THE EFFECT DIFFERENT SYNCHRONOUS COMPUTER MEDIUMS HAVE ON

DISTANCE EDUCATION GRADUATE STUDENTS' SENSE OF COMMUNITY

AND FEELINGS OF LONELINESS

by

Lorene R. Heuvelman-Hutchinson

Liberty University

A Dissertation Presented in Partial Fulfillment

Of the Requirements for the Degree

Doctor of Education

Liberty University

March, 2012

THE EFFECT DIFFERENT SYNCHRONOUS COMPUTER MEDIUMS HAVE ON

DISTANCE EDUCATION GRADUATE STUDENTS' SENSE OF COMMUNITY

AND FEELINGS OF LONELINESS

By Lorene R. Heuvelman-Hutchinson

A Dissertation Presented in Partial Fulfillment
Of the Requirement for the Degree
Doctor of Education

Liberty University, Lynchburg, VA
March, 2012

APPROVED BY:

_____
Dr. Amanda Rockinson-Szapkiw, Committee Chair

_____
Dr. Sharon D. Michael-Chadwell, Committee

_____
Dr. Melanie Dewitt, Committee

_____
Dr. Scott Watson, Associate Dean, Advanced Programs

ABSTRACT

Lorene R. Heuvelman-Hutchinson. THE EFFECT DIFFERENT SYNCHRONOUS COMPUTER MEDIUMS HAVE ON DISTANCE EDUCATION GRADUATE STUDENTS' SENSE OF COMMUNITY AND FEELINGS OF LONELINESS

Because distance education is such a rapidly developing educational venue, knowing

what factors impact success must be known. Loneliness and sense of connectedness, or

community, are issues facing graduate distance education students. These issues may

influence retention. The theoretical framework of a Community of Practice assisted in

understanding the development of community using computer-mediated communication

(CMC) systems. The research questions answered included whether the type of

synchronous CMC used (text- or video-based) could impact loneliness and community

from a distance. An experimental design (randomized subjects, control group, posttest

only) was used with distance education graduate students to address the research

questions. Hypotheses were not supported. Qualitative analysis of open-ended questions

found support for development of community.

Descriptors: Community; Computer-mediated communication; Connectedness; Distance
education; Loneliness; Community of practice.

DEDICATION

This dissertation is dedicated to my dad, George D. Heuvelman, who taught me the value of persistence and hard work. My father was one of my greatest cheerleaders. When I realized he would not be here to see this through to the end, due to his death in February 2012, I was devastated. I completed this knowing my dad expected me to finish strong and I could not let him down. I miss you daddy. Your little girl did it and I expect you to be there with me.

ACKNOWLEDGEMENTS

I think the words "thank you" are not strong enough to express my gratitude to the many people who made this lifelong goal a reality. First and foremost, I need to mention the Lord. Without the strength of Christ, I would have given up long ago. I am eternally grateful for His guidance and help through this process. To Dr. Amanda Rockinson-Szapkiw, I cannot thank you enough for your quick replies, your challenging comments, and your dedication to me as a student. I look forward to calling you colleague, but more importantly, friend. I have learned from you in so many ways but the poignant lesson came from watching you be an example of Christ-like compassion. Vygotsky would be proud to call you my "more knowledgeable other." My dedicated committee is also due my gratitude. To Drs. Sharon Michael-Chadwell and, sweet friend and colleague, Melanie Dewitt, I appreciated your time, support, and comments to make me a better student and a more competent professional.

To my husband, Greg Hutchinson, you have been a quiet force of encouragement. You took the kids so I could write, did the dishes so I would not focus on them, and became an interim chauffeur for the kids. Thank you. To my kids, words cannot describe how blessed I am to have you as my supporters. I have neglected my responsibilities in the home and you love me just the same. I remember saying often, "Don't interrupt me unless there is blood!" Thank you for helping me accomplish so much. It is now over, so let's have a family game night – every night – to make up for all of the missed nights of fun.

To my mom and my brother, Don, I was motivated to finish this because of your encouragement and pride. I know this means as much to me as it does to both of you. And to my dear friends who have listened to me whine about not being able to participate

in activities or hang out because I had to "go home and write." You listened when I talked about my study and you continued to encourage me to keep on even when I was exhausted.

My research was really about the importance of social relationships when studying at a distance and I was blessed to have found a great group of people (RATS) from which to glean knowledge, support, research help, volunteer facilitators, and friends. I am in awe of how much you guys mean to me and it is because of you (and a secret Facebook group!) that I did not feel isolated and alone in this process.

Finally, those in my study, I could not have completed this without your willingness to be participants and facilitators. Your interactions with others and your feedback about the process will make a difference for future distance education students. I am indebted to each of you.

Table of Contents

LIST OF TABLES

CHAPTER ONE: INTRODUCTION

Universities' ever increasing capacity to economically and extensively employ

advanced electronic systems to deliver education comes with challenge to maintain the

same standards of educational support as found on traditional campuses. The concept of

community within a physical or virtual classroom has long been studied as a key

component to supporting learning (Rovai, 2002c), and the literature has well established

it is easier to develop community in a traditional environment than a distance

environment (Rovai, 2002c; Thompson & MacDonald, 2005). A sense of community

develops when an individual transforms into a group member by sharing the group's

values and expectations, experiencing a sense of belonging, and sharing a commitment to

the group. In other words, Rovai (2002a) contends, community exists when there is

connectedness and commonality of learning expectations among group members. Weak

communities exist when members are disconnected, overly competitive, and filled with

mistrust and social cliques (Rovai, 2002c). Without a sense of community, individuals

may feel a sense of loneliness, and meaningful dialogue may be lacking in richness,

which could reduce learning outcomes (Thompson & MacDonald, 2005).

The challenge for universities offering distance education programs is to find the

most efficient and effective manner to create a sense of community and decrease feelings

of loneliness. With technological advancements, universities have a myriad of

technologies they can use to facilitate the development of a sense of community.

According to Luppicini (2007), computer-mediated communication (CMC) is the

"communications, mediated by interconnected computers, between individuals or groups

separated in space and/or time" (p. 142). These communications can be synchronous or

asynchronous, text- or video-based, highly interactive, and multidirectional. Determining

the most effective combination of technologies continues to be studied (Johnson, 2006; Rovai, 2002c; Tolmie & Boyle, 2000; Wang & Woo, 2007). The focus of this quantitative study was to assess the effect of using synchronous CMC systems (text- and video-based) with graduate students in asynchronous distance education courses on students' perceptions of loneliness and sense of community.

The focus of this chapter is to provide a rationale for studying the development of a sense of community, how community relates to loneliness, and how the sociability of CMC impacts the development of community at a distance. The theoretical framework of the Community of Practice (CoP) will provide a lens from which to view the importance of relationship in the learning environment. The significance of this research and its purpose was in determining the most effective synchronous CMC to facilitate peer interactions to meet the social needs of distance education graduate students. The results could impact perseverance to graduation for distance education graduate students (Shea, Li, & Pickett, 2006) and increase retention for universities (Dawson, 2006).

Background

Humans are innately social beings. Hutcheson (1730) wrote, in *Logic, Metaphysics, and the Natural Sociability of Mankind*, that man's essence is interaction with others. Hutcheson penned,

> social life is natural to man ... that we need the help of others to avoid almost all
> the human evils ... and we need others to such an extent that we are not able even
> to live, let alone to live well, without the company and help of others.
> [Additionally,] there is resourcefulness in men, and abilities of mind and body, by
> which they can mutually help or hinder one another... And hence it is clear that
> God has fashioned us for social life (para 13).

From an etymological standpoint, the word social means a variety of things, such as *united, companion,* and *follower* (Barnhart, 1995). The word social implies associating one's self or allying one's self with the intent to develop union with others of like interests. Viewing it through a social constructivist lens, it is the process by which individuals participate in the construction of a shared sense of understanding with others (Bronack et al., 2008)

Humans were fashioned for social interactions and have a desire to engage others in an attempt to understand the world and those in it. Socializing with others is an integral part of learning. Social learning theorists, such as Vygotsky (1978) and Bandura (1977), found individuals learn by watching others, by trial and error, and then by engaging in similar activities. Early in child development, children explore their world individually. While developing socially, children parallel play and learn others are interesting and worthy to be investigated (Parten, 1932). As emotional development proceeds, children begin to see the benefits of interacting and cooperating with others (Vygotsky, 1976). Interactive play becomes essential for learning. Children, and possibly even adults, develop through the internalization of concepts, development of abstract logic, and assimilation of social rules through interactions with others (Cheok, Ishii, Osada, Fernando, & Merritt, 2008; Vygotsky, 1978).

Looking carefully at the 21st century K-12 classroom, current designs focus on engaging students with one another to enhance social learning opportunities (HMFH Architects, 1998). Technology allows students to interact and collaborate with others in the classroom while, at the same time, collaborating with other students in neighboring communities and other countries. In like manner, universities validate the social needs of students (Brandes, 2006) as classrooms have newly designed workstations with

rectangular tables and moveable seating to allow for interactivity between students during classroom discussions (Leiboff, n.d.). The essence of education is interaction (Vygotsky, 1978), but not just with an academic agenda.

University students form study groups and relationships form naturally with many classmates, maintaining social contact even after the initial introductory course in which they met is over (Glomb, Midenhall, Mason, & Salzberg, 2009; Rovai, Baker, & Cox, 2008). Clearly, social relationships are an important characteristic of the learning experience for the traditional college student on both an educational and personal level (Strage, 2008). This is also true for another population increasingly inhabiting universities, nontraditional students.

Nontraditional students can be older students, single parents, or professionals; each having their own reasons for enrolling in distance education (Browning, 1999; Summers, Waigandt, & Whittaker, 2005). Although nontraditional students do enroll in face-to-face, or traditional, university courses, they more readily populate the online classroom, which is the fastest growing form of higher education (Allen & Seaman, 2007). The University of Phoenix, an online institution with an enrollment of nearly 225,000 students, topped the enrollment data for the largest degree-granting colleges and universities, according to the U.S. Department of Education's National Center for Education Statistics [NCES] (2009); the second largest institution, Miami Dade, with approximately 54,000 students enrolled in its many programs. The NCES also reported 56% of all degree-granting institutions are offering distance education courses (Waits & Lewis, 2003).

Enrollment in a traditional or distance education program does not necessarily indicate students will complete their program of study. Less than 60% of traditional

students at four-year colleges complete a degree within six years (Hess, Schneider, Kelly, & Carey, 2009), while 70% of nontraditional students enrolled in an online program dropped out (Meister, 2002). While nontraditional students dropped out for a variety of reasons, which included finances, employment, academic integration, interpersonal relationships, and time management (Martinez, 2003; Moody, 2004; Nash, 2005), lack of social integration and isolation is frequently cited as a reason for attrition, especially in the online environment (Gunawardena et al.,2009; Park & Choi, 2009; Rovai, 2003). This indicates nontraditional college students are also in need of relationships and social interactions just as traditional students are (Brandes, 2006) and, without such interaction may experience loneliness which may ultimately result in attrition (Hartley, Gill, Walters, Bryant, & Carter, 2001). Moreover, for distance education students, community is just as important as it is for those students in traditional settings.

Without community, students may feel peripheral to the student body and the university (O'Donnell & Tobbell, 2007), disconnected from other students, resulting in a lack of persistence to graduation (Moore & Kearsley, 1996), and isolated and disconnected (Hill, 2002). In traditional face-to-face programs, a sense of community begins to develop when members feel as though other members really care about them. In the online environment this is described as social presence. Engaging others socially within a learning community of practice tends to increase familiarity and closeness to promote interaction and social presence (Charalambos, Michalinos, & Chamberlain, 2004; Falvo & Solloway, 2004, Palloff & Pratt, 1999), which Johnson (2001) adds will facilitate discussions to increase learning. Discussion, or dialogue, amongst group members will expose gaps in members' learning, and according to Rovai (2002a),

discussions will not be candid or open without individuals feeling safe and trusting of others within the group.

Loneliness and Community

Nontraditional distance education graduate students, who are learning at a distance and feeling a lack of social integration, are at high risk for isolation, loneliness, and, as a consequence, attrition (Moore & Kearsley, 2005). Loneliness occurs when there are limited opportunities for interactions and those interactions lack sociability, which is described as the *realness* of an online encounter (Kreijens, Kirschner, & Jochems, 2002) and even how closely it mimics face-to-face contact (Rourke, Anderson, Garrison, & Archer, 2001). When opportunities for sociable interactions are available, connectedness can develop (Gao, Dai, Fan, & Kang, 2010). Intertwining social interactions amongst educational endeavors creates connections (Hill, 2002).

Socialization and Community

Socialization begins with a sense of community. The term community brings with it many different definitions, but Lave and Wagner (1998) define communities as groups of individuals who are engaging in a process of learning collectively in a shared domain. Although this definition of community seems all-inclusive, it highlights that the members and the group's interactions define community. This is exactly the point; members collectively define a community based on its purposes for the group members. Lave and Wagner (1991) termed this a community of practice (CoP). Social interaction and collaboration are essential elements of a CoP but these are very flexible and fluid. There are no strict codes of how one is to act within a CoP but there is the assumption that established connections and trust are the foundation of the community. From a

distance learning perspective, the establishment of community can be encouraged or hindered depending on the type of CMC system being used.

Computer-Mediated Communication Capabilities

The principal use of home computers today is for online social interactions (McKenna, Green, & Gleason, 2002), email, and gaming (Beauvisage, 2009). Computer mediated-communication systems are varied and adaptable, synchronous or asynchronous, text- or video-based, highly interactive, and multidirectional. Social networking sites such as Facebook® and MySpace™ are asynchronous multidirectional programs with synchronous capabilities of text-based communication (Gunawardena et al., 2009). Skype™ is a synchronous video chat program allowing group videoconferencing. With the different computer mediums and technologies at the fingertips of every distance education graduate student, connections with others in the same educational program is possible.

The existence of community, and the related construct of social presence, as noted in the literature, may differ depending on the computer medium and how closely the medium mimics face-to-face interactions (Boulos, Taylor, & Breton, 2005; Childress & Braswell, 2006; Rockinson-Szapkiw, 2009; Sanders et al., 2007). For universities offering distance education, this relationship between social presence and CMC systems' ability to impact feelings of loneliness and sense of connectedness may have far reaching implications for influencing the current model of educational delivery.

Geographic distance is no longer a concern for dissemination of learning because of the online platform, and the removal of that barrier is actually beneficial in allowing universities greater outreach (Boshier, Brand, Dabiri, Fujitsuka, & Tsai, 2001). But, geographic distance can be the greatest hindrance to connecting fellow distance graduate

students (Beaumont, Stirling, & Percy, 2009). Yet, the computer has been used to connect people from all over the world. Thus, there is a need to explore how communication tools use social presence to facilitate connection and reduce isolation when student are at a distance.

Asynchronous CMC. Asynchronous text-based CMC systems are the predominant choice of universities when offering online programming (Rovai, Wighting, & Lucking, 2004). This type of CMC for attaining learning outcomes has been well researched and found to be effective (Allen & Seaman, 2003; Shackar & Newmann, 2003). Asynchronous text-based CMC systems to promote online students' social interaction via computer mediums has also been researched and found to be effective (Amichai-Hamburger, Wainapel, & Fox, 2002; Kiesler, Siegel, & McGuire, 1984; Kreijns, Kirschner, & Jochems, 2003; McKenna et al., 2002; Sheeks & Birchmeier, 2007). Sheeks and Birchmeier (2007) found that shy individuals developed good social relationships using asynchronous, text-based CMC.

Relationship building and the subsequent development of community have also been found to develop using asynchronous, text-based CMC systems (Ouzts, 2006; Rovai, 2005), albeit at lower levels in sense of community and social presence when compared to hybrid classes (those incorporating both face-to-face and online) and face-to-face classes (Gunawardena & Zittle, 1997; Rovai & Jordan, 2004). However, studies examining online relationship development have primarily focused on the use of asynchronous text-based CMC, ignoring the synchronous text- or video-based option available through Web 2.0 technology.

Synchronous CMC and learning. Preliminary findings in the research on synchronous, text-based CMC online learning programs are positive (Olaniran, 2006).

However, when searching the literature for quantitative, experimental designs using synchronous text-based CMC systems and their use in instruction, results have been restricted to qualitative evaluation (Johnson, 2006). One study by Lobel, Naubauer, and Swedburg (2002) found students using a synchronous text-based environment were more apt to have deeper discussions, and the authors speculated that the environment circumvented social cues and provided less risk in social disclosure (Lobel, Naubauer, & Swedburg, 2002). These results suggest that with deep discussion and more self-disclosure, members were developing a sense of a learning community through synchronous text-based interactions (Rovai, Wighting, & Lucking, 2004).

Synchronous CMC and community. Results have been mixed as to whether synchronous text-based CMC can effectively support socialization. Although researchers have demonstrated that relationships in synchronous text-based CMC can develop quickly and these relationships were found to be more intimate (Anderson & Emmers-Sommer, 2006; McKenna et al., 2002; Pena, Walther, & Hancock, 2007), others have found the opposite to be true (Hu, 2009; Ramirez, Zhang, McGrew & Lin, 2007).

The limited success found in the use of synchronous text-based CMC for developing social interactions and impacting loneliness has spawned investigations into the effective use of different types of synchronous CMC systems. Technology has developed such that synchronous CMC systems can now be transmitted through video-based means. Synchronous video-based CMC systems have not been researched at all when it comes to the development of the sense of community (Johnson, 2006). Thus, there is a gap in the literature when it comes to research related to social interactions through different synchronous CMC systems and the important meaningful variables,

which assist distance education graduate students to succeed in this type of educational platform.

Community of Practice Framework

Determining the best theoretical framework for understanding Internet socialization is a daunting task. Current social learning theories are not sufficient to address the intricacies of socialization at a distance (Simpson, 2008). With the Internet in its infancy and theories evolving to truly encompass how learning ensues in this medium, taking what is known and co-constructing meaning that adheres to logic fits best at this time with the theoretical framework known as the CoP (Gunawardena et al., 2009).

The CoP postulates a theory of learning incorporating the components of meaning, identity, practice, and community (Wenger, 1998). Meaning relates to how individuals within the community exercise "learning as experience" (p. 5). While practice relates to "learning as doing" (p. 5), identity sheds light on the way people view "learning as becoming" (p. 5). Lastly, community is "learning as belonging" (p. 5). Although these components are intimately intertwined, the community component best reflects the focus of this research inquiry. Not only do individuals within a community desire to socialize and actively participate with others for enhancing learning, there is a deep desire to belong, or feel connected to others in their learning community (Lave & Wenger, 1991). Without this connection, isolation and loneliness may be experienced (Rovai, 2002b).

