Student and Faculty Perceptions: The Impact of Synchronous Online Software as an Interactive Tool in a Web-Based College Course

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Student and Faculty Perceptions: The Impact of Synchronous Online Software as an Interactive Tool in a Web-Based College Course

by
Natolyn Jones-Ferguson

An Applied Dissertation Submitted to the Abraham S. Fischler School of Education in Partial Fulfillment of the Requirements for the Degree of Doctor of Education

Nova Southeastern University
Approval Page

This applied dissertation was submitted by Natolyn Jones-Ferguson under the direction of the persons listed below. It was submitted to the Abraham S. Fischler School of Education and approved in partial fulfillment of the requirements for the degree of Doctor of Education at Nova Southeastern University.

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Abstract

Student and Faculty Perceptions: The Impact of Synchronous Online Software as an Interactive Tool in a Web-Based College Course. Natolyn Jones-Ferguson, 2012: Applied Dissertation, Nova Southeastern University, Abraham S. Fischler School of Education. ERIC Descriptors: Distance Education, Synchronous Communication, Online Courses, Interaction, Dialogue

This applied dissertation was designed to provide current information for college administrators and instructors on the use of synchronous technology in online courses—a growing area in higher education. The focus of this analysis was on student and instructor perspectives regarding experiences with synchronous technology in the online classroom setting. The researcher used surveys and interviews to glean data related to accessibility and efficiency of online learning technology, communication; instructional content, information and strategies; aspects of instructional delivery; technical support; and overall impressions. Results revealed that students are satisfied with synchronous technology in their online classes. Instructors use the synchronous web-based computer system tool as a part their instructional strategy and to enhance dialogue and interaction. However, there are technical issues that can present challenges.

The findings can be used by higher education leaders to address concerns about student and instructional experiences in a non-traditional environment. Instructors are being encouraged to include synchronous activities as a part of their curriculum. The study provides an opportunity to assess and determine what works or needs improvement. Students and instructors must have the appropriate skills to navigate the technological revolution that continues to change the dynamics of the collegiate experience in the virtual classroom. It is recommended that instructors receive detailed training that will greatly enhance satisfaction and comfort levels. Not only does the instructor need the technological skills, but the ability to engage students. Students who feel a sense of community and engagement will remain active and are less likely to drop out.
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Chapter 1: Introduction

Statement of the Problem

The sophistication of synchronous technology has contributed to advances in online course delivery. As colleges compete to meet the demands of a technologically driven society, leaders must carefully examine any tendencies to overinvest in technologies that are not beneficial to the student or the instructor or the stability of the institution. The researcher’s university has been a leader and innovator in the development and delivery of distance education. However, the problem is that the university has not conducted a detailed analysis of student and instructor attitudes about, and perceptions of, synchronous technology. Such a study could determine whether resources are effectively deployed and utilized wisely.

Distance education. Distance education began in the 1870s with correspondence courses and continued as a component of adult education for more than 100 years. As new educational delivery systems have been initiated over the past three decades, correspondence courses are no longer the only option for students seeking off-campus instruction. Distance education now consists of CD-ROM, computer conferencing, and web-based/online courses (Moore & Kearsley, 2005). The scope of this research study will be limited to the online aspect of this phenomenon. The terms distance education, web-based, and online will be used interchangeably throughout this dissertation.

Other terms used to describe distance education are synchronous and asynchronous. Synchronous is real-time communication similar to the traditional face-to-face classroom, videoconferencing, and chat rooms. One popular synchronous product used by a number of colleges and universities is Elluminate Live. It is a web-based
audioconferencing software package that enables instructors to have real-time discussions with and immediate responses to students, and can be supported by PowerPoint slides, web sites, whiteboard mark-up capability, and shared applications (Schullo et al., 2005; Skylar, 2009). A unique feature of Elluminate Live is the ability to listen to recorded sessions at any time. In an asynchronous environment, students respond to each other according to their own schedules using a flexible format at any time and place. Examples of this format are threaded discussion boards, email, and CD-ROM (Moore & Kearsley, 2005).

According to the National Center for Educational Statistics (2008), about 66% of the 4,160 2-year and 4-year degree-granting postsecondary institutions in the nation offer college-level distance education courses. Of the enrollees in distance education courses, 78% were in online courses, 12% were in hybrid/blended online courses, and 10% were engaged in other types of distance education. In the 21st century, distance education is not simply the addition of technology to instruction; instead, it uses technology where appropriate and creates new approaches to the teaching and learning process. It encourages students to be self-directed learners and transforms instructors from “sage on the stage” to “guide on the side” (Mazzolini & Maddison, 2003, p. 238).

**The research problem.** Technology has allowed universities and colleges to move forward by leaps and bounds by (a) expanding educational opportunities to students who must juggle family and work; (b) broadening the capacity of institutions to include new subjects areas; and (c) providing a cost effective mechanism for the university or college (Moore & Anderson, 2003). However, there are other relevant issues that need to be addressed. In all educational settings, there must be some interaction between teacher
and student. In the online environment, for instance, students and teachers are in different places during the time that they are engaged in the classroom experience and, therefore, communication has to flow through a different medium, whether it is recorded or interactive. Universities have responded by adding advanced digital technologies to enhance the interaction between student and instructor in synchronous formats.

Chat rooms and Elluminate Live are two of the major tools that have been implemented because of the increased demand for online courses and programs (Corry & Tu, 2003; Moore & Anderson, 2003). Instructors are continuously using synchronous environments to deal with the lack of interaction and to enhance dialogue in online college courses. More empirical research on synchronous learning is needed to address instructor and student experiences that move beyond the flexible nature of the asynchronous learning environment.

**Background and justification.** Distance education is not a new phenomenon and there has been some theoretical development in its history. One of the most prominent is the theory of transactional distance developed by Moore (1997), who observed that pedagogical relationships in distance education are established through strategies that differ from those in traditional classrooms. Specifically,

> [t]he family of instructional methods in which the teaching behaviors are executed apart from the learning behaviors, including those that are in contiguous teaching that would be performed in the learner’s presence, so that communication between the teacher and the learner must be facilitated by print, electronic, mechanical, or other devices. The theory of transactional distance consists of three elements regarding all distance education programs: dialogue, structure, and learner autonomy (p. 76).

Dialogue is the extent that teachers and learners interact with each other. Structure is the responsiveness of an educational program to the learner’s needs in the form of class
organization, delivery, and presentation; learner autonomy is the extent that students make decisions about their own learning and “construct their own knowledge based on their own experience” (Moore & Kearsley, p. 204). Furthermore, this theory proposed that transactional distance decreases when dialogue increases and structure decreases, and when structure increases transactional distance also increases, but dialogue decreases. The inclusion of discussion-based message boards, chat rooms, and Elluminate Live address the dialogue and communication gaps for instructor-student or student-student interaction that is inherent in this theory. However, important questions must be asked and explored. Do these technologies impact student learning? What are student and instructor perceptions of functionality and usability of the technologies? What about instructor and pedagogical considerations?

The theory has served as a framework for some distance education researchers for the past 10 years (Bender, 2003; Maddux, Ewing-Taylor, & Johnson, 2002; Moore & Anderson, 2003; Schullo, 2005; Stewart, 2008). Jung (2001) analyzed teaching and learning processes of web-based instruction (WBI) as a theoretical framework using the transactional distance theory as a tool to the understanding of “essential pedagogical components of WBI” (p. 525). Shannon (2002) utilized the transactional theory to explore effective teacher behaviors. Chen (2001) explored dimensions of transactional distance in the World Wide Web using factor analysis. The combination of technology and growing demand for distance education opportunities are changing the way universities and colleges conduct business.

Online learning presents a paradigm shift from the traditional face-to-face classroom in education. The future of higher education rests on its ability to provide
quality learning experiences in both environments. As colleges compete to maintain enrollment and meet the demands of a changing society, systematic assessment has become critical in determining what is and is not working (Newman, Couturier, & Scurry, 2004). Assessments reveal the usefulness of investing in expensive technologies or if there is a justification for something new (Maddux, Ewing-Taylor, & Johnson, 2002; Moore & Kearsley, 2005; Peters, 2003).

**Deficiencies in the evidence.** Deficiencies in the evidence reveal a need for studies that measure the real-time online experiences of students (Grant & Cheon, 2007; Groen, Tworek, & Soos-Gonczol, 2008; Karabulut & Correia, 2008; Schullo, 2005; Skylar, 2009; Stewart, 2008; Wang, 2008). Over the years, synchronous tools have been developed and implemented into the online course framework. The tools are designed to be a replica of a traditional face-to-face classroom. Distance education researchers have explored the tools used to address interaction in the online environment.

However, much of the research has focused on asynchronous tools (Bender, 2003; Chen, 2001; Cobb, 2009; Corry & Tu, 2003; Dringus, Snyder, & Terrell, 2010; Garrison, Anderson, & Archer, 2000; Lester & Perini, 2010; Northrup, Lee & Burgess, 2002; Rovai, 2001; Russo & Campbell, 2004; Wyatt, 2005). While some researchers have examined synchronous tools (Bernard, Abrami, Wade, Borokhovski & Lou, 2004; Boora et al., 2005; Cao, Griffin, & Bai, 2009; Doggett, 2008; Knipe & Lee, 2002; Schullo, 2005; Stewart, 2008), there is a need for more detailed studies in a variety of college and university settings that address instructor and student views regarding the use of enhanced technology in the collegiate online classroom. Perspectives will help determine the benefits and address issues regarding distance education for the higher education
community as it grapples with a changing student population amid technological advances.

**Audience.** This study is designed to reach courseware developers, university administrators, instructional designers, instructors, students, and others who are interested in synchronous technology and how it is used in the online classroom setting. The potential benefits could include new methods that college and university officials can use to judge which tools are the most appropriate for distance education and how such tools can be effectively utilized for students and faculty.

**Definition of Terms**

**Asynchronous learning.** A teaching method that uses online learning resources to facilitate information sharing outside the constraints of time and place among a network of people (Bernard, et al., 2004). Learning is supported through email, threaded discussion boards, wikis, and blogs.

**Blackboard.** A web-based learning system that offers customized course management. It is used by 70% of U.S. colleges and universities. Additionally, it includes over 12 million users in over 60 countries (Bradford, Porciello, Balkon, & Backus, 2007).

**Dialogue.** This term is best described as a combination of words, actions, and ideas that occurs between the instructor and learner (Stewart, 2005).

**Distance education.** Learning and communication that occur in a different place and time, requiring special course design and instruction techniques, communication through various technologies, and special organizational and administrative agreements (Moore & Kearsley, 2005, p. 2). For the purpose of this study, distance education is defined as web-based or on the Internet.
E-learning. Instructional content or learning experience delivered or enabled by electronic technologies (Jochems, Van Merrienboer, & Koper, 2004).

Elluminate Live. A web-conferencing tool that integrates teleconferencing, public and private chat, emoticons, and a webcam tool. Emoticons can be described as little pictures that relate to an emotion (such as smile=😊 or frown=🙁). There are other visual tools including a whiteboard and file transfer. The moderator can upload presentations on the whiteboard to be viewed by the audience. Additionally, the moderator can record sessions or classes for future viewing (Karabulut & Correia, 2008).

Learning Management System (LMS). An online learning system which allows for the integration of interdependent components of education such as content, records, assessment and discourse (Smith, 2004).

Social presence. The interaction between feeling, perception, and reaction within a computer-mediated learning environment (Cobb, 2009; Schullo, 2005).

Synchronous learning. A learning experience that occurs in real-time. For example, instructors and students can interact in a web-based system using technological tools that create a live environment (Wang, 2008).

Synchronous technology. Refers to software tools that are designed to create real-time, live interactions in an online environment. Features include video and audio chat, text, and applications (Karabulut & Correia, 2008; Wang, 2008).


Transactional distance. The gap of understanding and communication between
the teachers and learners caused by geographic distance that must be bridged through distinctive procedures in instructional design and the facilitation of interaction (Moore & Kearsley, 2005, p. 223).

**Purpose of the Study**

Universities and colleges continue to address student needs through the implementation of learning tools designed to enhance interaction in the online environment. There has been a dearth of research concerning student and instructor perceptions of synchronous technology. The purpose of the study is to assess student and faculty views regarding the effectiveness of an interactive, synchronous tool (Elluminate) on the online college classroom experience. In the current study, effectiveness will be defined in terms of student and instructor perceptions of the tool.
Chapter 2: Literature Review

Introduction

Distance education has been described as the fastest growing area of education internationally (Boyle, Kwon, Ross, & Simpson, 2010). Its development has occurred over the centuries. Technology has become a part of modern life and students are now utilizing a number of available course delivery options. Many students are choosing Web-based courses that provide anytime, anyplace education. Thus, instructors are expected to be knowledgeable and have the ability to integrate technologies into the classroom experience.

In the fall of 2009, colleges in the United States reported enrollment in online courses at 5.6 million, the highest rate ever (Kaya, 2010). From a global perspective, universities and colleges from other nations are expanding to compete and foster coordination among their respective institutions. The intercollegiate global classroom system is a part of the Global Knowledge Network, which is based in Australia and serves as an avenue for officials at international institutions to provide distance opportunities (Lin-Liu, 2002). However, as programs expand, officials are grappling with complex quality and administrative issues.

There are some commonalities and differences among the various institutions. Nevertheless, questions loom about distance education and its future. An understanding of how distance education continues to have an impact on modern society requires a review of existing literature. In this chapter, an examination of literature will focus on learning and distance education theories, history, attrition and persistence, and online teaching.
Learning and Distance Education Theories

In the current study, a variety of theories and concepts will be explored in relation to the evolution of distance education and the use of technology. It is essential to include educational theories that have served as a foundation for modern-day learning strategies and practice. In the field of education, learning is described as a process that brings together cognitive, emotional, and environmental influences and experiences for acquiring, enhancing, or making changes in one's knowledge, skills, values, and world views (Illeris, 2003). Learning theory is an attempt to explore and describe what happens as the learning takes place. There are two values attributed to learning theories. The first one is in providing vocabulary and a conceptual framework while interpreting observations (Ertmer & Newby, 1993; Illeris, 2003). The other suggests where to look for solutions for practical problems. The theory does not provide a solution, but serves as a guide of where to direct attention (Ertmer & Newby, 1993; Illeris, 2003).

