	3	Open
ENGL109	English 109	3	Open
ENGL110	English 110	3	Open
ENGL111	English 111	3	Open
ENGL112	English 112	3	Open
ENGL113	English 113	3	Open
ENGL114	English 114	3	Open
ENGL115	English 115	3	Open
ENGL116	English 116	3	Open
ENGL117	English 117	3	Open
ENGL118	English 118	3	Open
ENGL119	English 119	3	Open
ENGL120	English 120	3	Open

Appendix F

Institutional Review Board (IRB) Study Approval



MEMORANDUM

To: Famaz Sharifrazi, M.S.

From: Ana I. Fins, Ph.D.
Chair, Institutional Review Board *Ana I. Fins*
Signature

Date: November 21, 2011

Re: The Investigation of a Synchronous Engagement System (SES) to Alleviate Anxiety Among eLearning Students in an MBA Program (Protocol No.: Fins 2011-13)

I have reviewed the above-referenced research protocol at the center level. Based on the information provided, I have determined that this study is exempt from further IRB review. You may proceed with your study as described to the IRB. As principal investigator, you must adhere to the following requirements:

- 1) **CONSENT:** If recruitment procedures include consent forms these must be obtained in such a manner that they are clearly understood by the subjects and the process affords subjects the opportunity to ask questions, obtain detailed answers from those directly involved in the research, and have sufficient time to consider their participation after they have been provided this information. The subjects must be given a copy of the signed consent document, and a copy must be placed in a secure file separate from de-identified participant information. Record of informed consent must be retained for a minimum of three years from the conclusion of the study.
- 2) **ADVERSE EVENTS/UNANTICIPATED PROBLEMS:** The principal investigator is required to notify the IRB chair (954-262-5369) of any adverse reactions or unanticipated events that may develop as a result of this study. Reactions or events may include, but are not limited to, injury, depression as a result of participation in the study, life-threatening situation, death, or loss of confidentiality/anonymity of subject. Approval may be withdrawn if the problem is serious.
- 3) **AMENDMENTS:** Any changes in the study (e.g., procedures, number or types of subjects, consent forms, investigators, etc.) must be approved by the IRB prior to implementation. Please be advised that changes in a study may require further review depending on the nature of the change. Please contact me with any questions regarding amendments or changes to your study.

The NSU IRB is in compliance with the requirements for the protection of human subjects prescribed in Part 46 of Title 45 of the Code of Federal Regulations (45 CFR 46) revised June 18, 1991.

Cc: Protocol File

Invitation Email for Control Group

Dear Learners:

The risks associated with this study are minimal. There may be a loss of confidentiality. To reduce the risk you will be assigned a random number that will be linked to your email so that we can match your responses from the first and second survey. The coding list that links the random number to the email will be stored securely through OIRA. The information on these surveys will be kept protected and be kept confidential through OIRA for three years after the study ends, and at that time the data will be destroyed.

The post survey will be sent to you after the course ends. An email in the form of post-survey reminder will be sent to you on the last day of the course with the link embedded to click and take the post-survey.

The surveys will ask about your experiences related to anxiety and/or frustration in attending online university classes. Also, note that your identity and your answers are kept confidential.

Below there are information provided as the form of questions and answers that explains the steps and your right as the participant in this survey.

INFORMATION ABOUT: The Investigation of a Synchronous Engagement System (SES) to Alleviate Anxiety among eLearning Students in an MBA Program

RESPONSIBLE INVESTIGATOR: Farnaz Sharifrazi, fsharifrazi@nu.edu, 858-642-8468.

Under the direction of Dr. Mary Hazard mhazard@nu.edu, 858-642-8361 and Mr. Michael Slatoff mflatoff@nu.edu, 858-642-8645 at the Office of Internal Review and Assessment (OIRA) at the National University you are invited to participate in the surveys that will be conducted at your MGT 608 class.

WHAT IS THE STUDY ABOUT?

The main goal of this study is to investigate to what extent students have frustration and stress attending online courses. Students' frustration and anxiety will be examined through pre-course and post-course surveys. Based on the literature there are evidence of students' anxiety and frustration in an online course environment. Therefore this study will be used to elicit general feelings and behaviors in students experience when taking online courses. The study is designed to assist alleviate students' anxiety and stress before and during the online courses.

WHAT DOES PARTICIPATION IN THIS RESEARCH STUDY INVOLVE?

It involves about 10 minutes of your time, which includes taking two surveys. Before the start of your course you are expected to click on the survey link below and take the pre-survey. At the end of the course, you will receive another email with the post-survey attached. The questions in the surveys are related to your experience, feelings and frustration in online courses. Your answers will be kept confidential and secure. If you have questions about the research, your

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IRB Exempt

IRB Exempt

Date: Feb 11/21/11

Protocol # GIS 2011-13

research rights, or if you experience an injury because of the research please contact Dr. Mary Hazard mhazard@nu.edu, 858-642-8361. In addition, questions can be forwarded to Nova Southeastern IRB office at irb@nova.edu, 954-262-5311. You may contact the IRB offices at either university with questions about your research rights.