Problem Statement

This quantitative study addressed the social needs of the average distance education graduate population, which is considered nontraditional and made up of students who are full-time professionals with families and are working to either advance

their career or to transition into a new field of work (McDowell, 2005; Sher, 2004). Although these students are busy professionals, many need social interactions with classmates to facilitate their learning. Unfortunately, social interactions with other students in graduate distance education program are often limited to asynchronous, text-based discussion board posts within the course.

Research shows relationships are very important in helping students achieve and feel satisfied with their schooling (Hara, Bonk, & Angeli, 2000). Group work and collaborative opportunities expand students' assimilation and accommodation of new information (Garrison, Anderson, & Archer, 2001; Graham & Scarborough, 1999; Hiltz et al., 2000; Rovai, 2002b). Kreijns, Kirschner and Jochems (2003) reported students' need for social interactions are often taken for granted or ignored. When social interactions are not considered important and are not carefully tailored into the distance education programming, students may feel isolated and lack a sense of connectedness; thus, resulting in attrition.

Social interactions through different asynchronous and synchronous CMC systems have resulted in numerous studies (Amichai-Hamburger, Wainapel, & Fox, 2002; Kiesler, Siegel & McGuire, 1984; Kreijns et al., 2003; McKenna, Green, & Gleason, 2002). Results have been mixed as to whether synchronous text- or video-based CMC systems can effectively support quality social interactions and the development of community (Johnson, 2006). Thus, this study endeavored to determine the effect different computer mediums (text- and video-based) have on loneliness and a sense of community in distance education graduate students.

Purpose Statement

Best practices in online course design often cite the use of Bloom's Taxonomy to promote coherent course design and effective instructional strategies (Institute for Higher Education Policy, 1999). Similarly, training faculty to facilitate online courses focuses on the instructional design and the student-faculty interactions (Clay, 1999). But little has been done to focus on student-student non-educational interactions. This results in a lack of stimulation of, and opportunity for social relationships to develop at a distance (Szucs-Werner, 2010). Yet, these types of forums for interaction are needed because social relationships are important (Hill, Song, & West, 2009; Hughes, Ventura, & Dando, 2007; Kreijns et al., 2003). Social interactions are integral to the establishment of community in an online setting because interactive communities of learners push one another into higher levels of educational inquiry (Garrison and Cleveland-Innes, 2005; Lave & Wagner, 1991) and social interaction is important to reduce feelings of loneliness.

Social relationship and community development within an online environment require some level of social presence, which is the level of salience of others in a mediated environment (Garrison & Anderson, 2003). According to Garrison, Anderson, and Archer (2010), social presence is a "one dimensional construction associated with an emotional sense of connectedness" (p. 7). Formerly, the creation of social presence in an online environment was thought to be almost impossible. However, as CMC systems have advanced, it has become possible to create increasing levels of social presence; however, little research has focused on the sociability of social software (Gao et al., 2010).

Questions remain unanswered in the current research as to the most effective and efficient computer mediums to develop a strong sense of community with others at a distance while subsequently impacting feelings of loneliness. Therefore, the purpose of this quantitative study was to use an experimental, control group, posttest only design to determine the effectiveness of different computer mediums (text- or video-based) to develop a sense of community and impact feelings of loneliness for distance education graduate students.

Significance of the Study

This quantitative study was designed to investigate how to best meet the relational needs of distance education graduate students by assessing the level of social loneliness and sense of community within this population following the opportunity to interact with other distance education students through different synchronous CMC systems. Kreijns et al. (2003) succinctly characterized Web-based learning environments (WBLE) as singularly focused and purely functional in regard to cognitive learning. Since humans are not "solitary information processors" (p. 349), but rather people looking for affirmation, affiliation, and encouragement while engaging in those cognitive learning activities, the attention to social relationships is paramount to development of community. Web-based learning environments need not only address cognitive learning but also sociability of the environment.

The benefits of determining the most effective computer medium by which interactions between students occur and those that affect the students' sense of loneliness or community may be far reaching for the students, faculty, and university. If loneliness can be diminished and a sense of community attained at a distance by interacting with other students via social networking text-based chat or video-based CMC, this may be the

answer universities have been seeking to address retention and attrition issues. Students may be more connected to the university and have a greater sense of affiliation and affirmation toward their university and a subsequent byproduct may be impetus to persist to graduation, which benefits the university and the student by translating into a myriad of cost savings for all involved.

Research Questions

The research questions for this study are:

(a) Does the type of computer medium used to facilitate online graduate students' peer interactions affect the students' feelings of loneliness?

(b) Does the type of computer medium used to facilitate online graduate students' peer interactions affect the students' sense of community?

(c) What was useful about participating in peer facilitated interactions with other distance education graduate students?

Research Hypotheses

The following are the research hypotheses with their alternative null hypotheses:

H1: Distance education graduate students who interact with other students utilizing different computer mediums (Facebook® chat or Skype^{TM}) will demonstrate a statistically significant difference in their feelings of loneliness as measured by the de Jong Gierveld Loneliness Scale (de Jong Gierveld & Van Tilburg, 2006).

H_O1: Distance education graduate students who interact with others students utilizing different computer mediums (Facebook® chat or Skype^{TM}) will not demonstrate a statistically significant difference in measured feelings of loneliness as measured by the de Jong Gierveld Loneliness Scale (de Jong Gierveld & Van Tilburg, 2006).

H2: Distance education graduate students who interact with other students utilizing different computer mediums (Facebook® chat or Skype^TM) will demonstrate a statistically significant difference in sense of community as measured by the Classroom Community Scale (Rovai, 2002).

H$_O$2: Distance education graduate students who interact with other students utilizing different computer mediums (Facebook® chat or Skype^TM) will not demonstrate a statistically significant difference in sense of community as measured by the Classroom Community Scale (Rovai, 2002b).

Identification of Variables

The independent variables identified for this study included two different technology mediums used for social interactions. The independent variable was defined as type of computer mediums (Facebook® chat or Skype^TM). These Web-based programs are classified as social networking sites.

Facebook® is defined as an asynchronous Web-based platform for social networking. However, the uniqueness of this platform is that it can support *real-time* interactions (Gunawardena et al., 2009), or what is referred to as synchronous capabilities, through its text-based chat feature. Individuals had to be members of Facebook®, but individuals did not have to allow access to personal profiles of those involved in the Facebook® chat group. Skype^TM is a synchronous, video chat platform for social networking allowing up to 10 people to simultaneously, videoconference in real-time. Individuals not only see one another's faces through personal webcams, but they also have access to profile information provided by all group members.

For purposes of this study, an online nontraditional distance education graduate student was defined as one who is actively enrolled in the online graduate program at the

university and is working toward a graduate degree. A graduate student facilitator was defined as a student enrolled in the dissertation completion course. This requirement ensured that student facilitators were not new students without significant experience in the online format.

The dependent variables studied were students' feeling of loneliness and sense of community. Feeling of loneliness was measured using the short version of the de Jong Gierveld Loneliness Scale (de Jong Gierveld & Van Tilburg, 2006). The Classroom Community Scale measured sense of community (Rovai, 2002b).

Assumptions

Humans are social beings and desire social interactions at all levels of development (Carstensen, 1992; Erikson, 1968). Learning occurs outside of formal classroom settings and can be influenced by social interactions (Vygotsky, 1978). Students involved in distance education are assumed to be technological savvy enough to manage the synchronous computer mediums in this study. Additionally, distance education students were assumed to be enrolled in the program with the motivation to maintain enrollment in their program to completion. Finally, attrition occurs for different reasons for distance education students than for those students enrolled in face-to-face programs.

Summary

Through the normal development of play throughout childhood, positive social interactions transpire and learning occurs (Vygotsky, 1976). Social interaction is important to learning beyond recess on the playground. To support interaction and collaboration, classroom-learning groups use multi-person tables and workspaces with a central discussion area separate from smaller perimeter workstations (HMFH Architects,

1998). Outside the classroom, university libraries have study rooms for group interface, along with student centers for social gatherings related to educational and non-educational interactions (Brandes, 2006).

Research has found traditional graduate students self-reported a need for community and connection with others, a desire for interdisciplinary interactions, and specifically, socialization (Brandes, 2006). And, as these traditional graduate students progressed further along in their doctoral studies, they reported more intense feelings of loneliness. Yet, Lovitts (2001) found as graduate students progress, social integration becomes more vital to retention and degree completion. The results from Lovitts' study clearly supported the intuition "the more integrated students became, the more likely the student was to complete" (p. 100). Nontraditional students are often defined as the antithesis of traditional students, who are described as residential, full-time, undergraduate students involved in their studies upon high school graduation (Holley & Taylor, 2009). With this social need so crucial to the traditional graduate student, it may be even more critical to offer social interactions and socializing opportunities to the nontraditional student who is studying at a distance.

To meet academic learning objectives, universities and faculty have capitalized on the Internet and the many unique communication properties of CMC, such as synchronous and asynchronous abilities (Gao et al., 2010) and interactive multimedia, to provide new educational opportunities for distance education students. Delivering high quality, media rich educational material continues to be a main thrust in the education literature (Hao-Chang, 2009; Sherblom, 2010), but little attention has been paid to focusing attention to social learning objectives of a course, such as building social communities at a distance outside of the typical introductions required on the discussion

forums found in the educational delivery platform. Yet, because research indicates social interactions are integral to academic success (Lovitts, 2001; Moore & Kearsley, 1996), universities are faced with the challenge of meeting both nontraditional students' learning and social needs at a distance.

A learning community is a type of community in which members share emotions, values, beliefs, and expectations, and are actively engaged in learning from one another (Palloff & Pratt, 1999). Imbedded within a community of learners is a social community (Lawthom, 2011), or a community of practice (Lave & Wenger, 1991). As occurs in face-to-face classrooms, interactions within a community are not always educationally relevant. In the online education platform, most interactions are academic content-focused and lack opportunity for socialization and community building. However, the advancement of CMC has shown promise in providing platforms for development and engagement of communities at a distance (Hill, 2002).

Different computer mediums are at the fingertips of all distance education graduate students such as Facebook®, MySpace™, Skype™, and SecondLife®. These programs are asynchronous programs with synchronous capabilities of text-based communication. Different levels of social presence are evidenced in these CMC systems (Reynolds & Brannick, 2009; Rockinson-Szapkiw, 2009).

The CoP theoretical framework best encompasses the foundation upon which to build the understanding behind the need for community development in the online format. Not only do individuals within a community desire to socialize and actively participate with others for enhancing learning, there is a deep desire to belong, or feel connected to others in their learning community (Lave & Wenger, 1991). Without this connection, isolation and loneliness may be experienced (Rovai, 2002b).

Because results have been mixed as to whether synchronous CMC can effectively support quality social interactions and the development of community (Amichai-Hamburger, Wainapel, & Fox, 2002: Kiesler, Siegel & McGuire, 1984; Kreijns et al., 2003; McKenna, Green, & Gleason, 2002) the purpose of this experiment (posttest only, control group design) is to determine the effects different computer mediums (text- or video-based) have on loneliness and sense of community in distance education graduate students. If loneliness can be diminished and a sense of community attained at a distance by interacting with other students via social networking or video conferencing, this may be the answer universities have been seeking to address retention and attrition issues. The next chapter outlines the review of the literature related to the challenges distance education graduate students experience, the computer mediums' abilities to support community development at a distance, and a more in depth characterization of how the CoP framework supports the notion that social relationships can impact belongingness, connectedness, loneliness, and community.

CHAPTER TWO: LITERATURE REVIEW

The purpose of this quantitative study was to use an experimental, control group, posttest only design to determine the most effective computer medium (text-based or video-based) used by distance education graduate students in educational and social related interactions, in order to develop a sense of community and to impact feelings of loneliness. The review of literature has three components. The first component addresses the research on distance education and the challenges of distance education on students' retention, sense of community, and feelings of loneliness. The second component reviews the literature focusing on computer mediums and their ability to facilitate sociability. The third component presents social learning theory as the basis for the Community of Practice (CoP) theoretical framework. The CoP framework will demonstrate the importance of social interactions in a learning community and the impact social relationships have on feelings of loneliness and sense of community.

Distance Education

Distance education is defined as education in which there is a geographical gap and a time delay between student and professorial interactions with some form of physical tool as the mediator between the two (American Association of University Professors, 1998; Bejerano, 2008). Distance education began in the 1700s with correspondence schools, in which materials were sent via a mail system to students studying at a distance. This form of distance education was largely unchanged until a new tool was discovered through technological research – audio-visual capability of media (Saettler, 1968).

Thomas Edison predicted in 1913, following the technological invention of film and audio-visual media, the education system would be transformed within a decade

(Saettler, 1968). Instructional media, a new way to teach concepts, was introduced in the form of film, radio, and television. World War II, according to Watkins (1991), slowed the use of this new technology, but at the same time WWII enlightened the military and educational leaders to its need. Using instructional media to train troops in the military was demonstrated as a potential benefit and this knowledge sparked research into the effectiveness of incorporating audio-visual instructional media into the regular education classroom. Although Edison's timing of his prediction was off by a few decades, technology thrust distance education into the forefront of educational development in the last decade. Online learning has proliferated into a new pedagogy.

Today, there are a plethora of terms used to describe online learning. The literature is replete with words such as *e-learning* (Groen, Tworek, & Soos-Gonczol, 2008)*, online education* (Owens, Hardcastle, & Richardson, 2009)*, blended learning* (Schuhmann & Skopek, 2009)*, distance education* (Boyle, Kwon, Ross & Simpson, 2010)*, distance learning* (Simpson, 2008)*,* and *online learning* (Garrison & Cleveland-Innes, 2005; Park & Choi, 2009). Each of these terms, and others, were used when conducting a literature review search to obtain a broader view of this type of educational delivery. For the purpose of this study, the term *distance education* will be used as the catchall name to encompass all forms of online learning and is defined as the use of technology to educate students who are geographically separated from the professor and the university.

Distance education is the fastest growing form of education in the United States with more than 3.5 million students engaged in this type of learning during the 2006 school year (Allen & Seaman, 2007). Growth is expected to exceed 12% in the coming years. Many universities that are solely online offer opportunities to achieve graduate

educational goals not previously possible. Traditional universities, in their desire to meet the educational needs of their students, as well as to expand their reach to many students outside their geographical borders, are teaching students with the use of online technology.

Believing distance education to be the answer to their educational needs, graduate students log in and sign up (University of Denver, 2009). Many graduate students learn immediately how distance education requires a redefining of epistemology and pedagogy (Hartley et al., 2001; Hill, 2002) as well as creates more demand on their time than expected (Nichols, 2010), and have found the experience to be socially isolating (Gunawardena, 1995; Kreijins et al., 2003; Nichols, 2010). Not only do students have personal challenges to face, universities also have programmatic challenges to address.

These programmatic challenges include determining the best delivery format (Hilton et al., 2010) and addressing student dissatisfaction with distance education (Jiang, 2008). As Jiang reports, students often cite a lack of belonging and feelings of social loneliness as key factors in their dissatisfaction (Garrison & Cleveland-Innes, 2005; Hill, Song, & West, 2009; Rovai, 2002a). This dissatisfaction may result in retention issues for the university (Farquharson, 2007; Nichols, 2010; Park & Choi, 2009).

Challenges of Distance Education

Delivery format. Delivering education at a distance can be accomplished in different ways, and researchers have determined the best and most user-friendly delivery format for distance education (Hilton et al., 2010; Zhao et al., 2009). Hybrid, or blended, courses incorporate both face-to-face time as well as online delivery throughout the semester (Baker, 2010). The percentage of time required in class can vary from 20% to 80% (Allen & Seaman, 2006). Although the delivery of blended programming appears to

be the best at capitalizing on the social feature of learning while making good use of the online learning space (Garrison & Vaughan, 2008; Riel & Sparks, 2009), not everyone is geographically able to satisfy this requirement. Thus, many graduate distance education students choose programs completely at a distance (Berjerano, 2008; Groen, Tworek, Soos-Gonczol, 2008).

Ultimately, the main focus of any distance education delivery format is to provide a robust learning environment, orchestrate a functional learning community, and capitalize on the critical aspect of collaboration via technology (Berieter, 2002; Bereiter & Scadamalia, 1993; Garrison & Vaughan, 2008; Palloff & Pratt, 2005; Polin, 2003) and reduce attrition (Nichols, 2010; Park & Choi, 2009). Confronting the students' critical thinking skills and increasing collaboration, as well as providing meaningful interaction should be the goals of any delivery format, rather than simply technologically challenging them (Groen, Tworek, Soos-Gonczol, 2008).

Attrition. Retention has long been of great concern to universities. In the 1970s, a theoretical framework for reducing attrition in the traditional setting was developed (Astin, 1984). This framework contended that students were more apt to persevere to graduation if they were involved in their institution. True involvement required the student to be invested in the university, put great energy toward their academic relationships, and be involved in activities related to the campus (Astin, 1984). Astin found peer groups significantly impacted the psychological, cognitive, and affective development of individual students. Follow-up research by Astin (1993) specifically found retention was related positively to three important relationships – academic, faculty, and peer groups.

Although Astin's (1984) research was focused on face-to-face delivery of education, Nichols (2010) reported similar results in a qualitative study of retention in distance education courses. The most important contributor to persistence to completion was contact with the course instructor. Nichols (2010) also found students attributed their increased persistence to interactions with other students in the course and students often commented that personal emails from support staff who "understand what my situation is" (Nichols, 2010, p.105) were especially encouraging. Nichols' (2010) simplified conclusion was that distance education students do not drop out as frequently when they have interactions with others (students and educators), and when they feel like their unique experiences of learning at a distance are understood. Another interpretation is distance education students desire involvement, or connection, with other students and if they achieve this connection, it may serve as an incentive to keep them persevering toward graduation.

Tinto (1975) developed a student retention model to better understand dropout issues in higher education. Its central theme is assimilation such that student persistence is strongly predicted by the degree of social integration into the university and peer group relationships. Specific to the general population of distance education students, Kember (1989) researched and created a retention model to understand the causes of students' lack of persistence to graduation. The model was tested successfully in different settings under different circumstances and lends support for the emphasis of the need for social integration for student progress in distance education (Kember, Lai, Murphy, Siaw, & Yuen, 1992, 1994).