The basis of constructivism focuses on how individuals construct their own knowledge while interacting with the world. Constructivists believe that learning must be interactive, active, relevant, and learner-oriented (Alonso, Lopez, Manrique, & Vines, 2008; Cao, Griffin, & Bai, 2009; Ertmer & Newby, 1993). Constructivism argues that humans make meaning of their learning experiences. In essence, learning is internalized and the learner is considered a unique individual. Learners are encouraged to explore their own truth based upon their own culture, background, and worldview. The learner has responsibility for his or her own learning (Alonso et al., 2008).

Learning theories have evolved with the increase of non-traditional student populations and technology. The theory of andragogy was espoused by Knowles as a
dichotomy to the education of children, also known as pedagogy. It is based on four assumptions about the adult learner: (a) adults are more self-directed as a result of their maturity, (b) adults possess personal histories that define their identities and serve as a resource of experiential learning upon which new learning can be applied, (c) readiness in adults is directed to more socially relevant learning, (d) adult learners have interest in immediate application for problem solving, and (e) as adults mature, the motivation to learn is internal (Knowles, 1980). In the early years of Knowles’ theory, educational researchers questioned whether andragogy is a theory of learning or good practice and technique. Researchers challenged the existence of distinct differences between childhood and adult learning (Roberts, 2007). As a result, Knowles altered his position on andragogy and pedagogy as a continuum in the learning cycle rather than a dichotomy between the two. Like constructivism, the andragogical model recognizes the importance of individual experience on the learning process.

Distance education brings another paradigm shift beyond the face-to-face classroom and contributes to the bewildering nature of learning. Distance education theorists have focused on defining its characteristics and how to distinguish from other forms of education. Distance education theory has been categorized into two areas: centrality of the learner and structure. Moore (1997), Moore & Anderson (2003), Holmberg (1995), and Wedemeyer (1982) focused on the independence of the learner and believed that real learning is primarily an individual activity attained only through an internalizing process. Additionally, Wedemeyer believed that such independence would be presented to the learner through a variety of means and strategies, including anytime, anywhere learning, and learner control over the pacing of the learning process.
On the structural side, Peters (1994) explicated the use of industrialization: new technology to reach a mass audience. He believed that media played a very different role in distance education than in a traditional university. The medium influenced and changed the direction of the pedagogical structure, thus the question of which carrier media to use in distance education becomes a practical, technical, and pedagogical issue (Peters, 2003). Much of the research has focused on structural integration of distance education and Web-supported learning environments as well as pedagogical considerations in new media environments.

Simonson, Schlosser, and Hanson (1999) believed that education at a distance should be built on the concept of equivalency of learning experiences. Equivalency theory key concepts are equivalency, learning experiences, appropriate application, students, and outcomes. The basic tenets of the theory suggested that while local and distant learners have fundamentally different environments in which to learn, it is the responsibility of the distance education educator to design learning events that provide experiences with “equal value for learners” (Simonson, Schlosser, & Hanson, 1999, p. 71). For example, access to the resources of a library should be readily available for both local and distance students, whether it is electronic, through agreements with local libraries, or through the delivery of library resources to the distant student. According to Simonson, et al. (1999) the equivalency concept contributes to more acceptance of distance education, but only if educators, learners, and the public see distance learning as not being distinct from traditional learning.

Researchers continue to analyze how the integration of both asynchronous and synchronous media tools, which are designed to enhance student-student and student-
faculty interaction, impact the student experience and the quality of learning. Improvements in information and communication technologies and the increase in internet access have made synchronous tools for instruction more popular. Asynchronous and synchronous learning environments differ by design and purpose. Literature continues to expand regarding the impact of synchronous technologies in the online classroom environment.

Synchronous learning is meant to emulate the traditional face-to-face classroom (Bernard et al., 2004). Ng (2007) suggested that synchronous conferencing offers a unique educational benefit. The real-time aspect of the interaction allows simulation of a real classroom learning situation and immediate interactive clarification of meaning. Additionally, synchronous conferencing through the Internet offers participants a feeling of immediate contact and motivation. Disbrow (2008) conducted a study examining the student perspectives of Elluminate Live. Students expressed positive experiences with the technology, including interactivity. Areas that contributed to student confusion and frustration were the inability to meet face-to-face, having to wait for responses to be typed, and with the talk button itself. Some participants “didn’t know what they were doing” and viewed the system as “complicated to use at first” (Disbrow, 2008, p. 230).

Another study conducted by Gillies (2008) explored student views of the videoconference as a teaching and learning tool in teacher education. Videoconferencing uses interactive audio and video to bring people at different sites together for a meeting synchronously. Participants completed a survey regarding their views of the effectiveness and value of videoconferencing. Survey respondents believed that some of the strengths of the videoconferencing included having the opportunity to get questions answered in
“real time,” group interaction, sharing opinions across a small group, and a more personal feel (Gillies, 2008). Weaknesses of the video conferencing format revolved around the technical aspects such as time delay and background noises.

Skylar (2009) compared synchronous online text-based lectures and asynchronous interactive web conferencing lectures. Two courses were designed to use both types of online instruction. Results were (a) 73.2% of the students would prefer to take online courses that use synchronous web conferencing lectures rather than an online course which uses asynchronous text-based lectures, (b) 87.8% believed that participating in synchronous web conferencing increased their understanding of the material, in addition to text-based lectures, and (c) 80.5% of the students believed that they performed better on weekly quizzes when synchronous web lectures were used to present the material.

As globalization and technology permeate society, distance education theorists and practitioners continue to seek and develop more effective approaches to online learning. Discussions about interaction, learning, and experience in distance and online environments are becoming prevalent in the literature. Interaction is defined as the act of communication verbally and physically. Interaction has been described as the key to effective learning and information exchange (Moore & Kearsley, 2005).

**Theoretical Framework**

Distance education has been a part of the educational landscape since the 1800s. Distance education scholars have explored unique concepts and developed frameworks that continue to serve as guides for practitioners. This study uses transactional distance and social presence as theoretical frameworks. In discussions about transactional distance, Moore suggested the distinction between three types of interaction: learner-
content, learner-instructor, and learner-learner (Moore, 1989).

The first type focuses on the interaction or relationship between the learner and the subject of study. It is the “process of intellectually interacting with content that results in changes in the learner’s understanding, the learner’s perspective, or the cognitive structures of the learner’s mind” (Moore & Kearsley, 2003, p. 2). In the second type, a learner seeks motivation, stimulation, and interest including self-direction and self-motivation from an expert who prepared the content material or an instructor. The final interaction occurs “between one learner and another learner, alone or in group setting, with or without the real-time presence of an instructor” (Moore & Kearsley, 2003, p. 4).

Hillman, Willis, and Gunawardena (1994) argued for a fourth type of interaction: learner-interface interaction. This type is unique to distance education. It is described as the interaction between the learner and the technologies that serve as an interface—the point of interaction—used to deliver instruction in a technologically driven society. The contention is the occurrence of an interaction with the technologies, how to “negotiate meaning, and validate knowledge with the instructor and other learners” (p. 30). In essence, the learner must possess the necessary skills to navigate and operate the mechanisms successfully before any kind of interaction can occur with the instructor, other learners, or the content. Some researchers argue that while distance education does require technology for the communication and delivery of content, the medium does not influence student learning (Cobb, 2009). However, others have explored a connection between the medium and the learning experience.

Some studies have explored social presence theory. The idea is that social factors can impact communication and learning, especially in an online environment. Short,
Williams, and Christie (1976) developed and described the concept of social presence as “the degree of salience of the other person in the interaction and the consequent salience of the interpersonal relationships” (p. 65). Furthermore, social presence is viewed as a quality of the communications medium itself (Cobb, 2009; Short, et al., 1976).

Homer, Plass, and Blake (2008) found when information is presented in a way that increases social presence, it is better remembered by learners and the learning process becomes more engaging.

In its original form, social presence theory was designed to measure face-to-face as well as audio and closed-circuit television encounters (Tu, 2002). However, researchers have adapted aspects of this theory to include computer mediated communication. According to Gunawardena (1995), social presence can be attributed to the degree in which a person is perceived as a “real person” in mediated communication. Garrison, Anderson, and Archer (2000) suggested a community of inquiry where learning occurs through the interaction of three elements: cognitive presence, teaching presence, and social presence. Cognitive presence encourages critical thinking and meaning through sustained communication.

Social presence is viewed as the ability of participants in a community of inquiry to project themselves socially and emotionally, as real people, through the medium of communication being used (Garrison et al., 2000). Furthermore, Garrison et al. (2000) focused on the use of the model in a text-based, asynchronous environment. A template was designed to serve as a tool to analyze and code messages in terms of cognitive, social, and teaching presence from computer conferencing. The template is a guide to promote the optimal use of computer conferencing as a medium for realizing educational
goals in a distributed learning context (Garrison et al., 2000; Gunawardena & Zittle, 1997). Studies have shown that real-time text-based discussion tools assist in collaborative-learning experiences and development of a learning community (Dueber & Misanchuk, 2001).

**Historical Context**

Historically, the literature indicates five generations of distance learning. Its early beginnings can be traced to a correspondence course instructing British students in Pitman’s shorthand system and subsequently spreading rapidly to other parts of Europe. Correspondence was provided through the print media, which served as the only available method of instructional delivery and formed the foundation for other delivery systems (Lease & Brown, 2009; McKee, 2010). Students enrolled in coursework, received syllabi and texts, submitted lessons, forms, and other materials through postal mail.

The instructor would provide feedback and return through postal mail. Correspondence offered flexibility and ease-of-use of print materials (Lease & Brown, 2009; Matthews, 1999; McKee, 2010). However, the disadvantages consisted of limited interaction with teachers and classmates. Additionally, the personal aspects and motivation required to move beyond content was a challenge. In the United States, the first official recognition of education by correspondence was Chautauqua College of Liberal Arts in New York in 1883 (Matthews, 1999).

Academic degrees were granted to students who completed work at summer institutes and by correspondence during the academic year (Nasseh, 2006). Debates centered upon the effectiveness of college by mail. William Rainy Harper, Yale
University professor, stated that correspondence study “would not, if it could, supplant oral instruction, or be regarded as its substitute” (as quoted in Nasseh, 2006, p. 2). Nevertheless, its popularity continued to grow as universities and colleges began to seek innovations in teaching and research. The University of Chicago explored and suggested the inclusion of correspondence on an experimental basis as a tool to develop and measure teaching methodology through the establishment of the first department of correspondence teaching (Nasseh, 2006).

In the 1880s, Charles Van Hise, President of the University of Wisconsin, was instrumental in carrying out the creation of his university’s extension program. It became known as the Wisconsin Idea, and was designed to provide education to all state citizens through summer Farmer’s Institutes that introduced state farmers to new techniques and technologies (Board of Regents of the University of Wisconsin). The program expanded to include similar programs for teachers and engineers.

The second generation of distance learning emerged through innovations in audio/visual tools. The expansion of radio broadcasting opened new avenues for delivery of content. Thus, the United States federal government granted radio broadcasting licenses to 202 colleges, universities, and school boards (Lease & Brown, 2009; Nasseh, 2006). During World War II, the Germans developed audio recording tape which provided a better sound quality than in the United States (Gross, 1989).

Educational material could be produced and placed into the proper sequence. Eventually, audiotapes led to the creation and development of audio cassettes, where correspondence courses in print could be supplemented with audio (Picciano, 2002). One of the most significant developments in distance education was the founding of the
United Kingdom’s Open University (OU). OU utilized a combination of mixed-media as a supplement to correspondence courses.

The OU sent course materials to students through postal mail. Materials included textbooks and audio and video materials. In addition, students were assigned a tutor who provided tutorial services over the telephone and in group sessions in the evenings or on weekends (Matthews, 1999). The first Open University in the United States was Empire State College in New York. Its mission was to make higher education accessible to non-traditional students who wanted to enroll in college-level courses. The college provided flexibility regarding degree requirements, college credits, and time limitation for completion of a degree. OU was instrumental in the increased usage of third generation broadcast television as an educational tool.

During the 1950s, as television continued to grow, several universities began broadcasting college courses using commercial television stations (Lease & Brown, 2009). In the early years of educational television, the Ford Foundation provided funding to a number of institutions. The funding created an opportunity for the development of one of the first degree programs available through at-home viewing: Chicago TV College, a fully accredited 2-year degree program. The military served as the leaders on the use of experimentation on film and video as instructional tools (Wisher & Curnow, 2003). Videos were designed for learning and enhancing motor skills. Training films were created and shown to recruits during the first months in the military.

In the early 1960s, the need for trained professionals in advanced physical sciences and technologies reached a new level of urgency with the Sputnik Revolution. The Russians had launched a man-made beeping satellite called Sputnik. During this
time, an influx of federal funding into scientific research and development occurred leading to the expansion of American universities. In Southern Florida, a new university was on the horizon as America began the “space race,” Nova University of Advanced Technology was chartered by the state of Florida on December 4, 1964 as a graduate institution in the physical and social sciences (Goldstein, 1989).

Abe Fischler became the university’s president and focused on the creation of new concepts in educational practices. Fischler, a professor of Education at Harvard University, was approached with the idea of developing an educational model for South Florida named “the Nova concept” (Solomon, 2009). Fischler’s model focused upon the acquisition of practical skills to help people in their current profession. He would implement this learning concept by bringing education to people in their own locations through a unique form of distance education. The instructors would fly to various clusters around the country and meet with students in such places as a library or hotel conference room (Solomon, 2009). Eventually, the university started incorporating the use of computer and other telecommunications in the teaching and learning process.