WHY AM I BEING ASKED TO PARTICIPATE?

You are asked to participate as part of a group of 60 students from MBA class, because you have experience in the area of online and onsite learning. You have the information to share the circumstances that involve your anxiety and frustration in attending either online or onsite classes. I am looking for perspectives on students' frustration in attending online course format in an MBA program.

WHAT ARE THE RISKS INVOLVED IN THIS STUDY?

The risks associated with this study are minimal. There may be a loss of confidentiality. To reduce the risk you will be assigned a random number that will be linked to your email so that we can match your responses from the first and second survey. The coding list that links the random number to the email will be stored securely through OIRA. The information on these surveys will be kept protected and be kept confidential through OIRA for three years after the study ends, and after that time the data will be destroyed.

If you have any questions regarding this study, please feel free to contact:
Dr. Mary Hazard at mhazard@nu.edu, 858-642-8361 at National University. You may also contact irb@nova.edu, 954-262-5311 at Nova Southeastern University if you have any questions about this study.

WHAT ARE THE POSSIBLE BENEFITS IN THIS STUDY?

There are no direct benefits for participating in this study.

WILL IT COST ANYTHING TO PARTICIPATE IN THE STUDY? WILL I GET PAID TO PARTICIPATE?

There are no costs to you or payments made for participating in this study.

WHAT HAPPENS IF THE RESEARCHER GETS NEW INFORMATION DURING THE STUDY?

The researcher will contact you if the researcher learns new information that could change your decision about participating in this study.

WILL MY PARTICIPATION BE CONFIDENTIAL?

"All information obtained in this study is strictly confidential unless disclosure is required by law." The only individuals who may review these data are; IRB representative, regulatory agencies, this dissertation chair and advisor. Your information will be kept confidential by the

Page 2 of 4

IRB Exempt

Date: 11/21/11

Protocol # 615 2011-13

OIRA and will not be disclosed to anyone other than the above responsible individuals for this study. Since your survey responses are received via email, your email address will not be compromised.

WHAT HAPPENS IF I DO NOT WANT TO CONTINUE IN THE STUDY?

Your participation is voluntary and you have the right to withdraw from this study at any time or refuse to participate without adverse effects or grade deductions. If you choose to withdraw in the middle of the study, any information collected about you **before** the date you leave the study will be kept in the research records for 36 months from the conclusion of the study and may be used as a part of the research.

WILL PARTICIPANTS BE COMPENSATED FOR ILLNESS OR INJURY?

You are not waiving any of your legal rights if you agree to participate in this study. But no funds have been set aside to compensate you in the event of injury. If you suffer harm because you participated in this research project, you may write or call the Office of the Institutional Review Board, National University, 11255 North Torrey Pines Road, La Jolla, CA 92037; Telephone (858) 642-8136.

WHAT HAPPENS WITH THE DATA WHEN YOU ARE FINISHED?

In order to comply with federal regulations of secured data storage, National University IRB Policy requires that records shall be retained for at least 3 years, and records relating to research which is conducted shall be retained for at least 3 years after completion of the research. All records shall be accessible for inspection and copying by authorized representatives of the department or agency at reasonable times and in a reasonable manner.

By taking the survey you agree to participate in the study. Should you have any questions about the study please contact the principal investigator Farnaz Sharifrazi either by email at fsharifrazi@nu.edu, or phone 858-642-8468, before you start the survey. Thank you for your participation. Your feedback is very valuable.

Sincerely,

Office of the Internal Review and Assessment (OIRA)

IRB Exempt

Date: 11/21/11

Protocol # IRB 2011-13

Page 3 of 4

APPENDIX- A: Email for Experimental Group

Dear Learners:

Your class MGT 608 is selected for this educational enhancement study. As part of this study, there will be two surveys; a pre-survey and a post survey and two chats per week, two hours each time. You have the right to choose to participate or not to participate in this study. If you choose to participate, please print the attached consent form, add your name and signature and send it to: National University, Office of the Internal Review and Assessment (OIRA), 11255 N. Torrey Pines Rd. La Jolla, CA 92037. By signing the consent form you agree to participate in the study. After receiving your signed consent form, the OIRA representative will send the pre-survey to those who return the signed consent form.

You should fill out the pre-survey before the class begins and before viewing of Student Engagement System (SES). The SES link will be provided through the survey email when the signed consent has been received. The post survey will be sent after the course ends. You will receive an email reminder with the link to take the post-survey.