Paying particular attention to nontraditional distance education students, Rovai (2003) proposed a persistence model to explain dropping out of distance education by

this population. Rovai identified characteristics such as social integration, interpersonal relationships, and outside influences as integral to persistence. The results of research to support this model have been confirmatory (Park & Choi, 2009).

As previously noted, dropout rates among graduate distance education programs are significantly higher than dropout rates for students in traditional face-to-face settings (Bernard & Amundsen, 1989; Carr, 2000; Lovitts, 2001). These attrition statistics are alarming since universities all over the world are working to expand their distance education programming to compete in the global marketplace (Manzanareas, 2004; Rybarczyk, 2007). A number of strategies for reducing attrition of nontraditional distance education graduate students are being explored in the research, and the targeted interventions include more support (Tait, 2004), student-student mentoring (Boyle et al., 2010), more personalized attention (Simpson, 2004), pre-counseling (Bird & Morgan, 2003) and attention to both academic and non-academic needs of the students (Nichols, 2010; Simpson, 2004).

The unique social and emotional need for connectedness in this population is gaining in importance, but more work needs to be done to connect student to student (Boyle et al., 2010). Although distance education can be engaging and interactive, logically it can be considered more isolating than face-to-face programming for the nontraditional distance education graduate student (Rovai, 2002c). Social loneliness and lack of connectedness have been reported frequently as obstacles to perseverance in distance education programming (Hill, 1997; Rovai, 2002a).

Social loneliness and connectedness. In a qualitative study completed by Owens, Hardcastle, and Richardson (2009), distance education students were asked what would have made their distance education experience better. Many reported they would

have liked to counteract the loneliness with synchronous opportunities with peers and instructors. They reiterated the importance of needing to feel as though they belonged to the university community.

Connectedness to a people group is an important part of growing, learning, and maturing (Slagert van Tryon & Bishop, 2006) and is an integral part of community (Rovai, 2002b). Through extensive literature review, this need for involvement has been identified under constructs such as *belonging, association*, *connectedness*, and *community*. For purposes of this study, this need for belonging, association, or involvement is described through the use of the terms connectedness and community. These two constructs, connectedness and community, are slightly different, but they can be interchangeable due to their intimate relationship (Lee & Robbins, 1995).

Brown, Collins, and Duguid (1989), along with Lave and Wagner (1991) argued that a learning community promoting ongoing social interactions leads to positive collaboration. According to Brown et al. (1989), "Learners gain a sense of belonging through interpersonal interactions and collaborative meaning-making" (p. 50). In face-to-face settings, students immediately assess others within the group, identify their own personal standing within the group, and develop a hierarchy within the classroom setting. Once established, this can reduce stress and confusion in the learning process (Hsu & Bruce, 1998). However, in distance education, it is more difficult to establish a sense of belonging and this lack of connectedness can lead to social loneliness and lack of community (Slagert van Tryon & Bishop, 2006).

Community. Researchers (Andrade, 2008; Buch & Spaulding, 2008; Rovai, Wighting, & Lucking, 2004) asserted that a sense of community has two dimensions: learning community and social community. The learning community is the

connectedness students feel toward others to the degree they share like educational goals and expectations within the coursework. There is a similar sharing of group values and norms. Several researchers (Glynn, 1981; Gunawardena, 2009; Wenger, 2002) have argued that the critical aspects of group cohesion are the values and norms of the community.

Related to the learning community is the social community, but here members focus on the connectedness they feel in terms of safety, trust, interdependence, and sense of belonging (McMillan & Chavis, 1986; Wenger 2002). The social community appears to be more of an emotional response to the connectedness felt from having like values with those in the learning community. These communities evolve at a distance to the degree the computer technology can enable members to dialogue and convey shared values and accurately express felt emotions (Guan, Tregonning, & Keenan, 2008; Reynolds & Brannick, 2009).

Because of the uniqueness of distance education, computer technology and its capabilities are a necessary part of the development of both the learning and the social communities. In early media theory and research about technology, it has been found media will "only make a significant contribution to learning ... if their application is designed into complex social and cultural environments of learning" (Kozma, 1994, p. 17). Since distance education by definition requires computer technology as its mediator, the application of media in the development of community must be designed carefully into the distance education program.

The challenges within the university setting to address student success issues are predicated on the physical tools in which they function (Hill, 2002). Distance education depends on the Internet's capabilities for communicating more than simply information

from a teacher-student perspective (Farquharson, 2007; McPherson & Nunes, 2004). The distance education platform requires an interactive quality for curriculum delivery, communication, and sociability (Kozma, 1994). The current study focused on computer mediums that can develop social communities to reduce loneliness among distance education students.

Computer Mediated Communication

Computer-mediated communication (CMC) has a myriad of definitions, but it can be as simple as being concerned "specifically with human interpersonal communication on, through, and about the Internet and Web" (Thrulow, Lengel, & Tomic, 2004, p. 16)**.** As the Internet, or Web, has advanced from a virtual encyclopedia of information, which allowed users to retrieve data, referred to as Web 1.0, to a Web-as-participation-platform, referred to as Web 2.0, the computer has fundamentally shifted the way in which people are communicating with others (Gunawardena et al., 2009). Web 2.0 is an "enabling technology" (Bernal, 2010, para 4) - enabling the user to interact with others through a variety of mediums. Web 2.0 technology enables content sharing and collaboration (Gunawardena et al.; Rockinson-Szapkiw & Walker, 2009), and social networking is one form of this technology (Gao, Dai, Fan, & Kang, 2010). Gao et al. (2010) claimed boldly that the Internet has become the central means of social life for many.

Sociability of CMC. The precursor to good social interactions, online or face-to-face, is an environment communicating accurate social cues and information (Kreijns, Kirschner, Jochems, & Buuren, 2007). According to Kreijns et al. (2007), the users within an online environment must be able to successfully perceive many different messages and identify qualities of the messenger within the social space, or what is more aptly termed the "sociability" of the environment. In typical face-to-face interactions,

members of a group have the benefit of visual cues, knowledge of physical proximity, and general group awareness. These are called social affordances and they are at play in an online environment in accordance to the increasing measure of sociability of the CMC system (Kreijns et al., 2007).

Sociability is defined specifically as the "extent that a computer-supported communication environment supports online social interaction" (Gao, Dai, Fan, & Kang, 2010, p. 1846). Daft and Lengel (1984) developed a theory of media richness of CMC. The capability of the CMC to send information, which is less ambiguous, promotes understanding, and takes less time to convey, is considered the richest form of communication (Deft & Lengel) and could be considered the most sociable (Gao et al., 2010) despite evidence that some CMC systems are informal and low in intimacy (Hiltz, Johnson, & Turoff, 1986; Walther, Anderson, & Park, 1994). In contrast, others found the more intimate, or less anonymous the social interactions, the more connectedness users will feel toward others within the community (Cutler, 1996; Kock, 2005). The argument contending the more sociable a computer medium, the more likely it is to produce, develop, and maintain relationships between users (Guan et al., 2008), needs further exploration. If the sociability of computer mediums could create more intimate, less anonymous interactions, this may translate into connectedness for the users.

Asynchronous versus synchronous interactions. The use of CMC can allow individuals to experience reciprocal interactions through a variety of mediums (Reynolds & Brannick, 2009). These interactions can be synchronous or asynchronous depending on the platform being used (Boulos, Taylor & Breton, 2005; Rockinson-Szapkiw & Walker, 2009). Interactions can be text-based, voice, video, and 3-D virtual worlds, which can combine text, voice, and personally designed avatars (Williams et al., 2007).

To date, much of the research on CMC is focused on the asynchronous aspect of communication such as email, bulletin boards, and discussion forums (Garrison & Cleveland-Innes, 2005; Hill, 2002; Kreijns et al., 2003; McPherson & Nunes, 2004; Nichols, 2010; Rovai, Baker, & Cox, 2008). The research shows asynchronous learning networks (ALN) are the format of choice for most universities and include course management systems like WebCT, Blackboard, and Moodle (Groen et al., 2008). These ALNs support self-study with opportunities for asynchronous student interactions through discussion boards found in the platform (Bhowmick, Khasawneh, Bowling, Gramopadhye, & Melloy, 2007).

The exchanges within the discussion forums and other threads are designed to support maximum learning through negotiation and knowledge construction by participant students, to increase a shared sense of purpose through group work, and to enfranchise all members equally because of the temporal aspect of distance education allowing digestion and formulation of a coherent response (Hopperton, 1998; Markel, 2001; Shea, Pickett, & Pelz, 2003). However, the establishment of a learning community has not been easily supported in this asynchronous environment as compared to face-to-face environments (Moore, 1993; Moore & Kearsley, 2005; Rovai, 2002a), which can hinder learning (Rovai, 2002; Stodel, Thompson, & MacDonald, 2006; Vaughan & Garrison, 2006).

Synchronous text-based CMC learning research has shown promise in mimicking the academic results found in face-to-face environments (de Freitas & Neumann, 2009; Locatis et al., 2010; Xenos, Avouris, Stavrinoudis, & Margaritis, 2009). Few studies have been done to assess the impact of this type of synchronous environment has on the establishment of community. One of the few was conducted by Xenos et al. (2009) who

found in their study on synchronous text-based peer collaboration activities that students reported a positive social impact which "contributed towards the development and strengthening of the virtual student community" (p. 310). Comparatively, a case study by Boulos, Taylor, and Breton (2005), reported the positive impacts that synchronous, voice-only CMC had on students' sense of belonging and educational outcomes, but also concluded there was a need for more robust research with rigorous procedures to convince educators of the benefits of any type of synchronous CMC. These studies are a start in contributing to a knowledge base about different synchronous communication programs and their benefits, but it is evident there is a gap in the literature related to how different forms of synchronous communication could assist in the establishment of community through social interaction and relationship.

Asynchronous CMC and instruction. Researchers have concluded that some CMC technologies are meeting the standard as a mode for educational delivery for distance education as noted in the findings of studies addressing the quality of instruction. The results suggest that student academic discussions using asynchronous text-based CMC technologies were as good, if not superior, than face-to-face programs (Johnson, Howell, & Code, 2005; Koory, 2003; Wang, 2004). Additionally, positive student satisfaction and achievement in asynchronous CMC technologies may be related to peer interaction. Johnson et al. (2005) in their study found online students outperformed the non-online students "at least in part, due to peer evaluation and peer interaction which functioned to enhance individual motivation to make [online] postings of the highest quality" (p. 70). Additionally, Rovai's (2002) work has found, in asynchronous text-based environments, perceived learning was related, in part, to a sense of classroom community.

Synchronous CMC and instruction. Early research has suggested that some synchronous CMC technologies, like voice or video, may be inferior to asynchronous online communications (Berge, 1999; McDonald, 2002) because individuals within an asynchronous text-based environment can feel unencumbered by social cues such as gender, appearance, and race by providing a sense of anonymity to interactions. However, it then lacks in social cues (e.g., tone, inflection), which are helpful to increased understanding and other social-emotional communication. It was noted by Johnson (2006) that the effectiveness of and synchronous CMC interactions has not been well researched. However, the few published studies are showing promise that the use of synchronous text-based CMC technology could actually reduce feelings of loneliness and increase sense of community (Gunawardena & McIssac, 2004; Hrastinski, 2008).

Interestingly, in a qualitative study assessing doctoral students' perceptions of the quality of asynchronous text-based CMC use in online classrooms, the participants expressed the desire to occasionally engage in interactions with other students in some form of synchronous activity (Grooms, 2003). These results were consistent with findings from Boulos et al. (2005) who found students desired a 95/5 (asynchronous to synchronous) percentage delivery approach. The respondents in the Grooms (2003) study offered ideas like town hall meetings with a synchronous open forum or an electronic bulletin board for posting personal information, which were interpreted by the author as a need for connectedness with other students. Based on Grooms' study, the findings suggest distance education students desire to have the more personal types of interactions with other students closely mimicking face-to-face interactions, which would be more specifically referred to as synchronous voice- or video-based interactions to enhance connectedness, or specifically, a sense of community.

Since the advent of new, more advanced synchronous CMC technologies like

video-based interactions and e-conferencing, it is even more imperative a research topic.

As mentioned previously, the literature has consistently cited the development of a sense

of community as a potential mediating variable in retention studies (Carr, 2000; Drouin &

Vartanian, 2010; Rovai & Wighting, 2005), which could be the most important reason to

add to the body of literature in this research area.

Modes of communication. Although CMC is a complex science, there are some

basic attributes of communication assisting in the flow and continuity of conversation,

which can impact the sociability of a medium (Reynolds & Brannick, 2009).

Conversational continuity can impact the communication, and when interrupted, can even

damage the message (Shankar, VanKleek, Vincenti, & Smith, 2000). Table 1 classifies

the dimensions of communication to help facilitate understanding of the constructs to be

discussed.

Table 1

Communication Modes and Dimensions

Dimension	Communication Mode			
	Face-to-Face	Video	Telephone	Text
Co-Temporality	X	X	X	X
Simultaneity	X	X	X	X
Sequentiality	X	X	X	
Audibility	X	X	X	
Visibility	X	X		
Co-Presence	X			

Note: Video = Computer based video teleconferencing; Text = computer-based electronic
chat. Reprinted from *Computers in Human Behavior, 25,* R. Reynolds and M. T.
Brannick, "Effect of communication media on developmental relationships: Self-reported
and observed behaviors," p. 234, 2009, with permission from Elsevier.

Co-temporality, simultaneity, and sequentiality are characteristics of communication that must be considered carefully when addressing the sociability of computer mediums (Reynolds & Brannick, 2009). Each of these characteristics of communication relate to the timing of interactions and whether both parties can interact at the same time (simultaneity), the message is received as soon as it is sent (co-temporality), or the message is sent and received in sequence (sequentiality). Based on the information in Table 1, face-to-face, video conferencing, telephone, and text-chat can all achieve simultaneity and co-temporality. The breakdown occurs at the sequentiality characteristic. Sequencing of communication is important to a clear message and for opportunity to gather additional information about the topic of discussion.

Additional characteristics to consider when addressing sociability of computer mediums are their audibility, visibility and co-presence (Reynolds & Brannick, 2009). These three characteristics are related to the non-verbal cues used in a conversation to assess meaning, regulate emotion, assess intent, provide information, and express intimacy (Derks, Bos, & Grumbkow, 2007; Driskell & Radtke, 2003). Audibility and visibility are found in face-to-face and video conferencing settings. When these characteristics are available, they decrease the psychological distance felt between the communicators, which may lead to increased connectedness. Co-presence is the one variable that can only be truly achieved in the face-to-face setting since it is by definition when participants are physically in the same location (Reynolds & Brannick, 2009). Co-presence has the capacity to increase social closeness or what Short, Williams and Christie (1976) termed, social presence.

Social interactions and social communications are key components to understanding why and how humans learn and interact with each other (Guan et al., 2008;

Kreijns et al., 2003). The social learning theory of development provides the theoretical basis for understanding CMC and social interactions (Bacalarski, 2000). Specifically, the social learning theory, as seen through the CoP framework, is the operationalized explanation for an online community of relatively unknown, but educationally connected, individuals (Gunawardena et al., 2009; Wenger, 1996).

Theoretical Framework

Lev Vygotsky is known for his work in social learning theory development (Bacalarski, 1996). At the heart of learning and human development is sociability (Glassman, 2000). Vygotsky's (1978) premise in his social learning theory is that cognitively challenging higher forms of mental activity originate from cultural and social experience. Vygotsky saw collaboration as a key to the development of higher, advanced mental processing. By engaging in dialogue with individuals with more knowledge, students learn to think and behave in ways that represent their culture. The students internalize the central features of the dialogue and utilize the strategies embedded in the dialogue to assist in accomplishing skills on their own (van der Veer & Valsiner, 1991). This collaboration with a more experienced individual, or a peer, is one aspect of learning (Vygotsky, 1978). These interactions are not limited to human interaction but encompass interactions with what Vygotsky termed cultural artifacts. These cultural artifacts are also known as tools (Bacalarski, 2000).

Vygotsky's tools. According to Vygotsky (1978) there are two very distinct types of tools – psychological tools and physical tools. Physical tools are tools within the industrialized society for everyday use and are mass-produced for the general population (e.g., hammers, computers). There are psychological tools for the express purpose of understanding and utilizing physical tools. To Vygotsky, psychological tools such as

language, symbols, concepts, and beliefs are some of the tools used for the development of knowledge.

Psychological tools and physical tools must work in conjunction with one another for effective learning to occur (Vygotsky, 1978). The Internet, for example, is the culmination of the use of both physical and psychological tools by computer scientists. Vygotsky's conceptualization of tools engages the strengths of both physical and psychological tools used for understanding social learning theory, as it relates to connectedness with others at a distance via the Internet.

Vygotsky's social learning. Vygotsky (1978) believed strongly that social influences impact cognition. Vygotsky alleged that social learning preceded development such that every function in the child's cultural development appears twice: first, on the social level, and later, on the individual level. Because social interaction is a key element of his theory, he included what he termed the *more knowledgeable other* (MKO). The MKO is the individual who has mastered a concept or demonstrates abilities desired by others. This MKO can be a teacher, coach, peer, or even a computer. The interaction between the subject and the MKO facilitates development (Berk & Winsler, 1995). Hence, the social interactions with a MKO are a precursor to quality educational interactions.

There is a connection, for Vygotsky, between people and the community in which they interact. These shared experiences, between MKOs and members of a community, are what lead to cognitive learning. This constructivist thinking endorses participants as active participants in their learning, and utilizing a MKO, participants can achieve more than what they could achieve independently. Together, community members can achieve purposeful and effective collaboration when a sense of connectedness and trust is felt

(Kirkup, 2002; Gibson & Manuel, 2003; Ellis, Oldridge, & Vasconcelos, 2004). Out of this connectedness comes a sense of belonging to a community. As stated previously by Palloff and Pratt (1999), the development of community is a necessity for learning to occur; specifically "the learning community is the vehicle through which learning occurs online" (p. 29). Belongingness is a construct intimately related to community.

Belongingness

Heinz Kohut (1984) proposed a construct of belongingness attempting to address the lack of connectedness in our society. Though Kohut's construct of belongingness was never fully developed, he did provide the groundwork for an understanding of this concept, which began with the thesis that people, in order to avoid feelings of isolation and loneliness, seek confirmation of connectedness with others (Lee & Robbins, 1995). The underlying assumptions are people desire connectedness with others and do so to avoid loneliness.