The third generation continued to flourish with the inclusion of audio conferencing and videoconferencing. Video conferencing allowed faculty members to teach in a traditional classroom while instructing a different group of students in another classroom via interactive video and satellite (Lease & Brown, 2009; Nasseh, 2006, Wisher & Curnow, 2003). An audio link provided an opportunity for live, synchronous interaction and to ask questions (Lease & Brown, 2009; Nasseh, 2006; Wisher & Curnow, 2003). The fourth generation model introduced a flexible learning component as the computer and technology permeated society. Advancements in personal computers
and the introduction of the World Wide Web led to innovations in instructional delivery and with this the impact of computers on distance education could be described as a phenomenon that changed instructional delivery and higher education (Lease & Brown, 2009).

The proliferation of computers in distance education was fueled by the formation of educational partnerships among colleges, universities, and corporations. Higher education institutions collaborated and pooled resources, resulting in greater course and program offerings (Lease & Brown, 2009). The development of computer software programs and learning management systems specifically designed for educational purposes such as Blackboard provided an organized method for course delivery. While distance education continued to adjust with the changing needs of society, its basic premise of providing educational opportunities for students who were not able to attend traditional, campus based courses and programs remained intact.

Distance education’s growth had occurred rapidly in the decades following the opening of OU in 1969. For example, in Australia, the University of Queensland’s distance education program had grown to 3,000 students in the 1960s; in the United States, by the mid-1980s, more than 300,000 students were enrolled in university-taught distance education courses; and, in Canada, about 19 conventional universities were active in teaching at a distance (Matthews, 1999). By the mid-1980s, some 40 institutions had an enrollment of external students’ equivalent to approximately 12% of all students enrolled in higher education (Matthews, 1999). The fifth and current generation of telelearning brings future exploration of new technologies. Additionally, global competition for online students and the need to evolve in a learning economy continues to
present a challenge to the higher education community.

The computer-mediated tools created in the fourth generation (synchronous interactive software) are now being used to explore and develop more advanced applications (Lease & Brown, 2009; Matthews, 1999). Thus, the fourth and fifth generations of distance education are transforming higher education simultaneously. The fifth generation has changed institutional processes that are having an impact on both distance and on-campus students (Lease & Brown, 2009; Matthews, 1999).

**Attrition and Persistence in Distance Education**

In 2002, enrollment in distance courses and programs reached 78% in colleges and universities (Parker, 2003). However, problems surfaced with the ongoing rise in enrollment numbers. Carr and Ledwith (2000) reported high attrition rates in distance courses to be more than 40%. Additionally, Carr and Ledwith (2000) noted that persistence in distance programs is 10%-20% lower than traditional programs.

Distance students can represent adult learners who are considered nontraditional. They are over the age of 24, have family and work responsibilities, and are part-time students with full-time jobs. According to Chyung, (2001), students drop out of distance courses for a variety of reasons: student interests and course structure do not match, instructors and students are not comfortable with the virtual format learning, and students have learned what they wanted. According to Wheeler and Amoitte (2005), students who are not in the same location as their peers and instructors experience isolation and lack of individual attention, and may be at a higher risk for attrition. There is also agreement among researchers that online students are more likely to experience isolation and alienation from the institution (Hirt, Cain, Bryant, & Williams, 2003; Kretovics, 2003;
Northup, Lee, & Burgess, 2002; Russo & Campbell, 2004).

Attrition can be described as students who drop out of courses or programs (Tinto, 1987). Persistence can be described as when a student persists or progresses towards a goal (Reason, 2009; Tinto, 1987). The most well-known model to address the attrition issues at institutions of higher learning is Tinto’s (1987) student integration theory. Tinto suggested that “the more central one’s membership is to the mainstream of institutional life the more likely, other things being equal, is one to persist” (p. 123). He referred to social and academic integration variables (student experiences subsequent to admission are affected by school policies and practices). Additionally, Tinto believed that insufficient interactions with peers and faculty and differences with prevailing value patterns of other students are likely to result in dropouts.

In essence, students who feel a low sense of community feel isolated and are at risk of withdrawing (Rovai, 2002). Bean and Metzner (1985) designed a student attrition model with Tinto’s work as a framework to explain attrition in the nontraditional student population. It was Bean and Metzner’s (1985) contention that nontraditional students have different support structures than traditional students. Nontraditional students have little interaction with other groups within the college community. Therefore, the base of support comes from a group of peers, friends, family, and employers outside of the institution.

Four factors that affect persistence were identified: (a) academic areas such as study habits and course availability; (b) background and demographics such as age, ethnicity, prior GPA; (c) life situations such as finances, employment, family responsibilities; and (d) psychological outcomes at the college (Bean & Metzner, 1985).
These factors have a sphere of influence on decisions for the non-traditional student. There is mention of GPA and institutional commitment as in Tinto’s model. However, the impact of these factors on persistence is based on perceptions of gaining employment, job promotions, satisfaction, and ability to transfer to other institutions. The model can be applied to the non-traditional distance student. The pull and pressure generated from the variables on time, resources, and psychological esteem influences the persistence of non-traditional students.

Another model influenced by Tinto was Kember’s opening learning model (1989). The model utilized the integration concept. Its constructs include entry characteristics, academic integration, social integration, and external characteristics. Entry characteristics reflect demographic status and employment. Academic integration is split into the positive (academic integration) and negative (academic incompatibility) tracks. The academic factors are influenced by study approach, motivation, course evaluation, and language ability (Liu, Gomez, Khan, & Yen, 2007). Social integration consists of enrollment with the inclusion of employment, family, and social life. External consists of insufficient time and unexpected events. Kimber, Lee, and Li (2001) investigated the need for a sense of belonging and its relationship to persistence, but the suggestions are designed for a university that requires some on-campus contact and attendance.

Rovai (2003) developed a model that utilized elements from Tinto and Bean and Metzner. Both models were designed for traditional and non-traditional students who attended classes on campus. Rovai (2003) focused on adaptation for online learners with the development of the Composite Persistence model, which focuses on student
characteristics and skills prior to admission and external and internal factors affecting students after admission. Student characteristics such as ethnicity, gender, age, intellectual development, and academic preparation prior to college can influence student persistence (Bean & Metzner, 1985).

A noteworthy finding of Rovai’s (2001) research indicated that females are more successful in online courses than males. The differences are reflected in communication patterns between the genders. It was found that men (and some women) possessed an independent voice, while the majority of women (and some men) projected a connected voice. Those with the highest levels of community were most likely to write with a sense of connection and those with the lowest levels of community tended to write with an independent voice (Rovai, 2001). The low sense of community reflects a feeling of isolation and disconnectedness.

Other researchers have revealed that the disconnection can affect student persistence in online courses (Hirt et al., 2003; Kretovics, 2003; Northup, Lee, & Burgess, 2002; Russo & Campbell, 2004). Additional variables that influence student persistence involve special skills prior to admission. Students must be knowledgeable and skilled in computer literacy, interpersonal abilities, and organization. Other factors considered in the model specific to distance education are: (a) consistency and clarity of online programs, policies, and procedures, (b) self-esteem, (c) identity with the school, (d) social integration, and (e) ready access to support services such as bookstore, library, financial aid, and advisors (Rovai, 2001).

Instructor-to-student and student-to-student interaction and feedback must be designed in a manner that meets learning objectives and nurtures self-confidence in the
student. Additionally, interpersonal relationships with peers, faculty, and staff must be emphasized. Finally, learning style and the self-directed aspect of the online environment has to be considered. Students are encouraged through taking control of their own learning. The models do not distinguish between the types of institutions or ways the models can be utilized within the different environments. Higher education is a large, multidimensional system that includes community colleges, four-year public and private universities and colleges, and for-profit two and four-year educational environments.

Liu et al. (2007) developed an online course dropout framework for the community college. It was not designed to be a full model but serves as a recommendation using existing models. The recommendations focus on the need for early identification and effective intervention programs. The mission of the community college is to serve all segments of society with a flexible and open admissions policy. Thus, it is an environment that is conducive to distance learning.

Allen and Seaman (2005) reported that 72% of associate degree institutions indicated that online learning is part of the long-term strategic plan. Community college students are typically non-traditional and have competing roles such as a full or part-time job and are raising children. Therefore, self-motivation, self-direction, and self-discipline are an essential part of enrollment for distance learners. The framework suggested by Liu et al. (2007) can be applied to any higher education institution as administrators seek opportunities to address the online student dropout rates.

Due to the complexities of individual student situations and circumstances, researchers have recognized that attempts to discover a simple reason for attrition in distance education is “futile” (Morgan & Tam, 1999). Thus, the focus has been upon
measuring and examining approaches and the development of intervention strategies. Chyung (2001) suggested that institutions consider using learning-oriented and goal-oriented approaches. Environments should provide interesting and relevant knowledge where students can accomplish goals. A systematic approach requires a step by step process, from beginning to end.

A systemic process recognizes that any changes to the system will impact other larger parts through a ripple effect of events. Chyung (2001) measured the practicality of a systemic approach at a higher education institution and the effect on attrition in its online program. The academic program at the research site offered all of its master’s degree courses via the internet as well as offering the same courses on campus. The program experienced significant dropout rates in the online component. Chyung (2001) applied the Organizational Elements Model (OEM) as a framework.

The OEM consists of five elements that interact with each other and are classified as inputs and processes (means) and products, outputs, and outcomes (end results). The levels of evaluation were from the learner’s perception (including motivational appeal based on attention, relevance, confidence, and satisfaction); the organizational product (differences between pre- and post- tests); and organizational output (attrition rates). Kemp (2002) investigated the relationship between persistence, life events, external commitment, and resiliency in undergraduate distance education. A series of instruments that measured resiliency attitudes, life events, and external commitments were distributed to students.

Results show that work commitments are highly significant as a predictor of persistence, and life events did not appear to play a major role in determining whether
students completed their courses. The biggest differences occurred in the resiliency category. Resiliency is based upon four skills (relationships, general resilience, initiative, insight) and five sub-skills (attaching, persistence, valuing, recruiting, generating). Students with high levels on the nine measures were more likely to succeed in undergraduate studies. Surprisingly, the study revealed that previous experience in a distance education course was not a predictor of persistence.

Research in the areas of attrition and persistence include discussions about student engagement. Student engagement focuses on what students do in college and how their behaviors, opportunities, and environments mediate college retention and graduation (Kuh, Kinzie, Schuh, & Whitt, 2005). Astin’s student involvement theory (1984) is a well-known model used to understand conditions that foster development. The theory is defined as “the amount of physical and psychological energy that the student devotes to the academic experience” (Astin, 1984, p. 518). Additionally, he asserted that the amount a student learns comes from the quality and quantity of the involvement. Furthermore, just exposing a student to information or coursework is not enough. Students must be actively involved in the learning process.

Through over thirty years of research, Pascarella and Terenzini (1991, 2005) postulated that multiple forces operate in multiple settings to influence student learning and persistence. Thus, there is a “pronounced breadth of interconnected changes” (Pascarella & Terenzini, 2005, p. 578). Kuh (2004) developed a comprehensive engagement model using elements of Tinto (1987) and Pascarella and Terenzini (1991, 2005) that emphasized studying and the whole academic experience; student and faculty interactions inside and outside of the classroom; and active/collaborative learning
activities that involve student application of knowledge in a number of situations. Kuh, et al. (2005) as well as the models developed by Astin (1984), Tinto (1987), and Pascarella and Terenzini (1991, 2005) examined the traditional, undergraduate population at four-year residential institutions.

Researchers who are interested in the non-traditional student experience will find some use for the models. However, Kimber (1989) and Bean and Metzner (1985) provided foundational elements that can be applied to the online student population. As students matriculate in online courses in record numbers, researchers are examining ways to address engagement. Engagement creates a sense of community where the student feels a connection and is motivated to continue with coursework. Universities and colleges are experimenting with diverse methods to meet the needs of online students.

Dixson (2010) explored activities and/or interaction channels that might lead to more highly engaged students in online courses. Results revealed that there is no particular activity that will automatically help students to be more engaged online. But results indicated that communication channels, student-student, and instructor-student communication are correlated with higher student engagement. Lester and Perini (2010) and Heiberger and Harper (2008) argued for an extension of the student engagement model to include an interaction with social network sites such as Facebook, MySpace, and Twitter. Social networking sites are designed to build virtual communities through sharing experiences, communicating personal information, and connecting to friends (Lester & Perini, 2010). Facebook, the most popular online social network site, allows users to connect individually and with large groups.

The complexities of technology have modified the traditional engagement
concepts of academic challenges, interactions, and collaborative learning. Apprehension about the use of social networking sites to enhance distance education student engagement has surfaced. The sites are viewed as social environments and students are uneasy about interacting and communicating with administrators about school-related business (Boyle, Kwon, Ross, & Simpson, 2010; Watson, Smith, & Driver, 2006). Additionally, instructors are finding difficulty interacting with students on the sites (Young, 2002). Other matters involve how to effectively integrate the technology into the curriculum.

Pawan, Paulus, Yalcin, and Chang (2004) measured patterns of engagement and collaborative interactions among in-service teachers in online courses. One major purpose of the study was to develop a guide in the design of instruction and learning. Findings show that without instructor guidance and teaching presence, students engaged in serial monologues during asynchronous forums. The serial monologues are described as “discussions in which participants share past teaching experiences and freely express their opinions with minimal effort made to connect to the contribution of others” (p. 119). The likelihood of such an occurrence in a synchronous classroom is minimal. In a synchronous format, the instructor controls the technical mechanisms and has greater control over the discussion. The instructor can interrupt and change the direction of the discussion.