The survey will ask about your experiences related to anxiety and/or frustration in attending online university classes. In addition to the survey, the attached document to this email is the consent form for your participation in the study. Although, the letter of consent will explain the process, it is important to inform you that your answers will be kept confidential and your identity will be protected. Please keep a copy of the signed form for your record. Should you have any questions about the study please contact the principal investigator; Farnaz Sharifrazi either by email at fsharifrazi@nu.edu, or phone 858-642-8468, before signing the consent form. Thank you very much for participating. Your feedback is very valuable.

Sincerely,
Office of Internal Review and Assessment (OIRA)

IRB Exempt
Date: 11/21/11
Protocol # 1108 2011-13

PI: **Farnaz Sharifrazi**
Version Date: **November, 1, 2011**
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Informed Consent Form

The Investigation of a Synchronous Engagement System (SES) to Alleviate Anxiety among eLearning Students in an MBA Program

Dear Students:

You are invited to participate in a pre and post survey in your MGT 608 course. Detailed information about the study can be found in the following pages of the consent form. By signing and sending the consent form to the Office of Information and Assessment (OIRA) at National University, 11255 N. Torrey Pines, La Jolla, CA 92037, you will accept participation in this study. Upon receiving your signed consent form OIRA will send you an email with the survey link for your participation to the study. For your record, you will receive a copy of your signed consent form via U.S. Mail to your address on-file.

If you have any questions about the study please contact the principal investigator (PI) for this study; Farnaz Sharifrazi either by email at fsharifrazi@nu.edu, or phone 858-642-8468, before you start the survey.

Thank you for your participation.

IRB Exempt

Date: 11/21/11

Protocol # IRB 2011-13

Initials: _____ Date: _____

Page 1 of 5



INFORMED CONSENT FORM

INFORMATION ABOUT: The Investigation of a Synchronous Engagement System (SES) to Alleviate Anxiety among eLearning Students in an MBA Program

RESPONSIBLE INVESTIGATOR: Farnaz Sharifrazi, fsharifrazi@nu.edu

Under the direction of Dr. Mary Hazard mhazard@nu.edu, 858-642-8361 and Mr. Michael Slatoff mflatoff@nu.edu, 858-642-8645 at the Office of Internal Review and Assessment at the National University and Nova Southeastern IRB office at irb@nova.edu, 954-262-5311 you are invited to participate in the surveys that will be conducted at your MGT 608 class.

CONSENT TO PARTICIPATE: The main purpose of this form is to provide information that may affect your decision about whether or not you want to participate in this research project. If you choose to participate, please sign in the space at the end of this form to record your consent and make a copy for yourself. Mail the original signed copy to National University -OIRA, 11255 N. Torrey Pines, La Jolla, CA 92037.

What is the study about?

The main goal of this study is to investigate to what extent students have frustration and stress attending online courses. Students' frustration and anxiety will be examined through pre-course and post-course surveys. Based on the literature there are evidence of students' anxiety and frustration in an online course environment. Therefore this study will be used to elicit general feelings and behaviors in students experience when taking online courses. The study is designed to assist alleviate students' anxiety and stress before and during the online courses.

WHAT DOES PARTICIPATION IN THIS RESEARCH STUDY INVOLVE?

It involves about 40 minutes of your time, which includes 10 minutes to take the surveys and 30 minutes to watch the video. Also, you are required to participate in two weekly chats a week approximately two hours for each chat, totaling four hours a week synchronous time a week. To participate you are required to sign the consent form in the Voluntary Consent section and send it to OIRA in the above address. Then an email with the pre-survey attached and the SES (Synchronous Engagement System) link will be sent to you. During the course, you will participate in an online synchronous chat format and will have the SES for your reference. If you choose not to participate in the study, you will be exempt from joining the synchronous chats. There will be no discussion about exams, assignments and points which may jeopardize your grade. At the end of the course, you will receive another email with the post-survey attached. The questions in the surveys are related to your experience, feelings and frustration in online courses. Your answers will be kept confidential and secure. If you have questions about the research, your research rights, or if you experience an injury because of the research please contact Dr. Mary Hazard mhazard@nu.edu, 858-642-8361. Questions can also be forward to Nova

Initials: _____ Date: _____

Page 2 of 5

IRB Exempt
Date: 11/21/11
Protocol # FAS 2011-13



Southeastern IRB office at irb@nova.edu, 954-262-5311. You may contact the IRB offices at either university with questions about your research rights.

WHY AM I BEING ASKED TO PARTICIPATE?

You are asked to participate as part of a group of 60 students from MBA class, because you have experience in the area of online and onsite learning. You have the information to share the circumstances that involve your anxiety and frustration in attending either online or onsite classes. I am looking for perspectives on students' frustration in attending online course format in an MBA program.