Lee and Robbins (1995) furthered Kohut's work by proposing the construct of belongingness as being composed of three aspects – companionship, affiliation, and connectedness. These three constructs have been researched and known to predict social satisfaction, reduce loneliness, and increase enjoyment in life (Rook, 1987). Logically, these three constructs are interrelated but they are also progressive components of emotional development from infancy to adulthood (Lee & Robbins, 1995).

Belongingness appears to be a hierarchically derived construct. First, the experience of companionship with nurturing parents who develop healthy bonds with their infant serves as the establishment of a sound base from which trust and security in relationships develops (Lee & Robbins, 1995). In later childhood, affiliation develops when peer relationships emerge and mature. Affiliation with individuals who are like-

minded in opinions, values, and appearance characterize early adolescent relationships.

Finally, connectedness is characterized as much like Maslow's (1908-1970) final

achievement of self-actualization. The constructs of companionship and affiliation are

the building blocks for connectedness, which allow individuals to see themselves as

united to the world around them.

According to this definition of belongingness, being connected to others begins

early and continues to develop through adulthood. As Kohut (1984) began, humans

crave connectedness to avoid feelings of isolation and loneliness. Logically then, the

antithesis of connectedness are feelings of loneliness and isolation. Connectedness is a

key element in the formation of community and within community individuals can

develop and flourish (Garber, 2004; Rovai, 2002a).

Community of Practice

Traditional social learning theories provide a good foundation for understanding

general human interactions but with the advent of Web 2.0 technologies, the way in

which people behave, interact, and acquire knowledge has changed (Gunawardena,

2009). Social learning theorists never had to assume face-to-face interactions were an

option, but with the Internet, they are no longer a required component to social learning

theories. The Internet, which allows interactions that defy time, space, and use of

familiar tools, creates new opportunities for learning and renders our traditional learning

theories (e.g., behavior, cognitive) as inadequate to address the changes it brings about

(Gunawardena, 2009).

New ways to conceptualize learning via the Internet have been proposed by many

researchers (Benbunan-Fich, Hiltz, & Harasim, 2005; Garrison, Anderson, & Archer,

2000; Wenger, McDermott, & Snyder, 2002) but no single theory focuses solely on social

learning at a distance. The models proposed in the literature have social learning as a component, but most are relatively lacking in verification and acceptance at this time (Garrison & Arbaugh, 2007). The attention to the means by which people interact, develop relationships, and establish connectedness remain imbedded in the online learning frameworks incorporating the social learning aspect within the development of community. At this time, the CoP framework appears to be the best approach to understanding social learning because of its focus on community and its deference to time and space challenges (Wenger, 2002).

The CoP framework as defined by Wenger (2002) suggests a community of people "who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis" (p. 4). The CoP is defined by what it is about, how it functions, and what capabilities it produces (Wenger, 1998). The three structural elements to a CoP include: (a) domain, (b) community, and (c) practice. The development of a CoP is not constrained by time and space; thus, social networking technologies and CMC systems are well suited for understanding the community in the online format.

Domain. The domain represents the common ground for members to share ideas, interests, experiences, and wisdom about a topic of interest to the members (Gunawardena et al., 2009). CMC systems are well suited for presenting a forum for interactions among participants. Members of a domain of interest share a commitment to the domain topic. The domain has an identity and members have a competence distinguishing them from nonmembers. According to Lave & Wenger (1991), there is a sense of connectedness between members concomitant with the interactions related to the domain topic (e.g., graduate students studying education online).

Community. According to Wenger et al. (2002), the community is the "social fabric of learning" (p. 28). Membership is much more than a club membership or a compiled network of acquaintances (Wenger, 2006). Interactions within a CoP result in "feelings of belonging and mutual commitment" (Wenger, 1998, p. 28). Within the confines of community the members engage one another and actively learn from each other (Wenger, 2006). The development of community grows from the association with the domain topic (e.g., distance education graduate students studying education and interacting with each other in a course).

Practice. The natural maturation of a CoP is noted in the product produced from the community's interactions in the domain of interest (Gunawardena et al., 2009). Inside formal and informal interactions with community members of the domain of interest, conversations lead to changes in behavior. A repertoire of experiences shared among the members, is social learning in practice.

When these interactions are mediated through social networking technologies or CMC systems, it can expand human capabilities (Vygotsky, 1978). The use of social networking tools together with psychological tools, can change "how we think, how we learn, and how we interact with each other" (Gunawardena et al., 2009, p. 8).   A good example of a CoP might be distance education students studying education, who interact with each other on a regular basis, and work together to challenge each other to better the field of education. The result, or the practice of the CoP, is to work to challenge each other to make a difference within the field and within each member.

Summary

Social learning theory supports the notion humans are social beings in need of connectedness and belonging, and according to Vygotsky (1978), cognition develops

through interactions with others (Rovai, 2002a). Students on campuses experience the social learning within the face-to-face courses found on college campuses (Glomb et al., 2009; Hill, 2002). Distance education students who are separated geographically from their university are less likely to experience social opportunities to enhance learning and thus, have feelings of loneliness (Dickey, 2004; Jiang, 2008) and lack a sense of belonging (Rovai, Baker, & Cox, 2008). These feelings may increase attrition (Hill, 1997; Nichols, 2010; Rovai, 2002a).

Palloff and Pratt (1999) claimed the development of community is a necessity for learning to occur, stating specifically "the learning community is the vehicle through which learning occurs online" (p. 29). The most significant pitfall found in the research related to course design was the assumption that social interaction, or the development of community, did not need special attention in order to emerge (Kreijns et al., 2003; Liaw & Huang, 2000; Moore & Kearsley, 1995; Northrup, 2002; Wenger & Snyder, 2000). McMillan and Chavis (1986) defined community as members feeling, among other things, a sense of belonging and Brown et al. (1989) found learners' social interactions and collaboration are precursors to belonging.

The challenge of distance education is to create an avenue for community development. Computer-mediated communication systems have shown promise in providing opportunities for social interactions. However, many questions remain as to the best mode of communication for the development of quality social interactions impacting feelings of loneliness and connectedness at a distance. By connecting nontraditional distance education graduate students with other graduate students learning at a distance in the same domain of interest, or a community and practice, the results may warrant rethinking education at a distance.

CHAPER THREE: METHODOLOGY

Distance learning has become a mainstay in education and determining the best practices for enhancing the delivery of education such that quality of the pedagogy is as good as face-to-face delivery is of utmost importance. The challenge for universities offering distance education programs is to find the most efficient and effective computer mediums for supporting successfully all aspects of the educational process for students. Since Astin (1977) reported greater involvement in campus activities leads to greater academic success, distance education is at a disadvantage. However, Gardner and Barnes (2007) suggested the definition of involvement could be extended to include any interaction within the campus community or setting.

Social interactions on the Internet are a stronghold of the current culture. Thus, the ability to substitute campus activities with peer interactions from a distance could remove the disadvantage from distance education. The investigation into knowing if there is a difference in a computer medium's ability to create a sense of community and influence feelings of loneliness for the distance education graduate student would give universities an advantage. By carefully integrating distance education students' interactions into the program, the results in greater academic success would be evidenced. And according to Gardner (2007), these interactions are part of the socialization process preparing the student for future professional success. Creating a program, which attempts to meet all the educational, psychological, and social needs of the students, will logically enhance persistence to graduation, increase perceived and true learning (Rovai, 2002a), and produce distinguished alumni.

The current quantitative study focused upon nontraditional distance education graduate students in pursuit of their educational goals. An experimental design (randomized subjects, control group, posttest only) was used (Campbell & Stanley, 1963). Students were randomly assigned to different computer mediums and interacted over an 8-week period. A distance education graduate student at the stage of dissertation completion facilitated these interactions.

After having an opportunity to interact with other distance education graduate students, students were asked to complete a survey incorporating two instruments to assess loneliness and community. Additionally, three open-ended questions were incorporated into the survey. Statistical analyses of the data were performed to assess the difference in the measured constructs between groups. This chapter outlines the methodology of the study and is organized as follows: (a) participants, (b) setting, (c) CMC groupings, (d) instrumentation, (e) procedures, (f) research design and analysis.

Participants and Facilitators

The study was designed to address the unique issues of nontraditional distance education graduate students; therefore, the population identified for this study consisted of nontraditional distance education graduate students enrolled in an accredited, graduate-level online education program leading to an Education Specialist or Doctorate degree in the field of education. The sample for the study was a convenience sample from one university located on the east coast offering an online Education Specialist or Doctorate degree. Data were analyzed from the participants who completed the survey following their participation in the study. The study was carried out over two, 8-week courses, which ran across one 16-week semester. In the first 8-week session, recruitment emails were sent to 349 potential participants. Seventy-three students agreed to participate

during the first 8-week session. Of those who participated, 51 returned the survey. Two

students provided incomplete surveys, which were removed from the data before the data

were analyzed. Forty-nine completed surveys were analyzed. During the second 8-week

session, recruitment emails were sent to 668 students. Fifteen participants agreed to

participate, and 13 of those participants returned completed surveys. Therefore, over the

16-week semester, 88 participants were involved in the study, and 62 completed the

survey at the end of the semester. The participation rate for the survey was 70%.

Participants. All participants were enrolled in graduate level courses leading to a

Specialist or a Doctoral degree in education. The majority of participants were female.

The demographics of the participants are found in Table 2.

Table 2

Demographics of Sample Population

Race

Caucasian	48 (77.4%)
African-American	11 (17.7%)
Hispanic	1 (1.6%)
Other	2 (3.2%)

Age

19 – 28	3 (4.8%)
29 – 38	14 (22.6%)
39 – 48	16 (25.8%)
49 – 58	24 (38.7%)
59 +	5 (8.1%)

Marital Status

      Married   53 (85%)

      Not Married   9 (14.5%)

Number of Children

      0   9 (14.5%)

      1   6 (9.7%)

      2   17 (27.4%)

      3   17 (27.4%)

      4   13 (21.0%)

English as First Language

      Yes   58 (93.5%)

      No   4 (6.5%)

GPA

      4.0   44 (71%)

      3.5   14 (22.6%)

      3.0   3 (4.8%)

Expected Course Grade

      A   53 (85.5%)

      B   7 (11.3%)

      C   1 (1.6%)

Employment Status

      Full-Time   44 (71%)

      Part-Time   14 (22.6%)

      Not Working   4 (6.5%)

Participants were randomly assigned to one of three groups, which included the two computer medium groups (Facebook® chat, Skype™) and the control group. Summary statistics for the subjects' demographic variables disaggregated by computer medium assignment are displayed in Table 3.

Table 3

Descriptive Statistics for Participants' Demographics Disaggregated by Computer Medium Assignment

Demographic	Facebook® chat ($n = 21$)	Skype™ ($n = 20$)	Control ($n = 21$)
Age			
19-28	2 (9.5%)	1 (5.0%)	0
29-38	3 (14.3%)	3 (15.0%)	8 (38.1%)
39-48	5 (23.8%)	7 (35.0%)	4 (19.0%)
49-58	7 (33.3%)	9 (45.0%)	8 (38.1%)
59+	4 (19.0%)	0	1 (4.8%)
Number of Children			
0 children	5 (23.8%)	4 (20.0%)	0
1 child	1 (4.8%)	1 (5.0%)	4 (19.0%)
2 children	4 (19.0%)	5 (25.0%)	8 (38.1%)
3 children	4 (19.0%)	8 (40.0%)	5 (23.8%)
4+ children	7 (33.3%)	2 (10.0%)	4 (19.0%)
GPA			
4.0	16 (76.2%)	15 (75.0%)	13 (61.9%)
3.5	4 (19.0%)	4 (20.0%)	6 (28.6%)

3.0	1 (4.8%)	1 (5.0%)	1 (4.8%)
Expected Grade in Course			
A	16 (76.2%)	19 (95.0%)	18 (85.7%)
B	3 (14.3%)	1 (5.0%)	3 (14.3%)
C	1 (4.8%)	0	0
Employment Status			
Full-Time	15 (71.4%)	13 (65.0%)	16 (76.2%)
Part-Time	5 (23.8%)	5 (5.0%)	4 (19.0%)
Not Working	1 (4.8%)	2 (10.0%)	1 (4.8%)
Race			
Caucasian	13 (61.9%)	19 (95.0%)	16 (76.2%)
African-American	6 (28.6%)	0	5 (23.8%)
Hispanic	1 (4.8%)	0	0
Other	1 (4.8%)	1 (5.0%)	0

Facilitators. Seven students (three men, four women) agreed to facilitate the peer interactions. Facilitators were graduate students completing their dissertation within the department of education at the participating university. During the first 8-week session, there were five facilitated groups (two Facebook® chat; three Skype^{TM}) and one non-treatment, control group with an average of seven participants per group. During the second 8-week session, four facilitators (two Facebook® chat; two Skype^{TM}) were used; three had also served as facilitators during the first session. The groups during the second 8-week session averaged four participants per group.

Recruitment

Institutional Research Board (IRB) approval was obtained prior to the commencement of the research study. Upon receiving IRB approval the recruitment of participants and facilitators began. Recruitment of facilitators and participants took place at the beginning of the Fall 2011 semester terms. Semester terms were each eight weeks in length.

Facilitators' recruitment, assignment, and training. The School of Education Faculty Support Coordinator was contacted to assist in the recruitment of student facilitators. Student facilitators were recruited through convenience sampling from all possible graduate students completing their dissertation within the department of education at the participating university. Six hundred and forty eight possible facilitators were contacted. Three weeks prior to the beginning of the Fall 2011 semester, an electronic letter outlining the requirements of a facilitator (e.g., has basic computer literacy skills, checks in with group weekly, provides open-ended questions to get students interacting, answers basic questions about the program) was forwarded to potential facilitators (see Appendix A). The letter was from the researcher and forwarded to students by the Faculty Support Coordinator to students' university email accounts. Potential facilitators were asked to commit to facilitating a group of up to 10 participants. The facilitator would be provided with conversation starters and technical support as needed. Motivated facilitators were directed to email the researcher with their interest in facilitating a group.

Interested facilitators responded with an email stating their interest in assisting fellow students navigating their way through distance education. A screening instrument

was returned to each potential facilitator to screen for level of technology skill (see

Appendix C). Those returning the email with the completed questionnaire were

contacted again via email and/or a phone call to review the specific skills questioned in

the screening and to ask for their comfort level with the different mediums. Many

interested facilitators were eliminated from involvement in the study for a variety of

reasons including but not limited to: uncomfortable with certain mediums, had conflicts

with meeting times, or personal commitments precluding weekly engagement. Those

chosen to facilitate were matched to the technology medium that best fit their computer

literacy skills (e.g., was a regular user of the specific technology, demonstrated its use in

our screening interactions) and their personal interest based on the screening.

The facilitators interacted with the students via Facebook® chat or Skype[TM].

Facilitators were trained to utilize the technology medium to which they are assigned

through an online tutorial video created for this research project. Facilitators for the

Facebook® chat group used their own personal profiles to interact with the participants,

but also set up a "secret" Facebook® chat group within the medium for group interaction.

A secret group is a setting that allows only those invited members into the group access

to the other members' posts on the group wall. Members are not "friends" with other

members but can see what is posted in the secret group. Skype[TM] facilitators used their

personal Skype[TM] accounts to interact with participants. Facilitators were asked to

commit to interact with the participants through the designated medium on a weekly basis

during the 8-week semester term. Weekly interactions consisted of the facilitator

presenting conversation starters related to educational and social topics to the group (see

Appendix D). All fees necessary for the facilitators' involvement in the study (e.g.,

Skype™ Premium) were covered. Additional support was provided to facilitators as

needed. A series of spot checks were performed during the experimental period (e.g., a chat session copied into a document and reviewed) to assess quality of social interactions and ensure participants were interacting. Remuneration in the form of a $25 gift card was provided to each facilitator.

Participants' recruitment and assignment. Two weeks before the Fall 2011 semester began, those instructors engaged in teaching a graduate-level course for the university's school of education during the Fall 2011 semester term were asked to forward the recruitment letter to the students enrolled in their course.

The general purpose of the study was presented in a recruitment letter. This included information about time commitment and general computer literacy skills needed (see Appendix A). Participants who agreed to participate were instructed to respond to the recruitment letter with an email to the researcher indicating their desire to be included in the study. The informed consent (see Appendix B) was sent via email to the interested students along with a link to a secure website preserving their digital signature if they agreed to the informed consent.

After receipt of the digital signature, participants were entered into a listing of participants. Using a random table of numbers, participants were randomly assigned to the computer medium conditions of Facebook® chat, Skype^{TM} videoconference, or the control (non-treatment) group. Random assignment controlled for threats to internal and external validity (Campbell & Stanley, 1963). Additionally, participants were not screened for prior relationships with other participants or facilitators, nor were they screened for involvement in other student social networks.

Setting

Participants were enrolled in advanced degree programs in a school of education at a university in Virginia. This large, private Christian university currently has an enrollment of 72,000, offering 11 doctoral programs. The university campus houses approximately 12,000 students and the remaining 60,000 students are those pursuing their educational goals through distance education. The university is accredited through the Southern Association of Colleges and Schools (SACS). The school of education programs are National Council for Accreditation of Teacher Education (NCATE) accredited.

Participants were enrolled in education courses including but not limited to Theories of Research in Educational Psychology, Theories of History and Social Foundations of Education, Issues and Trends in Exceptionality, and Education Leadership. Students earned three semester hours of college credit for each course. Participants were enrolled in at least one of the two 8-week terms during the experiment, which occurred during the Fall 2011 semester. Courses were delivered fully online.

All courses were formatted to be asynchronous and text-based. They were delivered via the Blackboard^{TM} course management system. At this particular university, all distance education courses are designed via a centralized location for the purpose of quality control. Experienced online faculty were instructors in the sampled courses delivered via the asynchronous format; however, a factor not controlled for included the technologies implemented by the individual instructors.

Computer-Mediated Communication Groups

Participants recruited were randomly assigned to one of the two synchronous CMC systems or the control group (no treatment) using a table of random numbers. Interactions occurred via the Internet using two different CMC mediums: text-based and

video-based. Participants interacted with other group members only through the assigned form of medium for the duration of the study.