Boyle et al. (2010) proposed distance student engagement through mentoring and peer support initiatives. The study reported on three mentoring programs in the United Kingdom, Korea, and New Zealand. All of the colleges and universities are distance education institutions with student enrollment ranging from 30,000 to 220,000
respective. Mentoring and peer support can occur in two ways: experienced students with newer students and students in the same course helping each other. The consensus revealed that overall students had a positive experience with the mentor.

Chen, Lambert, and Guidry (2009) reported a positive relationship between Web-based learning technology use and student engagement and learning outcomes. The study contends that students who utilize the Web and internet technologies tend to score higher in the traditional student engagement tenets (academic challenge, collaborative learning, and student-faculty interaction). Students also utilize higher order thinking through reflective learning activities. Institutions are being held accountable to legislatures, governing boards, the federal government, and taxpayers for program completion rates and outcomes. Colleges and universities continue to seek ways to effectively address the dropout issue for their online courses.

Models serve as tools and are being developed. As the growth of online education continues to expand in all university and college settings, more researchers are exploring perceived reasons for high attrition rates. While the concepts for each model are different, there is consistency among the models regarding poor time management, lack of management oversight, lack of motivation, problems with technology, lack of student support, individual learning preferences, poorly designed courses, and substandard/inexperienced instructors (Hirt et al., 2003; Kretovics, 2003; Northup, Lee, & Burgess, 2002; Russo & Campbell, 2004).

**Online Teaching**

The student experience in the various educational settings cannot be fully examined without the instructional component. In distance education, it is a formula that
consists of technologies, types of interactions, and learner control. Instructors must adapt
to their changing roles in a new environment. According to Shearer (2003), some of the
critical factors that have to be considered when building a distance education course are
audience characteristics, geographic dispersion of the audience, the technologies
available to the audience, the goals of the learners, and the goals and mission of the
learning organization. Using this information, instructors have to determine how the
material will be presented without losing authority and control.

Thus, the instructor’s role and removal from the learner in space and time presents
unique requirements for managing the pedagogical and logistical elements of instruction
(Darabi, Sikorski, & Harvey, 2006; Perraton, Creed, & Robinson, 2002). Pedagogical
aspects include motivating students, promoting relevant learning, facilitating access to
course content, engaging the learner in activities and discussions through communication,
monitoring learners’ progress, and adjusting learning opportunities to support learners in
areas of difficulty (Darabi et al., 2006; Holmberg, 1995; Levine, 2007). In a distance
education environment, the transfer of information moves to guiding learners in their
pursuit of knowledge. The learner becomes responsible for learning while the instructor
acts as coach, facilitator, or tutor. Additionally, instructors must manage logistical
components using technology and the World Wide Web (including advanced
synchronous software).

In essence, instructors take on two roles and become not only subject matter
experts but technology experts as well. Proponents advocate that Web-based technologies
can and should be used in distance education to generate a teaching and learning
environment substantially different from the traditional one (Sammons, 2003).
Additionally, Ruhleder and Twidale (2000) stated “The availability of increasingly robust Web-based networked technologies offers opportunities for creating and sustaining collaborative, reflective learning experiences” (p. 1). However, instructors can present a challenging view of the technologies associated with distance education. Wagner (1994) stated that two-way interactive technologies (e.g. video, audio, audio graphics, and computer conferencing), “while capable of providing two-way interactivity, still depend on user skill to successfully bring about interaction in an instructional context” (p. 9).

Stewart’s (2008) investigation focused on transactional distance as a framework in determining what, how and why some instructional strategies have the potential to promote synchronous dialogue online in a web-based classroom. The study examined the three constructs of the transactional theory: structure, dialogue, and learner autonomy. The use of Stewart’s (2008) survey and interview data-generating instruments were warranted.

Stewart’s (2008) approach is extensive as it involves a number of case studies using the Delphi method, instructor interviews, surveys, observations, and a researcher journal. The main purpose of the Delphi method is to “obtain the most reliable consensus of opinion of a group of experts” (Creswell, 2008). Additionally, for the study, a high-end synchronous web-based computer system (SWBCS) was used (Elluminate) as a tool or medium to address the theoretical and practical relationships espoused in transactional distance theory. A SWBCS is defined as an online computer system that uses different tools to enhance real-time communication with as few as two people or as many as possible according to the content or connections available.

The findings revealed that instructors used the following strategies to enhance a
learning-centered synchronous environment: (a) establishment of social presence by using humor; (b) the creation of opportunities for discussion; (c) respect for diversity and ways of learning; (d) encouragement and provision of feedback; (e) communication of high expectations; and (f) reinforcement of ideas, concepts, and knowledge (Stewart, 2008). The strategies were based on prior teaching experience and educational style. Additionally, the main tools used by instructors to implement the strategies were (a) audio, (b) direct messaging (text chat), and (c) whiteboard. Reasons for using these tools include (a) simplicity of use for the instructor and student; (b) presentation needs of the instructor, such as whiteboard, and (c) immediate dialogue, such as audio and direct messaging (Stewart, 2008).

In a study conducted by Shea, Pickett, and Li (2005), faculty were surveyed about their satisfaction, interaction, technical preparedness, and time investment in online environments. While the study did not ask specifically about synchronous tools used, it did provide an overall examination of instructor issues regarding online courses. Findings revealed that interaction, technical support, and faculty learning were the biggest concerns. Faculty responses suggested that high levels of interaction can influence faculty decisions to adopt, reject, or continue with online teaching. Faculty reported satisfaction with online teaching and the courses taught with the existence of a technical and programmatic support system. In terms of learning, faculty believed that teaching online courses provided an opportunity to consider alternative means of instruction and alternative means of assessment.

Dennen, Darabi, and Smith (2007) examined the relative perceived importance of instructor actions to student performance in online courses according to both instructors
and students. Comparative rankings between instructor and student beliefs revealed that checking emails, providing timely feedback, and providing examples ranked as the biggest concerns. Mortera-Guitierrez and Murphy (2000) conducted a case study to analyze the basic instructional design components, interactions, and practices used in distance learning. It was found that educators persist in replicating face-to-face instructional experiences via technology. The instructors with the most experience with distance education formats were more effective in their interactions, designing the course content, and using technology other than their counterparts with little or no distance education knowledge or experience (Mazzolini & Maddison, 2003; Shea et al., 2005; Wyatt, 2005).

Bender (2003) found that many faculty members believe that incorporating technology can be frustrating and confusing. Additionally, many feel a loss of quality control which is very different from the face-to-face traditional classroom. Other faculty members state that online teaching is time-consuming. In their opinion of the synchronous format, faculty expressed concern about its hectic and seemingly chaotic nature. Conversations and discussions can lose focus and move into different directions. The pace can be a challenge as one tries to talk and/or type responses in a chat room or Elluminate Live discussion. Another component is the inclusion of synchronous conferencing tools in hybrid or blended courses, where face-to-face class meetings were combined with online conferencing.

Grant and Cheon (2007) examined the value of using synchronous conferencing for instruction and students in a hybrid environment. Results showed positive attitudes towards video and audio conferencing. When comparing the two methods, audio
conferencing had better technical and instructional quality than video-conferencing.

Further discussion centered on the four critical factors to consider when implementing synchronous conferencing: (a) the quality of the video and audio, (b) training time, (c) teaching strategies, and (d) opportunities for face-to-face meetings. In the case of face-to-face meetings, text chat and instant messaging were employed (Grant & Cheon, 2007).

Researchers are developing quantitative and qualitative studies that examine online instructional teaching strategies and techniques. There are concerns about how to effectively implement quality experiences for the student. Scholars have combined traditional constructivist principles with a web-based environment to address the teaching dynamics of an online, technological paradigm. Knowlton (2000) discussed a student-centered online teaching environment with emphasis on “managing the learning experience and not on managing the technology” (p. 11).

Lewis and Abdul-Hamid (2006) focused on an understanding of how faculty practices were implemented in an online classroom with themes that included providing student feedback, fostering interaction and involvement, facilitating student learning, and maintaining instructor presence and organization. Faculty facilitated interaction in the form of discussions, study groups, and group projects using boards, chat rooms, and email. Within the interaction, students are required to make substantial contributions and not present similar answers. Yang and Cornelious (2004) discussed strategies for the design and delivery of online courses that encourage and integrate deep learning, critical thinking, collaborative learning, and problem-based learning methods. Student learning becomes active with engagement that centers upon real-world scenarios that require team or group activities.
Sobel, Sands, and Dunlap (2009) developed an online course approach with an emphasis on creating meaningful experiences. For example, in a group discussion where students can bring up points that lead the entire group in a different direction and into other topics. The instructor has to show restraint and wait for interactions to occur before intervening and returning to the appropriate topic. Usually students will return and self-correct in a synchronous environment. However, in an asynchronous exchange, it does not happen as quickly. Nevertheless, positive interactions are based upon the common denominators of personalization, meaningful engagement, and checking for student understanding.

Dringus, Snyder, and Terrell (2010) suggested the inclusion of mini audio presentations (MAPs) in discussion forums. The emphasis is on teaching and social presence of the instructor. MAPs are developed to include instructional material with feedback markers and are posted as attachments with a text summary in the forum. While a number of suggestions have been made to enhance the instructional side of the online environment, there is a consensus among the studies that exemplary online faculty members foster and encourage active learning experiences with consistent interaction and a sense of community. A learning community should provide encouragement, cooperation, a sense of connection, and respect.

In an online course setting, the community must bring a feeling of inclusion despite the distance and lack of face-to-face exchanges. Instructors serve as a primary key in creating and ensuring quality experiences. Instructors have to adjust their “attitudes to teach online, understand what qualifications are needed, and know what they could do to ensure the quality of online education instruction” (Yang & Cornelious, 2004, p. 851).
With the increase of online courses, the traditional concept of learning and teaching has shifted. Technological advances have also impacted the way researchers, practitioners, and society view education.

Critics have often questioned the quality of online instruction. Although distance education has existed for over three centuries, many continue to view it as inferior. University and college leaders are under pressure to address quality assurances to a number of constituents internally and externally. And while there are distinct instructor and student dynamics within the respective environments, the challenge remains the same: providing an environment that supports and provides relevant and meaningful learning experiences (Yang & Cornelious, 2004).

**Research Questions**

The purpose of this study is to assess student and faculty views regarding the use and impact of synchronous tools on student learning and experience in the online college classroom. Previous research suggests that distance education is not simply the addition of technology to instruction; instead, it uses technology where appropriate and creates new approaches to the teaching and learning process. This study will be guided by the following research questions:

1. Quantitative: What are student perceptions of synchronous tools in online courses?

2. Qualitative: What are instructor perceptions of synchronous tools in online courses?
Chapter 3: Methodology

Introduction

This chapter consists of four sections. The first section discusses the participants in the study with detailed information about the research setting, population demographics, and sampling procedures. The second section provides details about all data collection instruments including the source, validity and reliability information, and specifics on the number of items for each scale. The third section focuses on the procedures that encompass both design and data analysis. It serves as the framework that outlines the “how” of the research. It is written in a step by step linear process with emphasis on data collection and analysis. Quantitative and qualitative methods were both used to generate and analyze the data. The final section discusses any limitations that may impact the degree to which the tool measures what it claims to measure (validity).

Participants

This study will take place in the school of education at a private, nonprofit research university in the southeastern United States. The university was founded in 1964 and has produced approximately 90,000 alumni. The university awards associate’s, bachelors, masters, educational specialist, doctoral, and first-professional degrees in a wide range of fields. It is a pioneer in distance education, serving as the first higher education institution in the United States to offer graduate programs in an online format. Forty of the university’s online undergraduate, master’s, doctoral, and graduate certificate programs have been certified by the Southern Regional Education Board’s Electronic Campus.
The university offers almost all of its programs via site-based, cluster-based, and online curriculum delivery. Currently, there are 8,795 (31%) males and 19,946 (69%) females enrolled in undergraduate, graduate, and first professional programs. The university is a Hispanic-serving institution and has been recognized for conferring doctoral degrees to African Americans. Racial/ethnic enrollment reveals White/Non-Hispanic-10,815 (38%); Black Non-Hispanic-7,617 (27%); Hispanic-6,300 (22%); and other minority 1,846 (6%).

The average ages of students enrolled range from 24-34 for undergraduates; 33-36 for graduates; and 24-34 for first-professional. The school of education is one of ten centers/schools within the university. As of fall 2010, the university had 723 full-time faculty members (381 male and 342 female) from various ethnic backgrounds. Each year, the school serves about 12,000 part-time and full-time undergraduate and graduate students located in about 55 cities and 29 states in the United States and in nearly a dozen countries. In addition, the school of education offers the highest percentage (33%) of student enrollment among the ten centers/schools at the university.

**Quantitative.** A homogenous sampling was used to select participants because it suits the purposes of the study. This sampling method was used because it “represents characteristics to a similar extent” (Gall, Gall, & Borg, 2005, p. 311).

The research sample was drawn from current graduate students for two reasons. First, all of the survey participants have a similar relationship to the school of education as students. Second, the school is an innovator in the use of online technologies and has implemented initiatives to reach students nationally and globally. It has extensive online graduate degree programs where synchronous tools are used as a way of communicating
and interacting with students. Initially, there were five graduate level courses selected with a target of 30 students (6 per course).

The online courses were randomly selected from the Fall 2011 course catalog offerings. The four courses selected had a total enrollment of 65 students. All of the courses were 3 college credits, took place during a 16 week semester, and included major and minor concentrations in Higher Education Leadership, Organizational Leadership, Educational Leadership, Healthcare Education, Conflict Resolution, and Instructional Technology and Distance Education.

**Qualitative.** The instructors that teach the selected courses from above-mentioned concentrations in Higher Education Leadership, Organizational Leadership, Educational Leadership, Healthcare Education, Conflict Resolution, and Instructional Technology and Distance Education were interviewed. However, the study’s inclusion and eligibility criteria limited participation by targeting instructors who use or have used Elluminate as a synchronous tool in their online courses. Initially, the researcher emailed 5 instructors. However, one instructor was removed from consideration due to not meeting the eligibility requirement. The study commenced with four instructors.