WHAT ARE THE RISKS INVOLVED IN THIS STUDY?

There will be minimal risks or discomfort in the study the risk may be the time that it will take you to answer the questions, review the videos and join the live chats. There may be a loss of confidentiality. To reduce the risk you will be assigned a random number that will be linked to your email so that we can match your responses from the first and second survey. The coding list that links the random number to the email will be stored securely through OIRA. The information on these surveys will be kept protected and be kept confidential through OIRA for three years after the study ends, and after that time the data will be destroyed."

If you have any questions regarding this study, please feel free to contact Dr. Mary Hazard at mhazard@nu.edu, 858-642-8361 at National University. Questions can be forward it to Nova Southeastern IRB office at irb@nova.edu, 954-262-5311.

WHAT ARE THE POSSIBLE BENEFITS IN THIS STUDY?

There is no direct benefit for participating in the study. Students will receive SES intervention. The benefit will involve their familiarity with online web conferencing tool for live chats. The benefit of learning these tools prior to participation in the live chat may decrease students' anxiety and frustration joining online synchronous chat classes.

WILL IT COST ANYTHING TO PARTICIPATE IN THE STUDY? WILL I GET PAID TO PARTICIPATE?

There are no costs to you or payments made for participating in this study.

WHAT HAPPENS IF THE RESEARCHER GETS NEW INFORMATION DURING THE STUDY?

The researcher will contact you if the researcher learns new information that could change your decision about participating in this study.

WILL MY PARTICIPATION BE CONFIDENTIAL?

All information obtained in this study is strictly confidential unless disclosure is required by law." The only individuals who may review these data are; IRB representative, regulatory agencies, this dissertation chair and advisor. Your information will be kept confidential by the OIRA and will not be disclosed to anyone other than the above responsible individual for this

Initials: _____ Date: _____

IRB Exempt
Date: 11/21/14
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study. Your real names will not be used anywhere; instead, you will be identified by a random number which can be matched at the end of the study to connect the pre-survey to the post-survey for number of people who participated in both surveys.

WHAT HAPPENS IF I DO NOT WANT TO CONTINUE IN THE STUDY?

Your participation is voluntary and you have the right to withdraw from this study at any time or refuse to participate without adverse effects or grade deductions. If you choose to withdraw, any information collected about you **before** the date you leave the study will be kept in the research records for 36 months from the conclusion of the study and may be used as a part of the research.”

WILL PARTICIPANTS BE COMPENSATED FOR ILLNESS OR INJURY?

You are not waiving any of your legal rights if you agree to participate in this study. But no funds have been set aside to compensate you in the event of injury. If you suffer harm because you participated in this research project, you may write or call the Office of the Institutional Review Board, National University, 11255 North Torrey Pines Road, La Jolla, CA 92037; Telephone (858) 642-8136.

WHAT HAPPENS WITH THE DATA WHEN YOU ARE FINISHED?

In order to comply with federal regulations of secured data storage, National University IRB Policy requires that records shall be retained for at least 3 years, and records relating to research which is conducted shall be retained for at least 3 years after completion of the research. All records shall be accessible for inspection and copying by authorized representatives of the department or agency at reasonable times and in a reasonable manner.

VOLUNTARY CONSENT

By signing this form, you are saying (1) that you have read this form or have had it read to you and (2) that you understand this form, the research study, and its risks and benefits. The researcher will be happy to answer any questions you have about the research. If you have any questions, please feel free to contact Dr. Mary Hazard at mhazard@nu.edu, phone: 858-642-8136 at National University. Questions can be also forwarded to Nova Southeastern IRB office at irb@nova.edu, 954-262-5311.

If at any time you feel pressured to participate or if you have any questions about your rights or this form, please call the Office of the Institutional Review Board at (858) 642-8136.

Note: By signing below, you are telling the researcher "Yes" you want to participate in this study. Please keep one copy of this form for your records.

Your Name (please print): _____

Your Signature: _____ Date: _____

Initials: _____ Date: _____ Page 4 of 5

IRB Exempt
Date: 11/24/14
Protocol # 12052011-13



INVESTIGATOR'S STATEMENT

I certify that this form includes all information concerning the study relevant to the protection of the rights of the participants, including the nature and purpose of this research, benefits, risks, costs, and any experimental procedures.

I have described the rights and protections afforded to human research participants and have done nothing to pressure, coerce, or falsely entice this person to participate. I am available to answer the participant's questions and have encouraged him or her to ask additional questions at any time during the course of the study.

Principal Investigator Name (please print): Farnaz Sharifrazi

Principal Investigator Signature: _____ Date: 11/16/2011

Initials: _____ Date: _____

IRB Exempt
Date: 11/21/11
Protocol # 2011-13

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