Text-based CMC. Right behind Google.com™, Facebook®, is the second most accessed website in the United States according to Neilsen Media Research (Fernandes, 2011). As the most popular social networking site, Facebook® has over 800 million users. Members of Facebook® create personal profiles, allow other Facebook® friends to access their personal profiles, and exchange private messages with one another. A variety of features are available to enhance the interaction experiences with others including a "wall" where friends can post messages, share pictures, and play games simultaneously. Additionally, members can set up a common-interest group and invite friends to the group without the friends having to be previously connected on Facebook® with one another. Most interactions on Facebook® are asynchronous, but there is a chat feature to allow real-time synchronous interaction between individuals or groups. This synchronous, text-only group chat feature of Facebook® chat was used for scheduled sessions, and was the only feature used in this study. Each participant agreed to a specific time and date for the meeting. After all participants logged in, the facilitator commenced group interaction with a specified conversation starter to which participants were asked to respond. These conversation starters engaged the participants and the conversation branched off from there. Participants were not allowed to write on the common-interest group's wall or interact in an asynchronous format during the entire 8-weeks. During the first 8-week session, two Facebook® chat peer groups consisted of approximately seven participants who met once per week for a minimum 30-minute period. During the second 8-weeks, two Facebook® chat peer groups consisted of

approximately four participants. All groups had one facilitator who guided the session using the conversation starters provided.

Video CMC. Skype[TM], a well-known video-chat, has approximately 663 million users worldwide (Telecompaper, 2011). Users of Skype[TM], register under a unique, personal Skype[TM] name. The registered user is not required to set up more than a simple profile. Skype[TM] allows communication through a variety of ways including instant messaging, voice chat using a Voice over Internet Protocol (VOIP), calls to landlines, and conference calls. The most unique feature is its ability to provide synchronous, videoconferencing and with the new upgraded feature called Skype[TM] Premium, video conference calls can handle up to 10 Skype[TM] members at once. This synchronous feature of videoconferencing for up to 10 people at once was used for this study.

Each Skype[TM] participant had a headset, separate microphone, or built in microphone along with a video capturing device (e.g. Web cam). The facilitator, once logged in, invited all participants to the group. Since the facilitator had a premium subscription to Skype[TM], all members present had access to all other participants' live, passport-sized real-time images along with the ability to hear each participant's voice. All participants could talk at the same time much like face-to-face interactions. Because the images were in real-time, all social, nonverbal communication cues were available. Although Skype™ has other features that can be incorporated at the same time like text-based interactions, no other feature was allowed during the study period.

During the first 8-week session, two Skype[TM] peer groups consisted of approximately seven participants who met once per week for a minimum 30-minute period. During the second 8-weeks, two Skype[TM] peer groups consisted of approximately

four participants. All groups had one facilitator who guided the session using the conversation starters provided.

Treatment fidelity. To ensure treatment fidelity, the researcher conducted random checks during the implementation of treatment. Spot-checking ensured integrity of the project. The Facebook® facilitators were sent an email at a random time during the 8-week sessions asking them to preserve the chat log and forward it to the researcher for review. Facilitators sent the chat log following the meeting, and after review, the researcher determined the logs to be consistent with the rules and guidelines set out at the beginning of the study. The Skype™ facilitators were unable to record and forward the meetings and thus, the researcher attended randomly selected sessions. Those attended meetings were also consistent with the rules and guidelines set out at the beginning of the study.

Instrumentation

The de Jong Gierveld Loneliness Scale (de Jong Gierveld & Van Tilburg, 2006), and the Classroom Community Scale (Rovai, 2002b) were used to assess the constructs of loneliness and community, respectively. The de Jong Gierveld Loneliness Scale is an 11-item measure of both social and emotional loneliness. Participants were asked to respond to statements such as, "There is always someone I can talk to about my day-to-day problems," which assesses social loneliness versus the statement, "I miss having people around," which assesses emotional loneliness. Possible responses were "yes!" "yes," "more or less," "no," and "no!" The responses are then coded according to the corresponding scale. For the emotional loneliness scale, items are scored one point for neutral and positive responses ("more or less," "yes," and "yes!") with a range for the scale from 0 - 6. Items for the social loneliness scale receive one point for neutral and

negative responses ("more or less," "no," or "no!") with a range for the scale from 0 - 5.

The sum of the two subscales is the total loneliness score (total score range = 0 – 11).

The higher the total loneliness score, the higher the level of loneliness felt by the

participant. The scale has good reliability and validity. Reported reliability coefficients

were considered adequate for the measure of emotional loneliness and social loneliness

with .81 and .85, respectively. Congruent validity of the two constructs within the

loneliness scale (i.e., emotional and social) was determined by the similarity in the

regression coefficients across different groups tested (de Jong Gierveld & Van Tilburg,

2006). The Cronbach alphas in the present study for social and emotional loneliness were

.77 and .78, respectively and total loneliness was .83.

The Classroom Community Scale (Rovai, 2002b) was used to assess the construct

of sense of community. This measure uses a 5-point Likert scale (0 to 4) for the 20

statements presented. The overall scores range from 0 – 40 on each 10-item subscale.

The higher the score, the stronger the sense of community felt by the participant. The 20

statements asked the subject to reflect on items such as, "I feel that students in this

course/group care about each other," and "I feel connected to others in this

course/group." The author reported acceptable construct and content validity. Factor

analysis identified two subscales (connectedness and learning). Connectedness

accounted for 42% of the variance while learning accounted for 11% of the item

variance. The factors were found to be moderately related ($r = .60$, $p < .001$). Reliability

analyses were accomplished through two internal consistency estimates: Cronbach's

coefficient of .93 and the split-half coefficient of .91. Each of the subscales were also

analyzed and found to have excellent reliability (Rovai, 2002b). The Cronbach's alphas

in the present study for connectedness and learning were found to be acceptable at .82

and .79, respectively, and total community was .89.

Demographics were accessed through a demographic survey. A three-question

open-ended survey was also distributed to ask questions about participants' perceptions

of the online meetings with other students. The questions were as follows:

(1) "What did you like about meeting other students going through the program at

the same time?"

(2) "What was helpful about having a facilitator in the group?"

(3) "Do you have any other comments or reactions to the study?"

Procedures

Once IRB approval was obtained, recruitment and assignment of participants and

facilitators was accomplished, and training of the facilitators was completed,the study

began. After participants were assigned, an email was delivered to the facilitators with

the names of the participants. The facilitators then contacted, via a welcome email, their

group's members. They invited the participants to the appropriate website and scheduled

convenient interaction times.

Training in the computer medium in which the participants were randomly

assigned was provided during the first week of the study. Online tutorials much like the

ones discussed by Rockinson-Szapkiw and Walker (2009) were produced for this

research project and were provided via a link in the welcome email to all participants

based on their computer medium assignment. Participants were not required to use the

online tutorials but the tutorials were available if needed. Whether participants accessed

these tutorials is unknown. Additionally, each participant who chose to be included in

the study was assigned to a facilitator and all facilitators offered technical assistance in their welcome email.

Interactions occurred through participation in synchronous online connection meetings meant to engage distance education graduate students in social and educational interactions with other distance education graduate students. As explained in the setting section, the facilitators met with the students through the computer medium on a weekly basis for the 8-week period. The sessions were 30 minutes in length.

One week prior to the end of the study, participants received, via email, directions for completing an online survey including demographic information questions, two adapted scales (de Jong Gierveld Loneliness Scale and the Classroom Community Scale), and three open-ended questions. Most participants promptly completed the survey within one week. A follow up email was sent out a few days after the first one to encourage completion of the online survey. Participants who completed the electronic survey were placed into a drawing for one of ten $25 gas or restaurant gift cards of their choice.

Research Design and Analysis

An experimental design was used to determine if distance education students' feeling of loneliness and sense of community would differ depending on the type of computer medium (text- or video-based) used to connect distance education graduate students. This design was chosen due to its rigor, as it has been identified as one of the strongest educational research designs (Campbell & Stanley, 1963). This randomized subjects, control group, posttest only design controlled for maturation, regression, and pretest effects (Campbell & Stanley, 1963). The administration of a pretest was not used because it could have confounded the results by revealing the purpose of the study to the participants, who could have unknowingly changed their behaviors during the

experiment. The use of random assignment allowed for the assumption of the groups'

probabilistic equivalence. Thus, a posttest only design was the best experimental design

for this study (Campbell & Stanley, 1963). Qualitative data collected from open-ended

questions illuminated the quantitative data. The research questions and corresponding

hypotheses for this study are as follows:

Research Question 1: *Does the type of computer medium used to facilitate online*

graduate students' peer interactions affect the participant's feelings of loneliness?

H1: Distance education graduate students who interact with other students

utilizing different computer mediums (Facebook® chat or Skype^{TM}) will demonstrate a

statistically significant difference in their feelings of loneliness as measured by the de

Jong Gierveld Loneliness Scale (de Jong Gierveld & Van Tilburg, 2006).

H1.1: Distance education graduate students who interact with other students

utilizing different computer mediums (Facebook® chat or Skype^{TM}) will demonstrate a

statistically significant difference in their feelings of social loneliness as measured by the

de Jong Gierveld Loneliness Scale (de Jong Gierveld & Van Tilburg, 2006).

H1.2: Distance education graduate students who interact with other students

utilizing different computer mediums (Facebook® chat or Skype^{TM}) will demonstrate a

statistically significant difference in their feelings of emotional loneliness as measured by

the de Jong Gierveld Loneliness Scale (de Jong Gierveld & Van Tilburg, 2006).

Research Question 2: *Does the type of computer medium used to facilitate online*

graduate students' peer interactions affect the participant's sense of community?

H2: Distance education graduate students who interact with other students utilizing

different computer mediums (Facebook® chat or Skype^{TM}) will demonstrate a

statistically significant difference in sense of community as measured by the Classroom Community Scale (Rovai, 2002).

Qualitative Research Question 3*: What was useful about participating in online, synchronous peer facilitated interactions with other distance education graduate students?*

Quantitative analysis. A multivariate analysis of variance (MANOVA) was used to assess the differences in participants' feelings of loneliness based on the group assignment. The MANOVA was chosen because it tests the significance of group differences between two or more groups and is used when there are two or more correlated dependent variables (e.g. social and emotional loneliness). According to Keselman et al. (1998), the importance of a MANOVA is that it can control for the correlation expected to exist between the dependent variables. Keselman et al. suggests approximately 20 participants per group to increase statistical power. For the current study, each group had at least 20 participants.

Prior to conducting the MANOVA, preliminary assumption testing was conducted. Tests of normality included inspection of box plots. Univariate and multivariate analyses were completed, employing a Shapiro-Wilk test for normality. Mahalanobis distance was calculated to test for multivariate normality. Correlations were analyzed to evaluate assumptions for linearity, singularity, and multicollinearity. Assumption testing for homogeneity of variances was completed using Box's *M* test.

A one-way analysis of variance (ANOVA) was conducted to investigate the difference between participants' sense of community based on the group assignment. Although the MANOVA was originally planned to test the difference between groups in sense of community, results of assumption testing revealed the ANOVA to be the more

appropriate statistical analysis. Further discussion of results may be found in Chapter Four. Preliminary assumption testing was conducted. Tests of normality included inspection of box plots. Univariate and multivariate analysis were completed employing a Shapiro-Wilk test for normality. Correlations were analyzed to evaluate assumptions of linearity, singularity, and multicollinearity. Assumption testing for equality of groups was completed using Levene's test of Equality of Error Variances.

The level of significance is used to determine when a significant difference occurs by chance. The significance level was set at $p < .05$, which is acceptable for education research. The effect sizes for both analyses were reported with partial $\eta2$ and interpreted using Cohen's (1988) threshold of .01 for small, .06 for medium, and .14 for large.

Qualitative analysis. Responses to the three open-ended questions were analyzed using a qualitative approach to data analysis (Taylor-Powell & Renner, 2003). The approach of Taylor-Powell and Renner is a five-step process. The steps are outlined as follows:

(1) know the data – read and re-read the data and think critically about the similarities and differences in the data,

(2) focus the analysis – look at how the groups responded to each of the open-ended questions,

(3) categorize the information – categorize the data by themes and organize into coherent groupings by allowing the categories to emerge from the data,

(4) identify the patterns and connections – look for patterns within and between the categories, and

(5) interpret the data – use the themes to explain the findings.

Taylor-Powell, and Renner (2003) cautioned the analyzer to avoid generalizations and to choose quotes carefully to reflect the categories accurately.

It is also important to address limitations and alternative interpretations. The actual number of responses for each category was small, which limited the scope of generalization to all participants. Additionally, emergent themes needed to appear and reappear before commitment to the theme. Alternative interpretations were addressed during all steps but most importantly during Step 4, making certain the data interpretation was intertwined with the emerging patterns and connections during Step 3.

Summary

The focus of this quantitative study was to determine if there was a difference in distance education graduate students' sense of community and feelings of loneliness if they interacted with peers using two different computer mediums (text- and video-based). An experimental, control group, posttest only design was utilized and considered the best choice to control for a variety of extraneous effects. The results of the study are described in Chapter Four.

CHAPTER FOUR: RESULTS

This chapter is divided into three sections. The first section consists of the

descriptive statistics for the entire data set immediately followed by the data

disaggregated by group (Facebook® chat, Skype™, and Control). The second section

includes the results for the inferential statistics that were conducted to answer the

principal research questions: (a) Does the type of computer medium used to facilitate

online graduate students' peer interactions affect the students' feelings of loneliness? and

(b) Does the type of computer medium to facilitate online graduate students' peer

interactions affect the students' sense of community? The final section consists of the

results of the qualitative analysis of the responses to the open-ended questions. The

results were analyzed and reported according to the work of Taylor-Powell and Renner

(2003). To enhance the results of the qualitative analysis, select quotations were used

from the data and presented for clarity and confirmation of categories that emerged from

the data analysis.

Descriptive Statistics

The pooled means and standard deviations for the de Jong Gierveld Loneliness

Scale (de Jong Gierveld & Van Tilburg, 2006) variables of social loneliness and

emotional loneliness were $M = 2.10$ ($SD = 1.86$) and $M = 1.89$ ($SD = 1.84$), respectively.

These subscales are combined to create a total loneliness scale ($M = 3.98$, $SD = 3.20$).

The means and standard deviations for the Classroom Community Scale (Rovai, 2002b)

variables of connectedness and learning were $M = 22.71$ ($SD = 6.10$) and $M = 24.81$ (SD

$= 5.98$), respectively. These subscales are combined to create a total community scale (M

= 47.52, *SD* = 11.41). Table 4 provides the descriptive statistics for the dependent

variables disaggregated by group assignment.

Table 4

Descriptive Statistics for the Dependent Variables Disaggregated by Group Assignment

	Facebook® chat (*n*=21)		Skype™ (*n*=20)		Control (*n*=21)	
Variable	*M*	*SD*	*M*	*SD*	*M*	*SD*
deJong Gierveld Loneliness Scale						
Social Loneliness	2.57	2.01	1.85	2.01	1.86	1.53
Emotional Loneliness	2.10	1.64	1.85	2.01	1.71	1.92
Total Loneliness	4.67	3.12	3.70	3.51	3.57	3.01
Classroom Community Scale						
Connectedness	24.33	5.81	21.10	7.35	22.62	4.82
Learning	23.81	5.68	24.40	6.50	26.19	5.78
Total Community	48.14	11.20	45.50	13.26	48.81	9.93

Inferential Statistics

Loneliness. A one-way multivariate analysis of variance (MANOVA) was

conducted to investigate the null hypothesis. The null hypothesis states, "distance

education graduate students who interact with others students utilizing different computer

mediums (Facebook® chat, Skype™, and Control) will not demonstrate a statistically

significant difference in feelings of social and emotional loneliness as measured by the de

Jong Gierveld Loneliness Scale" (de Jong Gierveld & Van Tilburg, 2006).

Preliminary assumptions testing was completed to test for normality, linearity, singularity, multicollinearity, and homogeneity. Normality testing consisted of the inspection of box plots to evaluate the presence of extreme cases (outliers). The assumption of extreme outliers was tenable for each variable, including the subscales and the composite scores.

To evaluate the assumptions of univariate and multivariate normality, Shaprio-Wilk tests for normality were completed. Normality on the dependent variables of social loneliness, emotional loneliness, and total loneliness was not tenable for any group. To test multivariate outliers, the Mahalanobis distance values were assessed using χ^2 (2, $N =$ 62) = 13.816, p < .001. The results show the Mahalanobis distance maximum value for loneliness was 6.736 and below the obtained value of 13.816, indicating the multivariate normality tested by Mahalanobis distance may not be a problem. However, univariate normality is a necessary condition for multivariate normality (DeCarlo, 1997); therefore, multivariate normality is not tenable.

In inferential statistics, the MANOVA is often the statistic of choice even when normality issues are present. The MANOVA is considered reasonably robust when there are violations of normality as long as there are at least 20 in each cell (Tabachnick & Fidell, 2007). Although the latter requirement was at the cutoff, it was argued the MANOVA was deemed an acceptable analysis for this study. Results of the examination of linearity, singularity, and multicollinearity were tenable. The correlation between social loneliness and emotional loneliness was considered moderate, $r = .49$, $p < .01$.

The MANOVA assumes groups are balanced and equal, or homogenous, and a tenable assumption improves the robustness of the test. However, when the data are unbalanced, a test of the equality of covariance, or Box's M test, is warranted

(Tabacknick & Fidell, 2007). The assumption of homogeneity of variance-covariance was tenable based on Box's test, $M = 3.327$, $F (6, 854522) = .527$, $p = .79$.

The results of the MANOVA yielded no statistically significant difference between the three groups on linear combination of loneliness variables, Pillai's Trace = .035, $F (2, 118) = .529$, $p = .714$ partial $\eta^2 = .01$. Pillai's Trace was used, instead of the Wilks' Λ, because it is a more robust test when assumptions are violated (Tabacknick & Fidell, 2007). The observed power was .17, indicating a 17% chance the results were significant. Based on these findings, evidence was insufficient to reject the null hypothesis: Distance education graduate students who interact with others students utilizing different computer mediums (Facebook® chat, Skype^{TM}, and Control) do not demonstrate a statistically significant difference in measured feelings of loneliness. However, a Type II error is probable.

Community. A one-way analysis of variance (ANOVA) was conducted to investigate the null hypothesis stating, "distance education graduate students who interact with other students utilizing different computer mediums (Facebook® chat, Skype^{TM}, and Control) will not demonstrate a statistically significant difference in measured sense of community." Although the MANOVA was originally planned to test the difference between groups in sense of community, results of assumption testing revealed the ANOVA to be the more appropriate due to the highly correlated subscales for connectedness and learning, $r = .82$, $p < .01$. According to Tabacknick and Fidell (2007) correlations around .80 are reason for concern and they suggest variables be combined or removed. Therefore, the ANOVA was completed using the total community scale, which is a combination of the subscales of connectedness and learning, to investigate the

differences in measured variables of total community between the Facebook® chat, Skype^{TM}, and Control groups.