**Instruments**

There were two data generating instruments utilized for the research study. Survey (see Appendix A) and interview (see Appendix B) instruments designed by Stewart (2008) were selected and distributed to gather perceptions of and attitudes about synchronous technology. Consideration was given to the validity and reliability of the instruments. According to Yin (1994), multiple sources of evidence are a way to ensure construct validity in case study research, while reliability is established through the
development of a case study protocol (Yin, 1994). The protocol should consist of a detailed overview of the case study project, field procedures such as credentials and sources of information, specific questions that must be kept in mind during data collection, and a case study report or outline (Yin, 1994, p. 64).

Stewart’s (2008) research used multiple sources of evidence, case studies using the Delphi method, instructor interviews, focus groups, surveys, observations, and a researcher journal. Yin (1994) further stated that results are strengthened by replication as it increases confidence in the robustness of theory in case study research. Stewart’s (2008) study was comprehensive, included a number of data collection methods, and took place at various times during a full semester (16 weeks). The current study was not designed to be a full replication, but to gather general information about attitudes and perceptions within a 4 week timeframe during the Fall semester. The most appropriate methods for gathering this information were the survey and interview instruments. The methods were chosen because the researcher could maintain some control and acquire knowledge. It is the intention of the researcher to conduct a longitudinal study using an exact replication of Stewart’s (2008) methodology in the near future.

Stewart’s (2008) survey questions were developed from an initial web-based student survey that garnered baseline data on demographics and prior experience with distance education courses. The survey entitled, “Perceptions of Synchronous Tools in Online Learning Survey” (see Appendix A) included questions related to: (a) practice sessions and set-up, (b) frequency used and participation in all sessions conducted, (c) student descriptions of how the class most used Elluminate, (d) dialogue with instructor, (e) technical issues and dialogue, (f) quality of dialogue/Elluminate features, (g) overall
organization, (h) feelings about the use of Elluminate in the course, and (i) changes to Elluminate. The survey followed an open and closed form, meaning a combination of multiple choice and essay questions. Each scale item has 2-4 response categories. Only graduate students completed the survey.

The Instructor Interview Protocol (Appendix B) was administered to instructors of courses with major and minor concentrations in Higher Education Leadership, Organizational Leadership, Educational Leadership, Healthcare Education, Conflict Resolution, and Instructional Technology and Distance Education. It was determined that the interview would follow a structured format. A structured interview has a formalized, limited set of questions and is beneficial to comparing and contrasting participant responses (Creswell, 2008). The interview questions were developed by Stewart (2008). The instrument was selected because it addressed two main components, depth and breadth. The depth came from instructor experience with synchronous tools and breadth was generated from instructor knowledge of different content and instructional areas. The interview obtained information about: (a) instructor background, (b) experience with online course development, (c) experience with synchronous online tools, (d) anticipation about experiences with course delivery, (e) pedagogical strategies used, and (f) the instructor’s overall satisfaction regarding student performance, knowledge, interaction, communication and establishing a sense of community.

**Procedures**

This study used a mixed methods approach with both qualitative and quantitative designs. A mixed methods study involves collecting, analyzing, and mixing both quantitative and qualitative data in a single study or a series of studies (Creswell, 2008).
There are various types of designs associated with mixed methods. The design for this study followed a sequential formula where quantitative and qualitative data were collected at the same time. The two data sets were analyzed separately.

**Quantitative data.** The data collection process occurred over a two-week period during the months of October and November. This timeframe was chosen because students would have used the synchronous technology more than once during the semester. In order to maintain the privacy of all potential participants, the researcher did not have access to student emails. Students received an email introduction letter (Appendix D) and link to the Free Online Survey from the instructor of the randomly selected courses. Upon clicking on the link, the participation letter appeared on the screen. The participation letter is a one to two page document that provides detailed information about the study and addresses the protection and rights of human subjects. It is designed to be used with anonymous surveys with adults only. The participation letter does not require a signature and subjects are not expected to return the letter to the researcher. After reading the participation letter, the subject clicked on “survey” and proceeded as directed. The survey took 10-15 minutes to complete. The survey was de-identified as it did not require any subject names and the data fell into a database that only the researcher could access.

**Qualitative data.** After receiving Institutional Review Board approval, the researcher emailed the instructors. The first question in the email was: “Do you use Elluminate Live as an instructional tool in your class?” If the answer was yes, the instructor was prompted to keep reading the email where a brief introduction (Appendix C) and the purposes of the research study were discussed. If the instructor was interested
in the study, then he or she responded via email. The instructor signed the consent form and returned to the researcher in person. The interview took about 45 minutes to an hour and was audio recorded for accuracy.

Steps were taken by the researcher to ensure privacy and confidentiality of the recordings. The researcher explained the purpose of the audio recording to the instructors and asked permission to do the recording. The interviews were completed using a digital recording device. The researcher transcribed the interviews and transferred the recording from the digital device to a password protected computer. The recordings were deleted from the digital device and stored on the computer. The recordings will be maintained on the computer for 36 months. At that time, the recordings will be deleted from the computer.

**Data Analysis.** Descriptive research is a “type of quantitative research that involves making careful descriptions of educational phenomena” (Gall et al., 2005, p. 300). Descriptive statistics provide summaries about the sample characteristics and responses to individual survey questions and can be presented with simple tables and charts (Sue & Ritter, 2007). In this study, a frequency distribution was used to analyze the statistical data from the survey. The frequency distribution of a particular questionnaire item shows the number and/or percentages of respondents who selected each response option (Sue & Ritter, 2007). The instructor interviews followed a qualitative approach with the proceeding steps: (1) a careful examination, analysis, and grouping of the data in the early stages to acquire an understanding of the information; (2) developing and analyzing common themes across categories; (3) developing a qualitative narrative; and (4) interpretation of the data (Creswell, 2008). The approach
was designed to address instructor perceptions of the synchronous tools used in the course.

Limitations

There were some limitations that existed in this study. Distance education is a phenomenon in the education field and affects every community college and university in the country and throughout the world. This study was limited to one university and the results are specific to its organizational setting and within each individual course. Another limitation was knowledge of computer technology. There was the possibility that some subjects possessed little knowledge or skills in advanced technology in order to fully understand how to complete an online survey.

There was some possibility of bias while gathering the qualitative data. Direct interaction between researcher and interviewee made it easy for subjectivity and bias to occur (Gall, Gall, & Borg, 2005). These issues were taken into consideration by the researcher. The researcher tried to address instances of bias by asking specific questions from a pre-designed interview protocol and not deviating from these questions. Additionally, audiotaping was included for accuracy and to avoid the possibility of taking biased notes.

The course instructors emailed the Free Online Survey link to students in their respective courses. Upon clicking on the link, it was expected that students would have direct access to the participation letter explaining their research rights and the survey. But technical problems with the online survey system prevented immediate completion of the survey. This issue was resolved and students were able access the survey. Initially, data collection was designed to be completed within a 2 week period. However, this
timeframe was extended to an additional 2 weeks to allow more time for survey completion from the participants.
Chapter 4: Results

Data collection for this study took place in the middle of an academic semester. Two types of data were collected using a student survey and faculty interview questionnaire. The methods used to collect the data were implemented during the semester. The techniques used followed both a qualitative and quantitative approach.

This chapter presents the results in response of the two research questions: What are student perceptions of synchronous tools in online courses? What are instructor perceptions of synchronous tools in online courses? The data generated from the survey and interview will be presented. Statistical and qualitative language will be used to show both individual and aggregate data.

Introduction. There were a total of 18 questions on the survey designed to gather data about student experiences and attitudes about the synchronous technology used in current and previous online courses. The survey consisted of a combination of multiple choice and essay questions without any personal identifiers. Survey participants completed the survey within 10-15 minutes.

Demographics and background. All of the students surveyed were graduate students studying in the school of education. Four courses were randomly selected from concentrations in Higher Education Leadership, Organizational Leadership, Educational Leadership, Healthcare Education, Conflict Resolution, and Instructional Technology and Distance Education. Twenty-three surveys were completed over a three week period. There were 6 (26%) participants between 30 and 40 years of age; ten (44%) between 40 and 50 years of age, and a remaining 7 (31%) between 50-60 years of age as shown in Table 1.
The majority of respondents 15 (65%) had completed 4 or more online courses prior to the current semester while 1 (4%) had taken 3 online courses previously, another 4 (17%) completed two online courses, and 1 (4%) had not taken any online courses. Most of the students 22 (95%) reported they were aware the course had a real-time synchronous component. Thirteen (56%) of the students believed the course instructions about the technology used were clear. Four of the students (17%) reported that instructions were somewhat clear; another 4 (17%) believed the instructions were very clear, and 2 (9%) expressed the instructions were not clear.

**Survey Question 1.** Have you ever taken an online course that used synchronous software such as chat, videoconferencing, or two-way radio? Fourteen (60%) of the students reported they had taken an online course that used synchronous software such as chat or videoconferencing while 9 (39%) reported that they had not previously participated in such a format.

**Survey Question 2.** Did you participate in an Elluminate practice session? When students were asked whether they participated in an Elluminate practice session, 19 (83%) responded with yes, while 4 (17%) said no.

### Table 1

*Frequency Distribution Table*

<table>
<thead>
<tr>
<th>Ages of participants</th>
<th>Frequency</th>
<th>Percentage</th>
<th>Cumulative Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>30-40</td>
<td>6</td>
<td>26.1</td>
<td>26.1</td>
</tr>
<tr>
<td>40-50</td>
<td>10</td>
<td>43.5</td>
<td>69.6</td>
</tr>
<tr>
<td>50-60</td>
<td>7</td>
<td>30.4</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>23</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>
**Survey Question 3.** If so, how well did it help to prepare you for the real, live session? Nine (39%) reported being well prepared, 8 (34%) believed that they were somewhat prepared, 5 (21%) were already prepared, and 1 (4%) did not feel prepared at all.

**Survey Question 4.** How difficult was it to set up the technology required for using Elluminate? When asked about the difficulty in setting up the technology required for using Elluminate, 16 (69%) of the students believed that it was not difficult. Seven (30%) reported that it was somewhat difficult and none reported that it was very difficult.

**Survey Question 5.** Approximately how many times have you used Elluminate in the course? Most of the students nine (39%) used Elluminate at least 1-2 times. Six (26%) have used Elluminate 3-4 times, while three (13%) have used it 5-6 times. Two (9%) used it 7-8 times and 1 (4%) used it at least 9-10 times. Finally, another two (9%) reported using Elluminate 11 or more times.

**Survey Question 6.** Did you participate in all of the sessions conducted? When asked whether they participated in all of the Elluminate sessions conducted, a majority 21 (91%) of the students responded with yes and two (9%) reported no.

**Survey Question 7.** Describe in your own words how your class most often used Elluminate (group work, discussions, lectures, presentations, and a combination of activities). Students were asked to describe in their own words how the class used Elluminate. The majority of the responses revealed that the class most often used Elluminate for discussions, lectures, and presentations. Student descriptions are as follows:

1. Discussions and lectures
2. Presentations and discussions

3. The professors vary in their use of Elluminate. For the most part it has been used for discussions.

4. We use Elluminate as an opportunity to meet with the professor and answer any questions we may have about an assignment as a group as if we were together in a classroom.

5. Presentations and discussions

6. Discussions

7. Lectures

8. Lectures and discussion

9. Lectures and discussion

10. Combination

11. Our team met to discuss our group project

12. The Elluminate session is mostly used for class lectures, presentations, student feedback and discussion and most importantly on support for course assignments.

13. A combination of activities

14. We used it for group work and chats with the professor.

15. Lectures and presentations

16. A combination of activities

17. Lectures were used most of the time

18. Lectures and group presentations at the end of the course

19. Lectures, chats, presentations, discussions

20. Group work
**Survey Question 8.** Dialogue is described as a combination of words, actions, and ideas and other interactions between instructor and learner. Do you feel that the instructor’s use of Elluminate sessions enhanced the dialogue in the course? In response to whether or not the instructor’s use of Elluminate sessions enhanced the dialogue in the course, 18 (78%) said yes while 5 (22%) said no.

**Survey Question 9.** On average, about how many people were in your Elluminate session (include yourself and the instructor)? Fourteen (61%) of the students reported there were 10-15 people in the Elluminate session, while six (26%) reported that 16-20 people were in their session and 3 (13%) reported that 2-9 people were in the session. None reported 20 or more students were in the session.

**Survey Question 10.** The dialogue with my instructor during the Elluminate session would have been improved if the number of people would have been less, more, or did not have an impact. When asked if dialogue with the instructor during the Elluminate session would have been improved according to the number of people, 19 (83%) did not believe the number of people had an impact on dialogue with the instructor. Two (9%) believed dialogue would have been improved with less people another 2 (9%) believed the dialogue with the instructor during Elluminate sessions would have been improved with more people.