Preliminary assumption testing was completed on the dependent variable of total community. Box plot analysis found no extreme outliers for this variable and concluded the assumption tenable. Tests of the assumption of univariate normality were completed using Shaprio-Wilk tests for normality. Normality on total community was tenable in the Skype^{TM} and Control groups, but not the Facebook® chat group. The assumption of equality of error was assessed using Levene's test of equality of error. Results were tenable for total community, $F (2, 59) = 1.119, p = .33$.

The results of the ANOVA yielded no statistically significant difference between the Facebook® chat, Skype^{TM}, and Control groups on the dependent variable of total community, $F (2, 59) = .47, p = .627$. The observed power was .12, indicating a 12% chance the results were significant, and thus, indicated the high probability of a Type 2 error. The results of the statistical analysis indicated there was insufficient evidence to reject the null hypothesis: Distance education graduate students who interact with other students utilizing different computer mediums (Facebook® chat, Skype^{TM,} and Control) do not demonstrate a statistically significant difference in measured sense of community. A Type II error is again probable.

Qualitative Survey Results

Open-ended survey responses provided supplementary information relative to students' sense of connectedness and feelings of loneliness. Questions 13 through 15 gave participants who participated in treatment an opportunity to give feedback about their experience of having a facilitator, meeting other students, and any other comments they may have had related to their experience in the study. Responses from those

participants in the Facebook® chat ($n = 21$) and Skype™ group ($n = 20$) were analyzed

using a qualitative approach to data analysis (Taylor-Powell & Renner, 2003). Only two

participants in the Control group responded to the third question with a comment

indicating they would have "liked the opportunity to be included in the study," therefore,

those results did not require formal analysis. The results of the analysis, which are

disaggregated by computer medium assignment, are reported in the tables that follow.

Response to having a facilitator. Question 13 asked participants to respond to

the following, "What did you like about having a mentor/facilitator?" Of the 21

Facebook® chat participants, 17 provided a response. Themes that emerged and their

frequency are delineated in Table 5. Of the 20 Skype™ subjects, 18 provided a response.

Themes that emerged and their frequency are delineated in Table 6.

Table 5

Significant Themes from Facebook® chat Group – Having a Facilitator

Theme	Frequency	Frequency Total Percent (%)
No response		4 (19%)
Competence		6 (29%)
Knowledgeable/experienced	2	
Helpful; Answered general questions	2	
Direction	1	
Supported communication	1	
Administrative		5 (24%)
Organized (gave agenda and questions)	3	
Scheduled meetings	2	
Relational		3 (14%)

Positive social interactions	1
Encouraged relationships	2

Results of the qualitative analysis of Facebook® chat participants indicate that

having a facilitator was seen as positive. Six (29%) participants believed the facilitator

was considered competent by making statements such as, "Thought someone

knowledgeable could answer questions and help guide discussions" and "I received a

wealth of information regarding things to look forward to as far as my future

responsibilities in this program." Three (14%) participants reported interacting with the

facilitator and other students created a social connection in the group with the following

statements, "I really enjoyed interacting with other students regarding courses they were

taking on-line;" "Our facilitator was very helpful and nice;" and "She was an

encourager." The only comments not considered positive or negative related to personal

issues, which precluded consistent involvement. These were reported as scheduling

conflicts and personal organizational issues. Overall, participants were positive about the

experience of using the text-based computer platform known as Facebook® chat. The

facilitator helped to create a supportive and structured environment in the text-based

medium.

Table 6

Significant Themes from Skype^{TM} Group – Having a Facilitator

Theme	Frequency	Frequency Total Percent (%)
No response		2 (11%)
Competence		7 (39%)
Facilitators seen as knowledgeable/experienced		

/invaluable	2	
Answered questions about dissertation process	2	
Provided feedback to support learning	1	
Provided support for educational decision making by students	2	
Administrative		5 (28%)
Organized (gave agenda and questions)	1	
Someone responsible for keeping meeting going	3	
Point of contact	1	
Connectedness		4 (22%)
Created feeling of connectedness	1	
Encouraging	1	
Helped the group connect	3	
Negative Comment		1 (1%)
Facilitator was negative and disorganized	1	

Results of the qualitative analysis of Skype^{TM} participants indicated that having a facilitator was also seen as positive. Seven (37%) participants believed the facilitator was considered competent with statements such as, "I appreciate the insight he gave into the dissertation process;" "It was very informative about possible problems which may be encountered during the dissertation process;" and "It is very important to share the problems and discuss the solution with the facilitator." Students appreciated the administrative support provided by the facilitator, as five (28%) commented on the skill of organizing the meeting, persisting in getting together, and keeping the group going.

Four (22%) participants reported having a facilitator created a feeling of connectedness with the following statements, "It gave me a feeling of connectedness to (the university) and allowed interactions that do not normally happen with someone who has already traveled more of the road than I have;" and "Nice to make face-to-face contact and discuss things with someone who has experienced what I am going through." There was one (1%) negative comment about a facilitator not being organized, which was, "The facilitator was negative in general." Overall, participants were positive about the experience when utilizing Skype^{TM}, the video-based computer program, which allowed face-to-face interactions.

Response to meeting other students. Question 14 asked students to respond to the following question, "What did you like about meeting other students going through the program at the same time?" Of the 21 Facebook® chat subjects, 18 provided a response. Themes that emerged and their frequency are delineated in Table 7. Of the 20 Skype^{TM} subjects, 18 provided a response. Themes that emerged and their frequency are shown in Table 8.

Table 7

Significant Themes from Facebook® chat Group – Meeting Others

Theme	Frequency	Frequency Total Percent (%)
No response		3 (14%)
Shared Concern		4 (22%)
Discussed difficulties of online learning	3	
Learned about problems with different professors	1	
Connectedness		12 (57%)
Positive experience connecting with others		

Going through the same things	2	
Feel connected to the other students	5	
Good to get to know other students	2	
Wanted to spend more time in discussion	1	
Shared experiences	2	
Learning		3 (14%)
Very informative	2	
Learned from others who are at different stages	1	
Negative Comment		1 (1%)
Prefer online class interactions	1	

Results of the qualitative analysis indicated participants were very positive about the experience of meeting others from the same university who were experiencing similar issues. Four (22%) participants reported the importance of meeting other students to discuss difficulties facing online students and the helpfulness of sharing negative information about professors. The majority of responses (57%) related to connectedness with fellow students. The participants reported positive comments about interacting with others with statements like, "Felt connected and shared experiences;" "It helped me feel more connected;" "I loved meeting the doctoral students;" "The interactions were very helpful;" and "It is interesting to know how other's life (sic) are similar to mine." Two (14%) participants believed meeting other students enhanced their learning. A seemingly negative comment (1%) was made relative to the participants in the group making comments not helpful to the commentator, but the overall experience appeared to be positive about learning from others at different levels in the program. The comment was

"I prefer interacting with those in my online classes. What I read others (sic) in

the facebook wrote was 'the intensive almost killed me.' Really the one I am is

(sic) really a nothing class. It can be beneficial to interact with others at different

levels of the program."

Overall, the responses indicate participants were positive about sharing their experiences

with others, connecting with those who are studying at a distance, and learning from

others in the text-based medium of Facebook® chat.

Table 8

Significant Themes from Skype^{TM} Group – Meeting Others

Theme	Frequency	Frequency Total Percent (%)
No response		2 (10%)
Shared Concern		2 (10%)
Discussed difficulties of online learning	1	
Concerns related to dissertation process	1	
Connectedness		9 (45%)
Positive experience connecting with others going through the same things	2	
Feel connected to the other students	2	
Good to get to know other students	2	
Shared experiences	1	
Reduce loneliness	2	
Learning		2 (10%)
Very informative	1	
Learned from others at different stages	1	

Positive Comment		2 (10%)
I liked it	2	
Neutral Comment		2 (10%)
Never met other students – only facilitator	2	

Results of the qualitative analysis indicated participants were very positive about the experience of meeting others. Two (10%) participants reported the importance of meeting other students to discuss difficulties facing online students and concerns about the dissertation process. Like the Facebook® chat group, the majority of responses (45%) related to connectedness with fellow students. Similarly, the participants reported positive comments about interacting with others with statements like, "I feel that I really connected to some of the other students that do not normally happen. I know things about them and their lives that make me feel invested in them;" "It was good to talk to people who have already gone before me in courses;" "Helped me to understand that I was not in this alone;" "Felt as if I formed somewhat of a personal relationship with some;" and "It is important to share experiences with other students." Two (10%) participants also believed meeting other students enhanced their learning. There were two (10%) general comments of "I liked it," and two (10%) neutral comments, both reporting their only contact was with the facilitator, as other students were absent during the times they were present. Overall, the responses indicated participants were positive about sharing their experiences with others, connecting with those who are studying at a distance, and learning from others in the face-to-face medium of Skype^{TM}.

Any additional comments. Question 15 asked students to respond to the following question, "Any other comments or reactions to the study?" Of the 21

Facebook® chat participants, 18 provided a response. Themes that emerged and their

frequency are delineated in Table 9. Of the 20 Skype™ participants, 15 provided a

response. Themes that emerged and their frequency are shown in Table 10.

Table 9

Significant Themes from Facebook® chat Group – Additional Comments or Reactions

Theme	Frequency	Frequency Total Percent (%)
No response		3 (14%)
Connectedness		4 (22%)
Enjoyed getting to know other students	1	
Group discussion was positive	1	
Felt like mentoring relationship	1	
Felt like a family	1	
Positive Reactions and Comments		3 (14%)
Would love to read the results	1	
Would do it again	1	
Enjoyed the study	1	
Negative Reactions and Comments		9 (50%)
Technology Issues	1	
Felt artificial to only be allowed to text/chat	1	
Facilitator not organized	2	
Poorly structured meetings	2	
Too many educational degrees represented	1	
Timing not always convenient	2	

Results of the qualitative analysis indicated Facebook® chat participants had both positive and negative final comments. Four (22%) participants reported the importance of connectedness and these comments were not overlapping prior responses. Thus, these were four additional responses reporting the feeling of connectedness. Although there were 9 (50%) comments considered negative, these comments targeted frustration with the limitations of the study. For example, in the text-based environment of Facebook® chat, students were not allowed to write on the Facebook® group's wall nor were they allowed to contact each other outside the prescribed meeting time. Therefore, the comment referring to the experience as being "artificial" was related to a desire to be able to talk with the other students regularly and without constraint. Another subject was "disappointed" the facilitator did not have questions prepared for the group discussions and meeting reminders were sent out too far in advance. Overall, the responses indicated participants appreciated the experience despite the negative issues.

Table 10

Significant Themes from Skype^{TM} Group – Additional Comments or Reactions

Theme	Frequency	Frequency Total Percent (%)
No response		5 (25%)
Connectedness		3 (20%)
Supporting each other through the process	1	
Desired more interactions	1	
Needed in the beginning of the program	2	
Positive Reaction and Comments		7 (47%)
Enjoyed the study	1	
Wish could have participated regularly	3	

Loved the different levels of students	2	
Went smoothly	1	
Negative Reaction and Comments		5 (33%)
Technology Issues	5	

Results of the qualitative analysis indicated Skype™ participants had both positive and negative final comments. Three (22%) participants reported the importance of connectedness and two comments were from the same participant in response to Question 14. Although there were 5 (33%) negative comments, they all related to technology issues with Skype™. Participants' comments included "Skype™ was very frustrating for all of us...I think that connecting with each other is very beneficial and should happen more often;" and "Unfortunately in my area of Florida the only option for Internet is dial-up and it did not work very well for Skyp (sic)." Overall, the responses indicated participants appreciated the experience of meeting with others.

Summary

The results of the data analysis were unable to reject the null hypotheses to the principal research questions: (a) Does the type of computer medium used to facilitate online graduate students' peer interactions affect the students' feelings of loneliness? and (b) Does the type of computer medium to facilitate online graduate students' peer interactions affect the students' sense of community? The results suggest Type II errors are probable for the inferential statistical analyses. However, results of the qualitative analysis were beneficial in shedding light on the experience of distance education graduate students' encounters with peer facilitated interactions and the development of an online community of practice.

CHAPTER FIVE – DISCUSSION

Lack of community and feelings of loneliness has been identified as an explanation for students abandoning their online educational pursuits of higher education (Rovai & Wighting, 2005). When students feel disconnected and lonely, their learning can also be negatively affected (Ouzts, 2006; Rovai, 2002a, 2002b). Community is also a key component to supporting learning (Allen, Bourhis, Burrell, & Mabry, 2002; Rovai, 2002c). Traditional universities recognize this and provide educational opportunities along with social clubs and events designed to create community. With the advent of the Internet and the unique capabilities of CMC systems, universities offering online programming can equitably address this need for their distance education students.

The purpose of this quantitative study was to determine if there was a difference in feelings of loneliness and sense of community after interacting with other students in peer facilitated groups using synchronous text- or video-based CMC technologies. The following three research questions were examined: (a) Does the type of computer medium used to facilitate online graduate students' peer interactions affect the participant's feelings of loneliness? (b) Does the type of computer medium used to facilitate online graduate students' peer interactions affect the participant's sense of community? and (c) What was useful about participating in peer facilitated interactions with other distance education graduate students?

Quantitative study results revealed no statistically significant difference in loneliness or community, based on the type of computer medium used to facilitate online graduate students' peer interactions. There was no difference between the synchronous CMC groups and the control group. These results suggest introducing social interactions

with other distance education students was not found to impact loneliness and sense of community. Although quantitative results showed interactions with other distance students had no impact on loneliness and community, qualitative analysis of responses to open-ended questions indicated adult learners viewed their interactions on all mediums positively and welcomed additional opportunities for interacting with other students while studying at a distance.

Interpretation of Results

Quantitative Analysis

Loneliness. For this study, the results of the quantitative analysis provided evidence there was no statistically significant difference in feelings of loneliness among students who interacted in peer facilitated groups using synchronous text-based CMC systems compared to those students who used synchronous video-based CMC systems. There was no difference between these synchronous CMC groups and the control group.

These results may be understood best in light of previous research on loneliness. Loneliness and the use of the Internet have been studied (Morahan-Martin & Schumacher, 2003) and there are two hypotheses related to loneliness. The first hypothesis suggests Internet use causes loneliness, while the second suggests lonely people are drawn to the Internet. The premise behind the first hypothesis is the amount of time online interrupts real life relationships and isolates the individual from the real world, reducing the sense of belonging and connection to the world (Morahan-Martin & Schumacher, 2003). Distance education students spend an exorbitant amount of time in front of their computers, often neglecting time with family and friends. This could lead to situational loneliness specifically related to the stresses of studying at a distance, raising a family, and working outside the home – all defining characteristics of the

nontraditional distance education graduate student. In this study, participants made comments indicating their group was feeling like a "family" and could suggest interacting with others was a positive replacement to the relationships currently "on hold" during their educational pursuits.

The second hypothesis suggests lonely people are drawn to the Internet. Lonely individuals are drawn to the Internet, as social interactions are altered in ways, which makes it an attractive alternative to face-to-face interactions. These two hypotheses suggest a state vs. trait view of loneliness. In this study, distance education graduate students may have been less likely to have been identified with a loneliness trait and more likely to have felt isolated and alone in the process of pursuing their educational goals. Isolation in distance education should more accurately be defined as a "state" of social loneliness, or as de Jong Gierveld et al. (2006) defined as the absence of a broader group of contacts or engaging social network. The de Jong Gierveld Loneliness Scale assessed this social loneliness factor with that definition in mind. However, the participants within this study may have had a group of contacts and a social network, but not one specifically related to their educational pursuits. This type of resultant loneliness may not be assessed adequately with this measure.

Consistent with previous findings on loneliness and marriage (Stark, 1998), married individuals are significantly less lonely than their non-married counterparts, while married couples with children are even less lonely than childless couples. The sample in the current study was predominantly married with children and therefore, already within the "less lonely" category of loneliness, thus making it more difficult to see any changes in loneliness within individuals.

Community. Results also provided evidence there was no statistically significant difference in sense of community among students who interacted in peer-facilitated groups using synchronous text-based CMC systems or those using synchronous video-based CMC systems. Additionally, no difference was found between the CMC groups and the control group. The current study sampled students from the overall population of distance education graduate students and attempted to develop a sense of community in a synchronous discussion one time per week. Participants in the current study were not matched on any similar interest, specific course taken, personal interests, or anything that would have given them some similarity to other group members outside of studying education at the same university. The only common variables between the participants prior to the study were being enrolled at the same university and majoring in the field of education.

Participants were additionally constrained by a restriction on interaction time, as they were not allowed individual interactions with group members or interactions with the large group outside the single, weekly 30-minute interaction. Kreijns and his colleagues (2003), in their work on understanding how social interactions support collaboration, found when groups are formed that have "zero-history" (p. 342) time is necessary for the "getting to know you, can I trust you, and do I belong with this group?" to be accomplished before group collaboration can truly begin. In this study, time was severely limited and surely impacted the development of trust and belongingness enough to produce insignificant results on a measure of community. Not only was this not an optimal amount of time over an 8-week period to really develop a sense of community, but it also raises the question of whether sense of community is developed best when it occurs in large group interactions or if the development of co-relationships between

members of subgroups of the overall community can more effectively enhance overall community development.

Previous studies on group cohesion, (another term for community), is more immediacy related (Baker & Woods, 2004) and can be felt and observed quite quickly within a classroom during a semester and among those with similar interests (Gunawardena, 1995; Rourke, et al., 1999; Vrasidas & McIsaac, 1999). In this study, participants had no known prior relationship with members, no focused goal such as in a classroom, were severely limited in time allowed to interact, and were constrained by type of computer medium. Therefore, immediacy was limited and could have constricted the development of community. Additionally, and perhaps more importantly, CoP best develops when individuals have like goals, which become common group goals as the community develops. Although the participants were all education students, they were from different educational courses, had different degree plans (Ed.S. or Ed.D), and were in different places within their educational timeline. All of these factors appear to have limited the development of community as measured by the CCS.

Qualitative Analysis

The open-ended questions on the survey were analyzed to provide more in depth information about the experience not directly assessed via the quantitative measures. Participants were asked to respond to three questions: (a) What did you like about having a facilitator? (b) What did you like about meeting other students going through the program at the same time? and (c) Any other comments or reactions to the study? Participants in the control group did not provide answers to the first two questions, but responded to the third question with general statements indicating they would have liked

to be included in the study. Therefore, the reader is cautioned that the results of the qualitative analysis are from participants in the Facebook and Skype™ groups only.

Having a facilitator. The two synchronous CMC groups were very similar in their positive comments related to having a facilitator during the study. Themes identified during the qualitative analysis included the facilitator's competence, administrative skill, and the importance of relational skill or connectedness.

Competence. The competence of the facilitator was an important aspect of an effective group. An example of competence of the facilitator was noted in similar comments such as, "I appreciated any feedback (negative or positive) from facilitator that might help me do better in my class;" and "Open communication and willingness to listen to questions and challenged me appropriately in my thinking." In this study, the participants valued having an experienced individual from which to glean specific information about the dissertation process (an overwhelming concern by many students). Comments included, "I appreciated the insight he gave into the dissertation process;" and "It was very informative about possible problems which may be encountered during the dissertation process." These comments indicate the importance of learning within a community (Rovai, 2002b) and having more knowledgeable others from which to gain experience and wisdom (Vygotsky, 1978).

These qualitative results are consistent with the theoretical framework of CoP. Wenger (1996) identified the basic elements of a learning organization, which included the assumption "learning is fundamentally social" (p. 22). This learning is much like the functioning of an apprenticeship program with the facilitator functioning like Vygotsky's (1978) *more knowledgeable other* in the *zone of proximal development* and the participant gleaning what he or she can from the more experienced member.

Administration. Members of both groups welcomed the administrative qualities of the facilitator equally. Having someone organize, remind, and prepare the group for the meeting was often expressed as a positive component to the success of the group. Participants commented with statements like, "He kept everything organized; gave us an agenda and questions;" and "He was very persistent about getting together and easy to talk to." These comments demonstrate the central importance of the facilitator, who was the only common link between group members in the early stages of group development. Research on instructor-student relationships supports the importance of positive feelings toward the instructor to influence attraction to the group (Baker & Woods, 2004). In this study, the facilitator may have been viewed as an instructor, and therefore, positive facilitator-student relationships may have helped establish group bonds.

Relational and connectedness. A difference was noted between the Facebook® chat and Skype^{TM} groups related to their perception of the facilitator and his or her relationship to the group. There was a sense the Facebook® chat and Skype^{TM} groups differed in the way the participants reported the connectedness felt in the groups. Several participants viewed the facilitator in the Facebook® chat group as relational. They purposed that the facilitator focused on sustaining interaction during the group time. Comments included simple statements like, the facilitator was "...an encourager" and "...outgoing and friendly [who] kept our group chatting." Like the Facebook group, the Skype^{TM} group participants viewed the facilitator as an encourager. They also purported the facilitator not only focused on keeping the "group chatting," but on creating connections between and among group members. This focus resulted in participants feeling a sense of connectedness; one participant commented, "It gave me a feeling of

connectedness to (the university) and allowed interactions that do not normally happen with someone who has already traveled more of the road than I have."

Meeting others. Much like the responses related to having a facilitator, participants enjoyed the camaraderie with other students. Themes indentified included shared concern of group members, connectedness to other members of the group, and the importance of learning from others.

Shared concern. Participants in both the Skype and Facebook groups similarly reported the study provided them with the opportunity to share concerns with other distance education graduate students about the program, professors, and online learning issues. The students appeared to relate a sense of relief in having others with whom to discuss difficulties. Comments included, "It was nice to discuss the difficulties that we are facing while taking an online degree [and] it was good to talk to people who have already taken certain classes or comps and find out their experiences;" and "Learning about some problems with various professors." In this study, shared concern for one another and program discussion encouraged the participants to attend the group interactions and also ask to continue the interactions after the study was over. The participants valued the interactions and were beginning to develop a sense of shared interest and common goals, which according to the research, are all foundational principles to the establishment of community (Glynn, 1981; McMillan & Chavis, 1986).

Connectedness. Nearly half of all respondents in either the text- or video-based group reported a feeling of connectedness with other group members. The Facebook® chat group had slightly more responses related to feelings of connectedness than the Skype™ group (57% to 45%) but the quality of the responses was similar. These connections were noted in comments like, "I felt that I really connected to some of the

other students in ways that do not normally happen. I know things about them and their

lives that makes me feel invested in them;" "I was able to meet via Facebook some

students that were in the same class as I was and others who I may not get a chance to

have in the same classes. I liked that people were at completely different points in their

educational journeys and as one of the students who is just beginning, it was really

helpful to hear some problems and helpful hints from some students who are almost

finished with their program;" and "I liked that. It was good to see where some of the

other students were at in their progress toward their degree and what their issues were. It

helped me feel more connected." The connections increased toward the end of the 8-

week session, but it may be that CCS did not measure the type of connectedness

described by participants. This is discussed in the limitations of the study.

    Learning. Approximately 10% of the participants within each group reported

learning from group members. Participants reported group interactions were "very

informative" and helped understand better the "dissertation process." Comments like, "I

was okay if we could have spent more time in discussion," indicate the value placed on

the group for gleaning as much information as possible in the short amount of time

allotted for group interactions.

    The structural elements in the CoP framework include domain, community, and

practice. The third element of practice claims learning to be an engagement in social

practices (Wenger, 1996). Much of the CoP remains informal. A discussion around the

water cooler is often the venue for successful participation and learning within a

community of practice. Therefore, within the interactions in this study, members were

engaged in informal discussions about various topics related to their educational pursuits,

and some of the participants reported having their fears allayed about the dissertation process. This is an excellent example of practice within a community of practice.

The foundational principles of community were beginning to form through group sharing of concerns and connecting and learning from others. According to Wenger (1996), this joint learning through the process of engagement affected the individuals' identities by "changing their sense of how they can engage with the world" (p. 24). One participant stated, "... it would be great if there could be a way to form a similar group for discussion with or without a facilitator so that us on-line Ed.S and Ed.D students have a place to meet up and talk." The resultant outcome to this study was that participants had learned much from involvement in the group and now felt a level of competence to be able to reach out to others and meet their needs as their own needs had been met. Vygotsky (1978) would likely say that the participants had achieved a mastery status in which they could now consider themselves the "more knowledgeable other" and could go on to mentor others.

Any additional comments. Any last and final comments by the participants were evaluated. Themes identified included connectedness, general positive remarks, and a few negative reactions to the study.

Connectedness. Again, participants wanted to add final comments about the connectedness they experienced within the groups. As discussed in the literature review, Lee & Robbins (1995) suggested the constructs of companionship and affiliation are the building blocks for connectedness, which allow individuals to see themselves as united to the world around them. The process of getting to know, trust, and have a sense of belonging to a group are all interconnected and are the foundational components to community.

The responses related to connectedness were equivalent between groups (Facebook 22%; Skype 20%). Students reportedly felt as though these new relationships were "like a family" and sensed the facilitator and other members in the group were in a mentoring relationship. Participants enjoyed getting to know others and reported, "I really liked that we were able to become a sounding board for each other and bounce ideas off one another and help each other out in our educational journeys. I hope to add the people in my group as "friends" on my [personal]Facebook and continue talking with them about concerns or ideas that we may have;" and "I enjoyed getting to know other student (sic) regarding the process of getting an online degree."

Much like the structural element of "practice" in the CoP framework, Wenger and Snyder (2000) found communities of practice within business transfer best practice knowledge within an organization as well as develop professional skills through mentorship-like relationships. Participants in this study found a new avenue from which to access information outside of their online courses and the opportunity to "bounce ideas" off others may lead to the honing of professional skills that may have not otherwise occurred within the confines of the distance education courses.

Positive reactions. Participants expressly stated interactions like these should be included at the beginning of the educational program. More interaction was also inferred from the responses; participants wanted more time for discussion and interaction. Although not expressly stated, the participants did not consider the once weekly 30-minute group sessions adequate. These results are consistent with the findings in the literature related to the isolation distance education students often report in retention studies (Angelino, Williams, & Natvig, 2007; Glomb et al., 2009; Simpson, 2003; Venter, 2003).

In a study by Glomb and her colleagues (2009), the issue of isolation in distance education for rural learners was addressed. Students in this program attended synchronous classes (regionally separated students met face-to-face for a synchronous video class) in regional campuses every other week but still cited isolation as primary reasons for dropping out. Therefore, twice-monthly face-to-face interactions were not adequate to counteract isolation. After including regional mentoring into the program, which was described as much like a community of practice, students reported a greater sense of connectedness with others and with the institution. Students were overwhelmingly positive about the experience and the retention rates significantly increased for the university. This supports the notion that social opportunities are a necessary but not sufficient aspect of the development of connectedness (Hill, Song, & West, 2009; Kreijns et al., 2003; Lee & Robbins, 1995), and this finding was evident in the current study.

Negative reactions. The most prevalent negative reaction to the study was technical difficulties. Participants were frustrated by the video-based CMC system of Skype. Comments like, "Skype was very frustrating for all of us, and I have used ooVoo and had much better luck with it. I think the connecting with each other is very beneficial and should happen more often," showed the frustration over the medium but not the interactions. The development of community from a distance is contingent upon reducing the negative influences of the CMC system. According to Vygotsky (1978), a CMC system could be considered a tool used to make a task easier, but even more so, it can change the way individuals think about a task, approach a task, and even the very nature of the task itself can be altered with a tool. Vygotsky referred to this as "mediation" (p. 29) and when tools are used to interact, it is like an extension of human capability.

However, nothing has been discussed in the literature about when the tool doesn't work properly. Findings from the current study suggest when the tool was not working properly, participants experienced a type of cognitive dissonance resulting in a frustration with the CMC system, which possibly altered their reactions to the study.

Additional negative comments were related to group educational diversity and the structure of meetings. A few participants were negative about the educational diversity of having Ed.S. and Ed.D. students within the same groups by stating, "I recommend only offering it to Ed.D.students." A few negative comments were made about the structure of the meetings when participants stated, "I thought the communication was poor. I received very little information at the beginning and was not able to work with the group regularly;" and "I think the person doing the study should have made sure all was going well." In this study, when faced with challenges within the group related to technology or structure of the group, student frustration was apparent and understandable. As discussed previously, when the tool is not working properly, the task can be hindered which can thus result in frustration.

Technology in this study could be considered part of the structural element "domain" in the CoP framework, and when it is functioning well, it makes the CoP a "social structure that can assume responsibility for developing and sharing knowledge" (Wenger, 1998, p. 29) when it is not functioning properly it obstructs and could harm future involvement by members. As one participant in the Skype™ group specifically stated, "I think that Skype™ was the wrong medium for this project. Maybe e-conferencing would have been better. Or I think Facebook would have been better. That way everyone could have talked on their schedule, too."

Theoretical Implications

All elements of the CoP, domain, community, and practice, were observed in the synchronous text- and video-based environments in this study, suggesting synchronous interactions support the development and sustainment of an effective community of practice. Domain, the first element of a CoP, was present in that students were all distance education graduate students studying education and interacting with other participants using a synchronous CMC. Each synchronous group meeting required rigorous planning and preparation, but once the groups were established, open communication and group cohesion began to develop, both indicators of the element of "community" within a community of practice (Gunwardena et al., 2009; Wenger, 1998). Sense of community was inferred from statements such as, "it felt like a family;" and "it helped me feel more connected." The element of "practice" was evident in the discussions with the facilitator and other participants about the dissertation process, as well as discussions about professors and courses to take.

Support for the CoP framework was garnered in this study. Facilitators were given freedom to direct the discussion of the group following introduction of the standard conversation starters. Therefore, all groups were started the same way, but the end product of each group was different. As noted in the open-ended responses, participants reported similar discussion topics (e.g., dissertation) but there were also discussions about courses and professors to take, suggesting the path of the dialogue between group members was directed by the needs of the groups. This is consistent with the framework of a CoP allowing participants to express their own needs and to address issues as they arise. No two CoP will look exactly alike (Wenger, 1998).

Implications for Practice

This study demonstrated that the use of different synchronous CMC systems did not affect feelings of loneliness or sense of community among distance education graduate students within the same university. However, the qualitative part of the study did show synchronous CMC systems could effectively promote the development of a CoP with distance education graduate students, which has within its core structure the element of community. In this study, social interactions using synchronous text- or video-based CMC systems were carried out through Facebook and Skype^{TM} software programs. The qualitative data did show a trend toward increased connectedness among community members. The synchronous communications appeared to enhance CoP, but did not necessarily impact sense of community and loneliness based on the measures used.

The results of the qualitative part of this study provide some suggestions for universities offering distance education programming to graduate students. The results of the qualitative study showed a trend that if participants would have been allowed to be engaged longer and more regularly, experienced little technical difficulty, and been provided opportunities to engage the members of the group through other CMC systems, participants would have most likely developed a solid CoP with strong bonds of community within the group. As previously presented in Chapter Two, the majority of online courses are developed using an asynchronous, text-based CMC system. Although more research on the simultaneous use of synchronous and asynchronous CMC systems for enhancing the development of community at a distance needs to be done to support preliminary findings like those found by Rockinson-Szapkiw (2009), it appears universities should consider incorporating both types of systems when conceptualizing ways to increase community among distance education graduate students.

The idea of grouping students together and leading them through a rigorous academic program – a cohort – is another possible outcome of the results of this study. Cohorts have been found to reduce dropout rates (Reynolds & Hebert, 1998), both fulfilling the need for affiliation (Radencich et al., 1998), and producing a positive impact on emotional support (Maher, 2005). Maher also found cohorts to positively influence the development of connectedness and community. Cohorts have been found to shape the learning environment of the members because of the shared experience and shared knowledge base (Maher, 2005). Since this study actually mimicked a cohort model of engagement in education, found students to be encouraged by the interactions with a facilitator, reported positive reactions to interacting with other students attending the same university, and expressed positive statements about the development of connectedness, universities may want to consider grouping distance education graduate students into cohorts immediately upon entering their respective programs.

Another implication would be to consider using cohorts for graduate students at the dissertation stage (Holmes, Birds, Seay, Smith & Wilson, 2010). As noted in the qualitative data results, many distance education graduate students are understandably anxious about the dissertation process. Cohorts have been researched and known to function much like a community (Holmes et al., 2010). And, according to the theoretical framework of socialization of graduate students, socialization in preparation for a profession takes place through interactions and experiences within the groups to which they are members (Gardner, 2010; Mendoza, 2007). Students have often reported a desire for social interaction with academic engagement (Brandes, 2006) and research has found the more socially integrated students are in the university, the more likely they are to finish (Lovitts, 2001). Not only would this be another way for universities to

successfully prepare their students for their future careers, it should increase persistence in adult learners, which translates to an increase in retention. By integrating students into a community of practice – the practice of "doing" education – distance education students may be more equipped to demonstrate best practice in their field once they graduate, and attain better developed skills for the workforce than those distance education students not involved in any CoP.

Limitations

The posttest only, control group design is considered one of the strongest experimental designs (Campbell & Stanley, 1963); however, some limitations were present in this study. Although most threats to validity were controlled for by the design, some validity concerns existed. Threats to internal validity were minimized but not completely eradicated. The selection threat was addressed through the recruitment of students all from within the department of education and through random assignment to the different CMC groups. Randomization should reduce selection threat; however, in this study, many assumptions were violated. The normality of the randomized groups was not tenable. In inferential statistics, the MANOVA is often the statistic of choice when normality issues exist. It is considered reasonably robust when there are violations of normality as long as there are at least 20 in each cell (Tabachnick & Fidell, 2007). Since there were approximately 20 in each cell, the robustness of the test was at the weaker limit.

Concerns about selection threat were initially related to computer competence. Potential participants were not aware the study was being carried out using different CMC systems, but when they were notified as to what CMC system they would be using to interact with other students, they may have chosen not to participate. Individuals who

did choose to participate given the medium to which they were assigned could have been more technically savvy than individuals who declined to respond after the initial welcome email. Thus, a volunteer bias may have influenced the group (Heiman, 2002). Additionally, participants were not screened for prior knowledge or relationship with other participants, nor were they screened for any involvement in other communities of practice related to the university or their work. Therefore, possible interaction effects were not controlled for. Interactions with familiar peers, interactions with other students outside of the CMC groups, or interactions within other communities of practice that may have provided additional support for the students, could have impacted the results. Participants could have already been well connected to the university and other students, and therefore, could have been less lonely than others who did not choose to volunteer for this study.

Additionally, gender emerged as an issue, as two-thirds of those who initially requested additional information about the study were females. The resultant sample of participants in this study was predominantly female, despite the fact that the population of students at this university is distributed equally between males and females. The vocation of education does have a predominance of females, and consistent with findings by Todd, Davis, and Cafferty (1983), women are more likely than males to volunteer for a study. According to Dollinger and Leong (1993), personality factors of volunteers include the constructs of extraversion, agreeableness, and openness from the Five-Factor model of personality assessment by McRae and Costa (1987). Participants may have been more extraverted, open to new experiences, and relational, thereby already less likely to be lonely or disconnected, which could have impacted the results.

Implementation threat was addressed through training and support to facilitators. Facilitators were contacted on a regular basis and conversation starters were sent out in advance of the week of discussion. Each week, a notice was sent out to encourage facilitators to report that the group had met and how many had attended, and to ask any questions or give feedback to the researcher. Oftentimes, facilitators would neglect to report that they had met and/or report the group attendance. In one group, due to some technical issues and geographical constraints on the part of this researcher, some technical issues for a facilitator were not addressed in a timely manner, and thus, caused some delay in one group getting started. Group members also had difficulty connecting with this particular facilitator. Later it was learned the facilitator was one of many homeowners in the path of a terrible tornado in the southeast. Once the facilitator got reorganized and attempted to connect with the group, the participants reported frustration, or chose to ignore all future emails.

Web-based survey and self-report instruments are considered limitations as they introduce the possibility of a social desirability bias in reporting (van de Mortel, 2008). It is difficult to truly assess a person's true feelings and, since the measures used had a fair amount of face validity, individuals could respond with what they believed the researcher wanted to hear. The language of the Classroom Community Scale was changed slightly to allow participants to respond to the instrument in regards to the CMC group in which they were assigned rather than the class in which they were enrolled. This could have caused some confusion when responding to some of the items on the CCS such as, "I do not feel a spirit of community;" and "I feel this course (group) results in only modest learning."