**Survey Question 11.** How useful were the following components in Elluminate in enhancing the dialogue in your course? Students were asked how the use of the following components in Elluminate enhanced the dialogue. A majority of students found the audio (20), hand raising (19), and text chat (18) to be very useful. Table 2 shows total number of students and how they report.
Table 2

*How Useful Were The Following Components In Elluminate In Enhancing The Dialogue In Your Course?*

<table>
<thead>
<tr>
<th>Tool</th>
<th>Very useful</th>
<th>Somewhat useful</th>
<th>Not useful</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Text Chat</td>
<td>18</td>
<td>4</td>
<td>1</td>
<td>23</td>
</tr>
<tr>
<td>Audio</td>
<td>20</td>
<td>3</td>
<td>0</td>
<td>23</td>
</tr>
<tr>
<td>Hand raising</td>
<td>19</td>
<td>4</td>
<td>0</td>
<td>23</td>
</tr>
<tr>
<td>Emoticons</td>
<td>14</td>
<td>6</td>
<td>3</td>
<td>23</td>
</tr>
<tr>
<td>Whiteboard</td>
<td>16</td>
<td>6</td>
<td>3</td>
<td>23</td>
</tr>
<tr>
<td>Application Sharing</td>
<td>13</td>
<td>8</td>
<td>2</td>
<td>23</td>
</tr>
</tbody>
</table>

**Question 12.** To what extent have you experienced technical problems with the following? Students were asked to report any technical problems in their experience with Elluminate. Students were further asked to address technical problems with specific tools in Elluminate. Student responses are displayed in Table 3 using total number of students to get an idea of their views. Students reported some minor problems with connecting to the session (56%) and audio (43%). While text chat (74%), hand raising (96%), and emoticons (96%) were not problematic. It is clear that application sharing (30%) was a major problem for some of the students.
Table 3

*To What Extent Have You Experienced Technical Problems With The Following?*

<table>
<thead>
<tr>
<th>Tool</th>
<th>No problem</th>
<th>Minor problem</th>
<th>Major problem</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connecting to the session</td>
<td>8</td>
<td>13</td>
<td>2</td>
<td>23</td>
</tr>
<tr>
<td>Text Chat</td>
<td>17</td>
<td>5</td>
<td>1</td>
<td>23</td>
</tr>
<tr>
<td>Audio</td>
<td>10</td>
<td>10</td>
<td>3</td>
<td>23</td>
</tr>
<tr>
<td>Hand raising</td>
<td>22</td>
<td>22</td>
<td>1</td>
<td>23</td>
</tr>
<tr>
<td>Emoticons</td>
<td>22</td>
<td>22</td>
<td>1</td>
<td>23</td>
</tr>
<tr>
<td>Whiteboard</td>
<td>12</td>
<td>12</td>
<td>4</td>
<td>23</td>
</tr>
<tr>
<td>Application Sharing</td>
<td>10</td>
<td>10</td>
<td>7</td>
<td>23</td>
</tr>
</tbody>
</table>

**Survey Question 13.** If you had technical problems, to what degree did the problems hinder your opportunity to dialogue with the instructor during the Elluminate session? Referring to the degree that technical problems hindered the opportunity to dialogue with the instructor during the Elluminate sessions, 8 (36%) stated it did not hinder me from dialogue, 11 (50%) reported that technical problems hindered me somewhat from dialogue, 2 (9%) found that it hindered me a lot from dialogue, and 1 (5%) became frustrated and did not dialogue.

**Survey Question 14.** The quality of dialogue with my instructor was enhanced by the Elluminate session(s). Seventeen (74%) believed the quality of the dialogue with the instructor was enhanced by the Elluminate session(s), 4 (17%) believed the dialogue was somewhat enhanced, and 2 (9%) did not believe that dialogue was enhanced.
Survey Question 15. Please rate the quality of the following features on Elluminate: Students were also asked to rate the quality of features on Elluminate. The following Table 4 presents the findings using total number of students. About half the students believed the presentation space (12), screen layout (12), feedback components (11), collaboration tools (12), and overall quality of the experience (11) were good, while eight (8) students believed the audio was fair.

Table 4

Quality of Elluminate Features as Reported by Students

<table>
<thead>
<tr>
<th>Feature</th>
<th>Poor</th>
<th>Fair</th>
<th>Good</th>
<th>Excellent</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presentation Space</td>
<td>1</td>
<td>6</td>
<td>12</td>
<td>4</td>
<td>23</td>
</tr>
<tr>
<td>Audio</td>
<td>2</td>
<td>8</td>
<td>7</td>
<td>6</td>
<td>23</td>
</tr>
<tr>
<td>Screen layout</td>
<td>0</td>
<td>6</td>
<td>12</td>
<td>5</td>
<td>23</td>
</tr>
<tr>
<td>Feedback Components (emoticons, applause)</td>
<td>1</td>
<td>2</td>
<td>11</td>
<td>9</td>
<td>23</td>
</tr>
<tr>
<td>Connection</td>
<td>2</td>
<td>6</td>
<td>9</td>
<td>6</td>
<td>23</td>
</tr>
<tr>
<td>Collaboration tools (whiteboard, rooms)</td>
<td>0</td>
<td>7</td>
<td>12</td>
<td>4</td>
<td>23</td>
</tr>
</tbody>
</table>

Survey Question 16. How do you feel about the use of Elluminate in your course? Students were asked how they felt about the use of Elluminate in the course. While many of the students enjoyed the use of Elluminate, other important themes emerged. Some students expressed concerns about instructors making better use of the
time during Elluminate sessions and technological problems that affected assignment deadlines. Responses were:

1. I enjoyed the sessions very much and look forward to using it again.
2. Very good. It is a very engaging and interactive tool.
3. I like Elluminate, I just wish that the professors would make better use of the time on Elluminate. I have had some professors that break you into groups and have you watching videos, etc. and then others just lecture as if you are in a classroom.
4. Each session has been met with some type of technological problem by classmates. Good tool for online purposes, but needs tweaking for ease of use.
5. Elluminate is ok. It provides another opportunity to connect with the instructor and fellow students through another format.
6. It helps break the ice with rigidness between the instructor and the student that an online course may pose. Provides and creates student-instructor interaction.
7. I recall it taking a while to connect to the Elluminate sessions, sometimes. Also, I recall it taking a while to send assignments or discussions. The computer was extremely slow at times. It affects the midnight deadline.
8. Elluminate is one of the best teaching sources/tools for learning.

Survey Question 17. If you could change one thing about Elluminate, what would it be? Students were asked, “If you could change one thing about Elluminate, what would it be”? Results show that majority of the students would change the audio/microphone and the ability to connect to the session. Descriptions are shown as follows:

1. The problems I encountered were as a result of my audio set.
2. I like the system but the one thing I wish it had the ability to see the students and professor. When you do distance learning that face to face connection is missing.

3. Improve audio performance.

4. Perhaps having a technical support specialist available for the first session.

5. The microphone usage was a challenge to me.

6. Easier to access, I have had minor problems but many students seem to have major issues connecting.

7. Allow copy and paste of text onto the whiteboard. Make the whiteboard user friendly and allow the sharing of files other than PowerPoint would help.

8. Everyone should be using the Mozilla Firefox browser instead of the Internet Explorer even the professor in order to access links that are shared during their presentations such as videos.

9. Connection stability and audio consistency.

10. Depending on the situation, we should not be penalized if there are technical problems.

11. Our professor was wonderful and I enjoyed the online course. I participated and it strengthened my collaborative still even more.

12. Make sure that everyone can connect. A lot of sessions require an extra 10-15 minutes or more until everyone is in the room and operational.

13. Connection problems, payout and ease of use.

**Survey Question 18.** For each of the following, please indicate by selecting a single response. Students were asked about organization, interaction, technical skills, discussions with peers, participation, feedback, the instructor’s approach, feeling
connected to the instructor, and whether they would take another course that used synchronous technology and to what extent each occurred in the course using frequently, sometimes, rarely, and not at all as shown in Table 5. In terms of the Elluminate session, 18 (78%) students reported the organization was logical and easy to follow frequently. About half of students (52%) believed the interaction with classmates and/or the instructor occurred frequently, while 11 (48%) believed that some of the interaction was effective using Elluminate. Another 13 (57%) believed that some technical knowledge and skills were required to master Elluminate. Fifteen students (65%) reported that discussions with peers were encouraged frequently.

An overwhelming number of students (87%) reported the instructor provided opportunities to participate frequently during Elluminate sessions. Additionally, 18 (78%) students reported the instructor provided constructive feedback frequently during Elluminate sessions. Also, many students (78%) believed the instructor’s approach to using Elluminate was effective. Seventeen (74%) of students believed using Elluminate made them feel connected to the instructor. Finally, 14 (61%) students indicated that they would take another course that offered synchronous technologies like Elluminate frequently.
Table 5

*To What Extent Did Each of the Following Occur in the Course Using Frequently, Sometimes, Rarely, and Not At All*

<table>
<thead>
<tr>
<th>Perception</th>
<th>Frequently</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>Not at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organization of the session was logical and easy to follow.</td>
<td>18</td>
<td>5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Interactions with classmates and/or the instructor were effective using Elluminate.</td>
<td>12</td>
<td>11</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Technical knowledge and skills were required to master Elluminate.</td>
<td>7</td>
<td>13</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Discussions with peers were encouraged.</td>
<td>15</td>
<td>6</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>The instructor provided opportunities to participate during Elluminate sessions.</td>
<td>20</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>The instructor provided constructive feedback during Elluminate sessions.</td>
<td>18</td>
<td>4</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>The instructor’s approach to using Elluminate was effective.</td>
<td>18</td>
<td>5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Using Elluminate made me feel connected to the instructor.</td>
<td>17</td>
<td>6</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>I would consider taking another course that used synchronous technologies like Elluminate.</td>
<td>14</td>
<td>7</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Instructor Perceptions of Synchronous Tools. There were 6 interview questions designed to address instructional strategies and perceptions of synchronous technology in online courses. The interviews were audio recorded using a digital recording device. The recordings were transcribed by the researcher and an assistant. After transcription was complete, the researcher and assistant reviewed notes together as a team and located
common themes expressed by the instructors for each question. The inclusion of an assistant was designed to provide strength and validity to the research. Each question was designed to allow the instructors to elaborate on their views and the methods used with synchronous technology. The interview obtained information about: (a) instructor background, (b) experience with online course development, (c) experience with synchronous online tools, (d) anticipation about experiences with course delivery, (e) pedagogical strategies used and (f) the instructor’s overall satisfaction regarding student performance, knowledge, interaction, communication and establishing a sense of community.

**Demographics and Background.** A total of four instructors were selected to complete interviews designed to gather data about their perceptions of synchronous tools (Elluminate) and instructional strategies in their online courses. All of the instructors are full-time faculty members teaching online courses for major and minor concentrations in Higher Education Leadership, Organizational Leadership, Educational Leadership, Healthcare Education, Conflict Resolution, and Instructional Technology and Distance Education.

**Instructor 1.** Female, full-time professor in Educational Leadership and Conflict Resolution. Former executive-level secondary school administrator and attorney with extensive experience in educational strategy and policy, school district transformation, state & federal legislative relations, labor & employee relations, bilingual-bicultural community relations, curriculum development and implementation. She has been teaching at the collegiate level for five years. Her educational philosophy follows:
I believe that everyone can learn. That we learn through applying the knowledge gathered from reading and researching new concepts and content, sharing this content with others, and expanding on our and others’ experiences. The dissemination of this new knowledge expands our own experience and helps us grow. Education is the foundation of a free society and a better world.

**Instructor 2.** Male, full-time professor of Higher Education Leadership, also serves as an applied dissertation advisor. He was a high school teacher for 10 years. For the last seventeen years, he has been teaching adult learners in various higher education positions for private colleges. He describes his educational philosophy as an evolving work in progress:

It has derived from over twenty years as an educator both with K-12 students and postsecondary students, traditional, and nontraditional age. My experience has enabled me to realize a few things about education. First, I think what one gets out of an education is directly proportional to what one has invested in it. Second, teachers learn as much from their students as they impart. Third, I believe that teaching is both an art and a science.

As a secondary school teacher, I was drawn to teaching because of my love for my subject matter, language arts. I wanted to share my love for and enthusiasm toward the English language, great works of literature, vocabulary, and composition with young people and foster an equal appreciation of this important subject with them. As a college professor, I take my responsibility in working with future teachers very seriously. I feel that there is no more revered or noble profession than that of teaching, and I feel passionately that my students understand the awesome responsibility that society will place upon them.

**Instructor 3.** Female, full-time professor and dissertation advisor in Organizational Leadership. Over her career, she has taught every level from pre-school through doctoral. In addition to her teaching career, she spent over eleven years in management positions for one of the nation’s largest healthcare organizations. Her educational philosophy focuses on autonomy:

I definitely adhere to the humanistic approach. This approach emphasizes that each individual has great freedom in directing his/her own future and a large capacity for achieving personal growth. In addition, learning must be hands-on
and meaningful.

**Instructor 4.** Female, full-time professor in Educational Leadership. She has more than 20 years of teaching experience, working with children and youth in public and private classrooms, secure juvenile justice facilities, and residential treatment settings. She currently teaches undergraduate and graduate students in education. Her educational philosophy follows:

An educator’s role is to guide and support students, provide continuity, introduce critical transformative pedagogy and common knowledge, provide access to the most reliable information, current research, technology, and multiple resources needed to construct learning. Students as critical thinkers will then answer their own questions with a new perspective and mindset. For students to learn, opportunities to discover practical skills in practical situations are critical.

As a social constructivist, I encourage students to build their own knowledge base. Students need to dialogue successfully, generate new ideas, develop collegial relationships, set realistic goals, take risks, recognize metacognition skills, and build a successful academic pathway.

**Question 1.** How many years have you used Elluminate in your courses?

Instructors were asked how many years that they have used Elluminate in their courses. All instructors responded that they had used Elluminate for four years, since its inception at the school of education.

**Question 2.** What instructional strategies did you use that you felt were MOST effective? Why? The instructors were asked to describe their most effective instructional strategies while using Elluminate during online sessions. The dominant theme was that instructors developed strategies to encourage interaction using group work and presentations. The responses follow:
Instructor 1:

I think the one that students like the most is when I would break them into small groups during the Elluminate session. Students discuss a scenario that was sent previously. They return to the full class and we discuss group views and opinions.

Instructor 2:

The major strategy that I try to incorporate in my philosophy is that if you are going to have synchronous instruction is to make it interactive. I thought that rather than just have students passively submit a paper or PowerPoint slides, I would use Elluminate for students to present to their peers. It increases academic engagement and collaborative learning.

Instructor 3:

I always start the session with allowing students to play, making them the moderator so that they can see what I am doing that I am not the “wizard of oz” behind the scene. I make them do presentations on Elluminate as well. With doctoral students, it is very likely that they will be teaching online and I want them to know as much as possible so we have training sessions for that as well and give them access to Elluminate so they can practice on their own.

Instructor 4:

In terms of meeting the needs of my students, I try to use group work but I also lecture as well. I try to also provide them with opportunities to meet in groups and work on projects. Unfortunately, it takes a lot of preparation, but at the end they have an opportunity to present their projects.

**Question 3.** What instructional strategies did you use that you felt were LEAST effective? Why? Instructors also discussed instructional strategies that they felt were least effective. Technological limits emerged as a dominant theme.

Instructors believed that the inability to implement additional technological applications such as a video or animation was a challenge and hindered the learning experience. Instructor 1 stated, “Using my own lecture style with PowerPoint slides have been least effective for the students.” Instructor 2 shows a video clip a couple of times during the semester and states the following:

There are different speed connections so by the time I close the clip in about 4 minutes, some of the students have not seen the clip. It is not very problematic but it would be nice for everyone to see the full clip at the same time.
While Instructor 3 believed that “doing presentations can be frustrating since one cannot use all of the bells and whistles that are a part of the power point slides. Animation, sound, links, and videos cannot be embedded into the slides during Elluminate sessions.” Instructor 4 voiced concerns with communication. Oftentimes, “I will post a lot of questions and try to get a response as one would expect in any didactic exchange to engage the student but it is a challenge.”

**Question 4.** What Elluminate tools did you feel were most useful to implement these strategies? Instructors were asked what tools they felt were most useful to implement the above-mentioned strategies. Frequent responses demonstrate that instructors used technological enhancements (emojis, camera, and whiteboard) to make communication more interactive and engaging.

Instructor responses were:

**Instructor 1:**

One thing that I think is very useful is having the student prepare and make presentations to the entire class. I think it is very helpful for all students. It is another way of learning a wider range of topics and information because they do not have the time to research everything during the course.

**Instructor 2:**

I enjoy using the emojis and polling feature—where I will ask yes or no questions and the student can vote. I can lock in their vote so they cannot change it once they see their peers vote. The results can be published to the board after the class has voted.

**Instructor 3:**

I try to use all of the tools available. The tools that are used depend on what you are doing and the lesson. I also use the cameras. I can have up to six at a time. If you are going to use technology, you better use all of it.
Instructor 4:

I like the whiteboard. There are a lot of features that seem to work well. I am not as skilled as others. I would like to use more features and become more tech-savvy. I will just need more time to learn it.

**Question 5.** Will you continue to use Elluminate in your upcoming courses?

Instructors were asked about whether they were satisfied with Elluminate and if they would continue to use it in their future classes. All four instructors stated they would as long as it was available and user-friendly.

Instructor 1:

O yes, I hope we can.

Instructor 2:

Yes, as long as we can use Elluminate in Blackboard, I will use it. If we move to another synchronous tool, I will not have any choice but to use it. But I have not had any problems with Elluminate 10.

Instructor 3:

Yes.

Instructor 4:

I will use it as long as we are instructed to do so. I have students around the world, sometimes you have to do it during the day. I have the luxury of being able to do it during the day if I need to. I have a couple of students in Greece. That is a nice recommendation for students to offer Elluminate during the day.

**Question 6.** Overall, how satisfied are you with the following: Instructors were asked about their satisfaction with student experience in the areas of performance, attainment of knowledge, interaction, communication, and a sense of community.

**Question 6.1.** The student’s performance in the course as a result of using Elluminate. The frequent themes were informal interaction and developing a stimulating, learning environment. Both areas increase student comfort with peers, instructor, and synchronous technology, thus, contributing to student growth in the online environment.

Responses were:
Instructor 1:

We are having our second Elluminate session, and this is the session where I send out a scenario and they have questions that they have to read and analyze on their own. Elluminate has this automatic group building feature so it is really not their assigned groups, as the teams have already been assigned to do their final presentation. They will be working with other students in the class, which is kind of interesting because I like that aspect of it, we will see how it goes tonight. That particular session is always very popular with the students and I think one of the things is that they get to talk as if they were in a classroom with other students from their class. I think that is what they really like about it.

Instructor 2:

Some of our best conversations are either before or after class when I stop recording. We have a live person so why should the students have to call or email me. I think that it is good to resolve immediate issues or concerns while both parties are online. It gives me a chance to feel like I am getting to know my students and I am teaching, as opposed to just reading their written work.

Instructor 3:

This term has been outstanding with students. They have to do a couple of presentations and the quality of the first presentation was amazing. I have students that are working with avatars and their presentations are just dynamite. I think that once they become comfortable, then it is like word processing. It doesn’t matter if it is the PC or Mac version, they basically do all of the same things but you have to find the different tools.

Instructor 4:

Middle of the road. I don’t find them as excited one way or the other, just a way to interact. Sometimes it is difficult, sometimes they get kicked out of the system, sometimes they are not able to log onto the system. I think that over time, it has gotten better.

**Question 6.2.** The overall attainment of knowledge by the students as a result of using Elluminate. Instructors recognized the importance of the students’ ability to obtain knowledge in a synchronous online environment. Dominant themes show that students attain knowledge through being more engaged with the technology, sharing with others, and receiving attention.

Instructor 1:
I think that it is a way of sharing. All of our students are professionals. They are teachers, directors, and superintendents and are not all in the same area of the country or the world. So there are all kinds of changing and different opinions and views.

Instructor 2:

Usually I have students who have done Elluminate. But they have not used all of the features before. There seems to be constantly one or two students who have issues with their microphone that I have to say “we can’t hear you” because it is never just me usually others can’t hear either. I don’t know if they are using a standalone mic or a headset but I tell them to call the help desk to get the issue resolved before they have to present at the end of the semester. Sometimes we can get by with just using the instant message if they have questions and the mic is not working.

I created a one-page handout on how to connect that I had never provided but I figured that I would be proactive and send to 1st semester students with screen shots of everything that they would have to click on in Elluminate.

Instructor 3:

Do they learn better, the statistics show that students learn the same things whether they are in an online environment or in a face to face classroom. However, I think they enjoy it much more and are more engaged with what is going on. There is movement and interaction as opposed to just hearing a lecture.

Instructor 4:

The current course that I am teaching is a research course and is quite extensive over 8 weeks, it is very long and detailed so they actually build a concept paper. It is a lot of work, let them revise, and then they get a final product. Whether this has anything to do with Elluminate, I can’t really say. Other than that they get a lot of attention.

**Question 6.3.** Your ability to interact with students in the course as a result of using Elluminate. Instructors recognize the importance of interaction in an online environment. Instructors elaborated more about their views on interaction and Elluminate. Two prevalent themes were increasing sessions and technology. Increasing sessions create opportunity to address individual and group issues. There is satisfaction
with the ability to communicate with students using the technology. However, lack of technical knowledge can have an impact on the amount of time it takes to respond to students.

Responses were:

Instructor 1:

I think we should have more sessions, although I am cautious because you know a lot of students take asynchronous courses so that they don’t have to be in class, go to class, so I spread it out, what I want to do with this course is maybe take a couple more of the postings and open them up and kind of say okay, you have a choice in this one.

Instructor 2:

I am satisfied as opposed to just reading and using the discussion board course messages, I think that it has been effective in my ability to communicate with students verbally. I have used chat in some courses where everyone was chatting at once. By the time I got it the way I wanted, I had missed some postings. I do not find it as effective.

Instructor 3:

Without it, we would lose all of the important adult education aspects of it. We have to do it. I will even schedule individual sessions with students to talk about some things. I have another session that I call group therapy for groups that are not working well together. We get on and talk about the dynamics of the group and how it could be improved. For me, if the students don’t learn then I have failed. I will use every single tool that I have at my disposal to make it easier for them.

Instructor 4:

I am not as quick on the response to the students due to the many steps in Elluminate. I would like to have more instruction and support. Because I think there are many features that could be used that I don’t use, I will admit that and I have said that many times. You just have to take the time and put it to practice.

Question 6.4. The ease for students to communicate with each other using Elluminate. Instructors were asked about their overall satisfaction with the ease for students to communicate with each other using Elluminate. Instructors elaborated on their
views about learner to learner communication. There were not any prevalent themes in this section. Essentially, instructors believe communication can help facilitate learning.

Instructor 1:
Students can communicate during the group breakout sessions without any problem. Usually I go and look at the bio so that I can have a little sketch about each one of the students and I try to match up interests, like areas that they teach. Maybe people have things in common.

Instructor 2:
I am not an expert but I want to get to the next level and use recorded PowerPoint sessions where you embed your audio. Send the students and tell students to view before the session and be prepared. You have 3 questions that you want to guide the discussion. You can really get into some critical problem-solving, real sophisticated conversation as opposed to trying to explain ten chapters out of the textbook.

Instructor 3:
Most people are not auditory learners. Students communicate with each other from the various tools. You can set up discussions in Elluminate. Students are all over the world and can get different perspectives.”

Instructor 4:
When students are preparing presentations and have to meet, communication and scheduling can be a challenge, but we work it out.

**Question 6.5.** The sense of community felt between the students as a result of using Elluminate. For the final question, instructors were asked about the sense of community felt between the students as a result of using Elluminate. The important theme is that technology can help increase engagement and interaction among students.

Responses were:

Instructor 1:
Students recognize and respond to each other from other online classes and I believe that builds a sense of community. Also, I think that once they start responding to each other, I try to get them to not be critical but to learn from each other. Maybe you didn’t get a chance to read all of the chapters and another person can say well, you might want to consider something additional from the text. That helps you expand in your own knowledge. I think it is a part of learning.
Instructor 2:

That should start before Elluminate with the very first communication that the instructor sends out, I require that all students include a pic and biographical sketch so that people can get a sense of who they are talking to during the Elluminate session.

Instructor 3:

If we are an institution that teaches online and insists on teaching most of its classes online, then we have an obligation to the students to make sure that our faculty are engaged and know how to use the tools that they are given.

Instructor 4:

You cannot meet everyone’s needs but you give the students an opportunity to build the skills. For instructors that do not use Elluminate, it can become like a correspondence course. Send me your assignments and you give them a grade so they do not know what others are doing. When my students finish their action research project, in addition to presenting it, they have to upload the abstract so that others can see. Otherwise, the student is working in isolation.

Summary

This chapter presented findings from the completion of 23 student surveys and 4 instructors. Questions were designed to gather perceptions and attitudes about current technology used in the online classroom. The survey addressed practice sessions, how the technology was used, dialogue, technical issues, quality of the tools and features, overall organization, feelings about the technology, and changes to the technology. The interview focused on instructional strategies and overall satisfaction, specifically with performance, overall attainment of knowledge, interaction, communication, and sense of community. Dominant themes were dialogue, interaction, and technical knowledge for both students and instructors. The next chapter will discuss and interpret the findings as related to the themes.
Chapter 5: Discussion

This chapter discusses the results presented from Chapter 4. Graduate student surveys and instructor interviews were the basis for examining perceptions of synchronous tools in the online environment. The methods used were designed to gather views from the perspectives of current students and instructors. The results relate to the research questions: What are student perceptions of synchronous tools in online courses? and What are instructor perceptions of synchronous tools in online courses?

Summary of Findings

This study reveals that graduate students are somewhat satisfied and comfortable about their overall experiences with synchronous technology in online courses. However, there are some challenging issues with technical interface areas and concerns about interaction. From the instructional perspective, the results revealed satisfaction with the synchronous technology. But, instructors also believed that such satisfaction was based on their ability to engage the student and how they used synchronous tools to enhance dialogue and interaction. Both perspectives are consistent with the literature review. The next sections of this chapter will discuss the findings in more detail.

Interpretation of Findings

Dialogue and interaction. Transactional distance is impacted by dialogue and interaction in the teaching/learning environment. Environmental factors such as technical issues can affect dialogue and interaction in an online course. Practice sessions can be designed to address technical problems prior to an official instructional session. Research has shown that as student experience with synchronous technology increases, anxiety toward communicating in this environment decreases (Groen, Tworek, & Soos-Gonczol,
During a practice session, students can acquire knowledge about how to use the computer equipment; configure any plug-ins and perform the audio set-up wizard; and how to orient themselves to the interface. Any problems that occur can be addressed at this time.

**Group size.** Another issue that could generate concern is group size during the synchronous session. Instructors use group work as a part of their instructional curriculum to encourage dialogue and foster peer interaction. The size of the group could have an impact on the amount of dialogue because there will be less dialogue between an instructor and individual learner as the group size increases. However, the majority of students (83%) did not believe that the number of people had an impact on dialogue. According to Stewart (2005), this may be due in part to the fact that the synchronous technology is equipped with hand-raising and direct messaging tools. Furthermore, both tools allow students to indicate they have a question or comment without directly interrupting the instructional flow no matter how large the group.

**Instructor-learner relationship.** Social presence involves connection (Tu & McIsaac, 2002), rapport building (Wolcott, 1996) and instructional immediacy (Lobry de Bruyn, 2004). All of these elements are equally important in the student-instructor relationship. Thus, the instructor has to establish social presence, enhancing dialogue. These areas have to be initiated through interaction. Instructors revealed a number of approaches during their synchronous sessions.

Instructor 1 used group breakout sessions where students discussed an issue as a group and responded to the instructor. Instructor 2 preferred using the emoticons and polling features as a casual communication tool (Tu & McIsaac, 2005). However,
Instructor 4 did not use as many of the features as other instructors due to lack of training. But with experience, she plans to implement more ways of interacting with the student. Essentially, an instructor’s ability to create or develop social presence is enhanced by learning to use the technology effectively. Hillman et al. (1994) discussed the importance of the technological interface and its impact on the learning experience. The instructor and student have to operate and navigate the technological medium while learning the instructional content. Thus, there is a two-fold process.

The organization of the synchronous web-based computer system (SWBCS) has to be designed with a user-friendly format where both instructors and students can access the content in an efficient manner. Both students and instructors expressed their frustration with some technical components of the SWBCS. The students had some problems with connecting to the session and audio. Instructor concerns included the inability to use or upload all of the videos during the synchronous sessions in a timely manner. Additionally, animation, sound, and web links cannot be embedded into the PowerPoint presentations. While technical problems are a part of any computer system, the idea is to eliminate as many as possible.

**Learner-interface relationship.** There has been some research conducted regarding the learner-interface relationship (Hillman et al., 1994). The medium and the way it is used does and can have an impact in the synchronous online environment. Meaningful interactions cannot occur without technological knowledge during online sessions. The three types of interaction: instructor-learner, learner-learner, and learner-content cannot take place without the interface or medium. According to Levin, Kim, and Riel (1990) successful network communities have to meet at least four of the five
criteria. First, members of the group are people who cannot meet face-to-face because of distance; thus, they have to work on collaborative and shared tasks. Second, the group tasks are clearly defined. Third, participants must have appropriate technical skills. Fourth, there has to be common responsibility among group members to complete the task. Finally, there has to be good leadership, coordination, and evaluation of the activities.

**Learner-learner relationship.** Learner-learner dialogue and interaction were not a focus of this study. However, instructors revealed that it is a part of their instructional design. All of the instructors use group work and presentations to enhance and encourage peer relationships between the students. Instructors will bring students together in different locations with various backgrounds as opposed to those who are in the same area. A majority of students (65%) reported that discussions between peers were encouraged, and another 52% believed interaction with classmates and the instructor were effective during the synchronous sessions. The learner-learner communication can build relationships that foster support, interaction, and dialogue among the students. Oftentimes, students will recognize each other from previous courses and that will alleviate some apprehension. One instructor required that students include a picture and biographical sketch so that each person will know who he or she is talking to during discussions.

**Learner-content relationship.** Learner-content relationships were not a part of this study. However, instructors utilize the SWBCS to present and distribute content to the student. Instructors used the whiteboard to present slides and lectures using the duplex audio feature within the SWBCS. Another feature that supplements the learner-
content relationship was the ability to record sessions. Students can review and listen to previous sessions at any time. The SWBCS allows the student to interact with the content during the instructor lecture or in a flexible manner on his or her own time.

**Context of Findings**

**Relationship to existing literature.** The findings show a convergent relationship with the existing literature. SWBCS offers tools that instructors use as a part of their instructional strategy. The research showed that instructors with more technological experience utilized the tools in a more effective manner (Morera-Guitierrez & Murphy, 2000). From the student perspective, previous studies reveal positive experiences with synchronous technology (Ng, 2007), with some concerns and confusion about technical issues (Disbrow, 2008).

**Implications of Findings**

**Theoretical implications.** The research questions and their relationship to the theoretical constructs of this study will be discussed. Transactional distance and social presence theories served as the over-arching theories. To review, transactional distance has several tenets: (a) transactional distance is a pedagogical phenomenon and not just a matter of geographic distance; (b) transactional distance is relative, not absolute; and (c) distance education is generally the subset of educational events in which the separation of teacher and learner is so significant that it affects their behavior in major ways (Moore, 1997; Stewart, 2005).

Social presence theory recognizes that social factors can influence communication and experience in online classroom environments. Interaction plays a significant role when trying to increase social presence. Moore (1989) discussed three types of
interaction: learner-content, learner-instructor, and learner-learner. A fourth interaction, as suggested by Hillman et al., (1994) is learner-interface interaction. This study focused on learner-instructor and learner-interface interaction.

**Methodological implications.** The methodological approach was designed to address research questions. The methods used were the survey and interview. The student survey was adequate and allowed for analysis of practice sessions, usage and frequency of the technology, dialogue, technical issues, quality, amount, and group size. Each of the areas on the survey should be considered for future examination. The instructor interview served to gather views on the technology and its relationship with instructional strategies. The interview allowed the researcher an opportunity to determine that each instructor focused on andragogy, student-centeredness, and constructivism.

**Applied implications.** The interaction-interface or medium deserves some consideration. The medium requires application of technological skills. The SWBCS is an advanced computer system that has features that instructors use to enhance dialogue and interaction. Instructors use many of the features frequently. Instructors use the whiteboard, the audio duplex system, direct messaging, and emoticons as presentation tools and to communicate and enhance interaction.

**Limitations of Study**

In Chapter 3, limitations were discussed as specific to one organizational setting, individual courses, participant’s computer knowledge, any bias, and technical issues. This research study utilized student surveys and instructor interviews to gather perceptions about synchronous technology in online courses. The assessment instruments selected were appropriate, reliable, and valid. For future studies, the inclusion of real-time
observation during synchronous sessions and student interviews would provide more detail and allow participants to expound beyond the survey.

As far as sampling, there were only 4 instructors interviewed for the study, presenting a low sample. The small sample allowed the researcher to maintain some level of control and did not have an effect on the findings. The study just focused on instructors who utilize synchronous technology in their online courses. There are instructors who do not use synchronous activities in their respective courses, and perhaps their perceptions would have provided another perspective. However, this was beyond the scope of the present study.

**Future Directions**

This section will discuss issues that suggest future research directions. While the purpose of this study was to analyze synchronous technology in distance courses from a student and instructor perspective, there are other variables that could be considered for future research. In Chapter 2, attrition and persistence in distance education was discussed. Currently, the attrition rate for distance courses is reportedly more than 40% (Carr & Ledwith, 2000). Students drop out of face-to-face and distance courses for a number of reasons.

But researchers are in agreement that online students experience more isolation and alienation. Therefore, engagement is a crucial part of the student online experience. Instructors must have the necessary skills to utilize the existing technology and create a positive learning environment. Instructors have to be trained in a way that is consistent with a new technological paradigm. University leaders have to focus on the current and future needs of a changing student population. An empirical study could examine how
instructors are trained to use synchronous technology.

There are other areas that should be considered for future directions. Studies could compare and examine student and instructor perceptions in different locations and settings (university and community college); compare undergraduate and graduate student perceptions of synchronous technology; explore themes such as communication, fear, and anxiety regarding the technology; and seek perspectives from the experts who design the technology and the educational leaders who are responsible for making decisions about implementation of new technologies. Such studies could be developed using various methods. Methodological approaches could include a longitudinal or experimental design examined over several semesters or academic years.

**Conclusion**

This study examined instructor and student views about synchronous technology in online courses. Quantitative and qualitative methods were used in the form of a survey and interview. The study revealed that the way instructors use the SWBCS is based on their experience and comfort with the technology. Essentially, instructors use various tools and features as a part of their strategy such as duplex audio, direct messaging, and the whiteboard. These tools were used frequently because of the ease and comfort from the instructor and student perspective.

However, it is important to recognize and consider that the instructor’s ability to use these tools can have a direct impact on the student’s learning experience. Learning is shared through a collaborative process. An understanding of transactional distance and social presence theory moves beyond geographical location. The SWBCS interface is
sophisticated and requires appropriate training. The combination of training and skill will provide a positive learning experience for the student and instructor.
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Appendix A

Student Survey
Perceptions of Synchronous Tools in Online Learning Survey (Students)

Directions
As indicated on the attached participation letter, I am a doctoral candidate at the Fischler School of Education at Nova Southeastern University. As part of my dissertation, I am analyzing the nature of synchronous web-based software such as Elluminate in online courses.

If you choose to participate, you will answer a brief web-based survey with no personal identifiers. By taking part in this research, you will be providing information that may be of interest to administrators and instructors who teach online courses. There is a minimal risk of loss of time for participation in this research study. However, the survey has been designed to be completed within 10-15 minutes.

The results of the study will be published in a dissertation. The summary results will not include your name or other information that would personally identify you in any way.

Thank you!

Section I. Demographics and Background Information.

1. What is your gender?
   - Male
   - Female

2. What is your age range?
   - 20-30
   - 30-40
   - 40-50
3. Please select your student status
   - Undergraduate
   - Graduate
   - Non-degree seeking
   - Certificate seeking

4. How many distance education (online) courses have you taken prior to this semester?
   - 0
   - 1
   - 2
   - 3
   - 4 or more

5. Were you aware this course requires/offers a synchronous (real-time, online) component?
   - Yes
   - No

6. How clear was the course instructions about the technology used in this course?
   - Clear
   - Not clear
   - Somewhat clear
   - Very clear

Section II. Experience with Synchronous Technology. Please click on the appropriate response.

1. Have you ever taken an online course that used synchronous software such as chat, video, conferencing, or two-way radio?
   - Yes
   - No

2. Did you participate in an Elluminate practice session?
   - Yes
   - No

3. If so how well did it help to prepare you for the real, live session?
   - It did not prepare me at all (still uncomfortable)
   - Somewhat prepared
   - Well prepared
   - I was already prepared

4. How difficult was it to set up the technology required for using the synchronous software for Elluminate Live?
Not difficult
Somewhat difficult
Very difficult

5. Approximately how many times did you use Elluminate Live! in the course?
   0  1-2  3-4  5-6  7-8  9-10  11+

6. Did you participate in all of the sessions conducted?
   Yes  No

7. Describe in your own words how your class most often used Elluminate Live! (group work, discussions, lectures, presentations, and a combination of activities)

8. Dialogue is described as a combination of words, actions, and ideas and other interactions between instructor and learner. Do you feel that the instructor’s use of Elluminate sessions enhanced the dialogue in the course?
   Yes  No  Somewhat

9. On average, about how many people were in your Elluminate session (include yourself and the instructor)?
   2-9  10-15  16-20  20+

10. The dialogue with my instructor during the Elluminate session would have been improved if the number of people would have been
    Less  More  the number of people did not have an impact on dialogue with my instructor

11. How useful were the following components of Elluminate Live in enhancing the dialogue in your course?
    Not useful  Somewhat useful  Very useful
    Text chat
    Audio
    Hand rising
    Emoticons (smiley faces)
    Whiteboard
    Application sharing
12. To what extent have you experienced technical problems with the following?

<table>
<thead>
<tr>
<th></th>
<th>No problem</th>
<th>Minor problem</th>
<th>Major problem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connecting to the session</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Text chat</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Audio</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hand rising</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emoticons (smiley faces)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whiteboard</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Application sharing</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

13. If you had technical problems, to what degree did the problems hinder your opportunity to dialogue with the instructor during the Elluminate session?

- It didn’t hinder me from dialogue
- It hindered me somewhat from dialogue
- It hindered me a lot from dialogue
- I became frustrated and didn’t dialogue

14. The quality of dialogue with my instructor was enhanced by the Elluminate session(s).

- No
- Yes
- Somewhat
15. Please rate the quality of the following features on Elluminate:

<table>
<thead>
<tr>
<th>Excellent</th>
<th>Poor</th>
<th>Fair</th>
<th>Good</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presentation space</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Audio</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Screen layout</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feedback components (emoticons, applause, hand raising, etc.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall quality of experience</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

16. How do you feel about the use of Elluminate in your course?

17. If you could change one thing about Elluminate, what would it be?

18. For each of the following items, please indicate by selecting a single response option.

<table>
<thead>
<tr>
<th>Rarely</th>
<th>Sometimes</th>
<th>Frequently</th>
<th>Not at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organization of the session was logical and easy to follow.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interactions with classmates and/or the instructor were effective using Elluminate.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technical knowledge and skills were required to master Elluminate.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discussions with peers were encouraged.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The instructor provided opportunities to participate during Elluminate sessions.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The instructor provided constructive feedback during Elluminate sessions.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The instructor’s approach to using Elluminate was effective.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Using Elluminate made me feel connected to the instructor.

I would consider taking another course that used synchronous technologies like Elluminate.

Appendix B

Faculty Interview Protocol
Instructor Interview Protocol

1. How many years have you used Elluminate in your courses?

2. What instructional strategies did you use that you felt were MOST effective? Why?

3. What instructional strategies did you use that you felt were LEAST effective? Why?

4. What Elluminate tools did you feel were most useful to implement these strategies?

5. Will you continue to use Elluminate in your upcoming courses?

6. Overall, how satisfied are you with:

1. The student’s performance in the course as a result of using Elluminate.

2. The overall attainment of knowledge by the students as a result of using Elluminate.

3. Your ability to interact with students in the course as a result of using Elluminate.

4. The ease for students to communicate with each other using Elluminate.

5. The sense of community felt between the students as a result of using Elluminate.

Appendix C

Introduction Letter (Faculty)
Dear Professor:

I am a doctoral student and am conducting a research study that examines the impact of synchronous technology (Elluminate) in a web-based course. I am requesting your assistance. The results of the study may be reviewed by university administrators as a way to make recommendations to improve student and instructor experience with new technology in online courses.

The study will involve the completion of both an interview to gather your perceptions as an instructor in the course. The interview will take about 45 minutes to an hour to complete.

Attached to the email, you will find a consent form for your review. It is designed to address your rights and responsibilities if you choose to participate in this study. Please sign and return to me via email.

If you prefer to meet in person to discuss and address any questions or concerns, please contact me via email.

Natalyn Jones-Ferguson
Principal Investigator
Appendix D

Introduction Letter (Students)
Dear Student:

I am a doctoral student at and am conducting a research study that examines the impact of synchronous technology (Elluminate) in a web-based course. I am requesting your assistance. The results of the study may be reviewed by university administrators as a way to make recommendations to improve student and instructor experience with new technology in online courses.

The study will involve the completion of a survey to gather your perceptions as a current student enrolled in a course that uses Elluminate as a form of interaction. The survey will take about 10-15 minutes to complete.

Attached to the email, you will find a link to the survey for your review. When you click on the survey, you will receive a participation letter. It is designed to address your rights and responsibilities if you choose to participate in this study.

If there are any questions or concerns, please contact me via email.

Natolyn Jones-Ferguson
Principal Investigator