Another limitation to the study was nonresponse to the survey. Although most participants were involved in the study from beginning to end and completed the survey as requested, there were a few who did not complete the survey. Data from these individuals was not available and the results will never be known if these individuals would have responded differently than those who did complete the survey. Research on nonresponse bias suggests the reasons for nonresponse to a survey can be classified into four categories: inaccessibility, inability, carelessness, and noncompliance (Reio, 2007). Only carelessness and noncompliance are sensible causes for nonresponse in this study. Individuals who are careless and noncompliant may be individuals who are more likely to be lonely and disconnected. Finally, generalizability of results is limited to the school of education at the research university.

Implications for Future Research

Future research should take into account the noted limitations of this study. The instruments chosen for this study were not specific and sensitive enough to accurately evaluate the constructs of loneliness and community. While the de Jong Gierveld Loneliness scale may be an excellent measure for assessing loneliness in the general population, the current study required a more defined measure to target the construct of isolation, separation, alienation, or remoteness specifically related to educational pursuit, and not the state or trait of loneliness. Future research endeavors might include an analysis of the experience of distance education graduate students and their feelings related to isolation in their educational pursuit. Thus, the results from further research could direct the creation of a more defined, targeted measure to be used to assess this construct more accurately for this population.

The CCS did not adequately identify the sense of community being assessed in this study. Assessing and measuring the construct of sense of classroom community among a group of individuals who have never met, are not in the same courses, and who have limited contact through various CMC systems is a complicated task. The measure had two subscales: learning and connectedness. Although the word "course" was changed to "group" for this study, the learning subscale was specific to a classroom with statements such as, "I feel this course does not promote a desire to learn;" or "I feel like I receive timely feedback." These questions have little meaning when assessing sense of community among members of a group who are not in a course together. The connectedness subscale items included, "I feel confident that others will support me;" and "I feel members of this course depend on me." With only a few 30-minute interactions by groups in the current study, it would be very difficult for participants to definitively answer these statements.

This study demonstrated that there is a farther-reaching community within which students can connect and interact. Future research could address how best to assess community outside a typical distance education course. The multifaceted relationships students have with their typical fellow students, but also with those who are not connected through a course or a cohort but instead just another student at the same university, need to be specifically identified.

With the advent of new, more advanced CMC systems, it might be beneficial to replicate this study with other synchronous software programs with differing levels of social presence. A participant recommended another program called ooVoo for synchronous e-conferencing. The technical difficulties students expressed with the

Skype^{TM} program must be alleviated either through a different choice of CMC system or through increased technical support provided during the study.

Another level of CMC systems involves programs called 3-D virtual worlds where individuals login and create avatars, which can take on human-like characteristics. Much like gaming software, the avatars can talk, walk, and interact with other avatars within the virtual world. The user can use text to converse with others in the virtual room, or can actually use a microphone and voice to communicate. Research by Jin (2009) is showing promise that 3-D virtual worlds are an alternative to face-to-face contact, and can mimic the experience quite effortlessly. Future research should address this unique CMC and its capabilities to connect students.

Summary and Conclusions

This study sought to understand whether different synchronous CMC systems could impact feelings of loneliness and sense of community among distance education graduate students. Although the quantitative findings of the study did not produce data that suggested differences in the use of text-versus video-based CMC systems to impact these significant issues of loneliness and community facing distance education students, there appear to be adequate reasons for the lack of significance. First, the construct of social loneliness as measured by the de Jong Gieveld Loneliness Scale may not be the construct described by distance education students when they report loneliness. Distance education students' sense of loneliness appears to be educationally situated. Distance education students do not appear to be demonstrating the trait of loneliness but rather a state of loneliness more succinctly identified as isolation from other students, alienation from the university, and separation from educational relationships.

Second, the limitation on group interaction did not afford adequate time for students to engage one another in sufficient dialogue in order to get to know other members of the group, establish trust, and sense belongingness to the group. Comparable to lack of interaction time to influence development of community, the CCS is good for assessing classroom community, but does not appear to be sensitive to the type of community development found in this study where participants had different educational schedules, were enrolled in different courses, and had different degree goals.

Qualitative results were positive for showing rudimentary signs of the foundational elements necessary for community development. Participants were positive about having a facilitator who had been through the program, enjoyed interacting with other students, reported feeling connected to the university because of the study, and desired to continue interacting with those in their group after the study ended. Vygotsky's social learning theory is the foundation of this study since social relationships are essential to the development of community. The CoP framework was an excellent theoretical framework for this study given its flexibility for community development (e.g., discussions around the water cooler); its simple structure (e.g., people of same or different levels of knowledge can talk and converse about issues related to the domain of interest); and its purposeful outcome of making group members better at their chosen profession (e.g., students become better students by learning from others and ultimately become better professionals).

REFERENCES

Allen, M., Bourhis, J., Burrell, N., & Mabry, E. (2002). Comparing student satisfaction with distance education to traditional classrooms in higher education: A meta-analysis. *The American Journal of Distance Education, 16*(2), 83-97.

Allen, I. E., & Seaman, J. (2003). *Sizing the opportunity: The quality and extent of online education in the United States, 2002 and 2003*. Wellesley, MA: Sloan Consortium.

Allen, I. E., & Seaman, J. (2006). *Making the grade: Online education in the United States*. Needham, MA: Sloan Consortium.

Allen, I. E., & Seaman, J. (2007). Online nation: Five years of growth in online learning. *The Sloan Consortium surveys*. Retrieved from http://www.sloan-c.org/publications/survey/index.asp

American Association of University Professors (1998, May-June). Distance learning. *Academe.*

Amichai-Hamburger, Y., Wainapel, G., & Fox, S. (2002). On the internet no one knows I'm an introvert: Extroversion, neuroticism, and internet interactions. *CyberPsychology & Behavior, 5,* 125-128.

Anderson, T. L., & Emmers-Sommer, T. M. (2006). Predictors of relationship satisfaction in online romantic relationships. *Communication Studies, 57,* 153-172.

Andrade, M. S. (2008). Learning communities: Examining positive outcomes. *Journal of College Student Retention: Research, Theory, and Practice, 9*(1), 1-20.

Angelino, L. M., Williams, F. K., & Natvig, D. (2007). Strategies to engage online

students and reduce retention rates. *Journal of Educators Online, 4*(2), 1-14.

Astin, A. W. (1977). *Four Critical Years.* San Francisco: Jossey-Bass.

Astin, A. W. (1984). Student involvement: A developmental theory for higher education, *Journal of College Student Personnel, 25,* 297-308.

Astin, A. (1993). *What Matters in College? Four Critical Years Revisited.* San Francisco, CA: Jossey-Bass.

Bacalarski, M. C. (1996). Vygotsky's developmental theories and the adulthood of computer-mediated communication: A comparison and an illumination. *Journal of Russian and East European Psychology, 34*(1), 57-63.

Baker, J. (2010). What is a 'hybrid?' *Community College Journal, 81*(1), 41.

Baker, J. D., & Woods, R. H. (2004). Immediacy, cohesiveness, and the online classroom. *Journal of Computing in Higher Education, 15*(2), 133-151.

Bandura, A. (1977). *Social learning theory*. New York, NY: General Learning Press.

Barnhart, R. K. (1995). The *Barnhart Concise Dictionary of Etymology: The origins of American English Words*. New York, NY: Harper Collins Publishers.

Beaumont, R., Stirling, J., & Percy, A. (2009). Tutors' forum: Engaging distributed communities of practice. *Open Learning, 24*(2), 141-154.

Beauvisage, T. (2009). Computer usage in daily life. Proceedings of the 27th international conference on human factors in computing system. Boston, 575-584.

Bejerano, A. R. (2008). The genesis and evolution of online degree programs: Who are they for and what have we lost along the way? *Communication Education, 57*(3), 408-414.

Benbunan-Fich, R., Hiltz, R., & Harasim, L. (2005). The online interaction learning model: An integrated theoretical framework for learning networks. In Hiltz and

Goldman (Eds.) *Learning together online: Research on asynchronous learning networks* (pp.19-37). Mahwah, NJ: Erlbaum.

Bereiter, C. (2002). *Education and mind in the knowledge age*. Mahwah, NJ: Lawrence Erlbaum Associates.

Bereiter, C., & Scadamalia, M. (1993). *Surpassing ourselves: An inquiry into the nature and implications of expertise*. La Salle, IL: Open Court.

Berge, Z. L. (1999). Interaction in post-secondary Web-based learning. *Educational Technology, 39*(1), 5-11.

Berk, L. E., & Winsler, A. (1995). *Scaffolding children's learning: Vygotsky and early childhood education*. Washington DC: National Association for the Education of Young Children.

Bernal, J. (2010). Web 2.0 and social networking: Guidelines for creating and then implementing a strategy for Web 2.0 and social networking integration. Retrieved from http://java.sys-con.som/node/1358237

Bernard, R.M., & Amundsen, C. L. (1989). Antecedents to drop-out in distance education: Does one model fit all? *Journal of Distance Education, 4*(2), 25-46.

Bhowmick, A., Khasawneh, M. T., Bowling, S. R., Gramopadhye, A. K., & Melloy, B. J. (2007). Evaluation of alternate multimedia for web-based asynchronous learning. *International Journal of Industrial Ergonomics, 37*(7), 615-629.

Bird, J., & Morgan, C. (2003). Adults contemplating university study at a distance: Issues, themes, and concerns. *International Review of Research in Open and Distance Learning, 4*(1), 1-17.

Boshier, R., Brand, S., Dabiri, A., Fujitsuka, T., Tsai, C. Y. (2001). Virtual universities revealed: More than just a pretty interface? *Distance Education, 22*(2), 212-231.

Boulos, M. N., Taylor, A. D., Breton, A. (2005). A synchronous communication experiment within an online distance learning program: A case study. *Telemedicine and e-Health, 11*(5), 583-593.

Boyle, F., Kwon, J., Ross, C., & Simpson, O. (2010). Student-student mentoring for retention and engagement in distance education. *Open Learning, 25*(2), 115-130.

Brandes, L. (2006). Graduate student centers: Building community and involving students. *New Directions for Student Services, 115*, 85-99.

Bronack, S., Sanders, R., Cheney, A., Riedl, R., Tashner, J., & Matzen, N. (2008). Presence pedagogy: Teaching and learning in a 3D virtual immersive world. *International Journal of Teaching and Learning in Higher Education, 20*(1), 59-69.

Brown, J. S., Collins, A., & Duguid, P. (1989). Situated cognition and the culture of learning. *Educational Researcher, 18*(1), 32-42.

Browning, J. (1999). Analysis of concepts and skills acquisition differences between web-delivered and classroom-delivered undergraduate instructional technology courses. *Dissertation Abstracts International, 60,* 2456A. (ERIC Document Reproduction Service No. ADG 9938354).

Buch, K. & Spaulding, S. (2008). A longitudinal assessment of an initial cohort in a psychology learning community. *Teaching of Psychology, 35*(3), 189-193.

Campbell, D. T. & Stanley, J. C. (1963). *Experimental and quasi-experimental designs for research.* Chicago, IL: Rand McNally.

Carr, S. (2000). As distance education comes of age, the challenge is keeping the students. *The Chronicle of Higher Education, 46*(23), 39-41.

Carstensen, L. L. (1992). Social and emotional patterns in adulthood: Support for socioemotional selectivity theory. *Psychology and Aging, 7*(3), 331-338.

Charalambos, V., & C., & McIsaac, M. S. (1999). Factors influencing interaction in an online course. *American Journal of Distance Education, 13*(3), 22-36.

Charalambos, V., Michalinos, Z., & Chamberlain, R. (2004). The design of online learning communities: Critical issues. *Educational Medial International, 41*(2), 135-143.

Cheok, A., Ishii, H., Osada, J., Fernando, O. N., & Merritt, T. (2008). Interactive play and learning for children. *Advances in human-computer interaction.* doi:10/1155/2008/954013

Childress, M., & Braswell, R. (2006). Using massively multiplayer online role-playing games for online learning. *Distance Education, 27*(2), 12.

Clay, M. (1999). Development of training and support programs for distance education instructors [Electronic Version]. *Online Journal of Distance Learning Administration, 2*(3). Retrieved from http://www.westga.edu/~distance/clay23.html

Cohen, J. (1988). Statistical Power Analysis for the Behavioral Sciences (2nd Ed.). Mahwah, NJ: Lawrence Erlbaum Associates.

Cutler, R. H. (1995). Distributed presence and community in cyberspace. *Interpersonal Computing and Technology: A Journal for the 21st Century, 3*(2), 12-32. Retrieved from http://www.helsinki.fi/science/optek/1995/n2/cutler.txt

Dawson, S. (2006). A study of the relationship between student communication interaction and sense of community. *The Internet and Higher Education, 9,* 53-162.

de Jong Gierveld, J., & Van Tilburg, T. (2006). A 6-Item scale for overall, emotional, and social loneliness. *Research on Aging, 28*(5), 582-598.

De Freitas, S., & Neumann, T. (2009). The use of 'exploratory learning' for supporting immersive learning in virtual environments. *Computers and Education, 52*(2), 343-352.

DeCarlo, L. T. (1997). On the meaning and use of kurtosis. *Psychological Methods, 2*(3), 292-307. doi: 10.1037/1082-989X.2.3.292

Deft, R. L., & Lengel, R. H. (1984). Information richness: A new approach to managerial behavior and organizational design. In L. L. Cummings & B. M. Staw (Eds.), *Research in Organizational Behavior*, (pp. 191-233). Homewood, IL: JAI Press.

Derks, D., Bos, A., & Grumbkow, J. (2007). Emoticons and social interaction on the Internet: The importance of social context, *Computers in Human Behavior, 23* 842–849.

Dickey, M. D. (2004). The impact of web-logs (blogs) on student perceptions of isolation and alienation in a web-based distance-learning environment. *Open Learning, 19*(3), 279-291.

Dollinger, S. J., & Leong, F. T. L. (1993). Volunteer bias and the five-factor model. *Journal of Psychology, 127*, 29-36.

Driskell, J. E., & Radtke, P. H. (2003). The effect of gesture on speech production and comprehension. *Human Factors, 45*, 445–451.

Drouin, M., & Vartanian, L. (2010). Students' feelings of and desire for sense of community in face-to-face and online courses. *Quarterly Review of Distance Education, 11*, 147-159.

Ellis, D., Oldridge, R., & Vasconcelos, A. (2004). Community and virtual community. *Annual Review of Information Science and Technology, 38*, 145-186.

Erikson, E. (1968). *Identity: Youth and Crisis*. New York: Norton.

Falvo, D. A., & Solloway, S. (2004). Constructing community in a graduate course about teaching with technology. *TechTrends: Linking Research & Practice to Improve Learning, 48*(5), 56.

Farquharson, K. (2007). Fostering friendships amongst a group of first-year university students: The use of online learning software. *Australian Journal of Emerging Technologies and Society, 5*(1), 48-57.

Fernandes, R. (December 31, 2011). Retrieved from http://tech2.in.com/news/web-services/facebook-second-most-accessed-site-behind-google-in-the-us/268862

Gao, Q., Dai, Y., Fan, Z., & Kang, R. (2010). Understanding factors affecting perceived sociability of software. *Computers in Human Behavior, 26*, 1846-1861.

Garber, D. (2004). Growing virtual communities. *The International Review of Research in Open and Distance Learning, 5*(2), 1-7.

Gardner, S. K. (2007). "I heard it through the grapevine": Doctoral student socialization in chemistry and history. *Higher Education, 54*, 723-740.

Gardner, S. K. (2010). Faculty perspectives on doctoral student socialization in five disciplines. *International Journal of Doctoral Studies, 5*, 39.

Gardner, S. K., & Barnes, B. J. (2007). Graduate student involvement: Socialization for the professional role. *Journal of College Student Development, 48*(4), 1-19.

Garrison, D. R., & Anderson, T. (2003). E-learning in the 21st century: A framework for research and practice. London: Routledge/Falmer.

Garrison, D. R., Anderson, T., & Archer, W. (2001). Critical thinking and computer conferencing: A model and tool to access cognitive presence. *The American Journal of Distance Education, 15*(1), 7-23.

Garrison, D. R., Anderson, T., & Archer, W. (2010). The first decade of the community of inquiry framework: A retrospective. *The Internet and Higher Education, 13*(1/2), 5-9.

Garrison, D. R., & Arbaugh, J. B. (2007). Researching the Community of Inquiry framework: Review, issues and future directions. *The Internet and Higher Education, 10*(3), 157-172.

Garrison, D. R., & Cleveland-Innes, M. (2005). Facilitating cognitive presence in online learning: Interaction is not enough. *The American Journal of Distance Education, 19*(3), 133-148.

Garrison, D. R., & Vaughan, N. D. (2008). *Blended learning in higher education*. San Francisco, CA: Jossey-Bass.

Gibson, C. B., & Manuel, J. A. (2003). Building trust: Effective multicultural communication processes in virtual teams. In C. B. Gibson & S. G. Cohen, (Eds.), *Virtual Teams that Work* (pp. 59-86). San Francisco, CA: Wily & Sons.

Glassman, M. (2000). Mutual aid theory and human development: Sociability as primary. *Journal for the Theory of Social Behaviour, 30*(4), 391-413.

Glomb, N., Midenhall, T., Mason, L. L., & Salzberg, C. (2009). Reducing isolation through regional mentors and learning communities: A way to support rural learners. *Rural Special Education Quarterly, 28*(4), 31-35.

Glynn, T. J. (1981). Psychological sense of community: Measurement and application. *Human relations, 34*, 780-818.

Graham, M., & Scarborough, H., (1999). Computer mediated communication and collaborative learning in an undergraduate distance education environment. *Australian Journal of Educational Technology, 15*(1), 20-46.

Groen, J., Tworek, J., & Soos-Gonczol, M. (2008). The effective use of synchronous classes within an online graduate program: Building upon an interdependent system. *International Journal on E-learning, 7*(2), 245-263.

Grooms, (2003). Computer-mediated communication: A vehicle for learning. *The International Review of Research in Open and Distance Learning, 4*(2). Article 4.2.14. Retrieved from http://www.irrodl.org/index.pp/irrodl/article/view/148/384.

Guan, J., Tregonning, S., & Keenan, L. (2008). Social interaction and participation: Formative evaluation of online CME modules. *Journal of Continuing Education in the Health Professions, 28*(3), 172-179.

Gunawardena, C. N. (1995). Social presence theory and implications for interaction and collaborative learning in computer conferences. *International Journal of Educational Telecommunications, 1*(2/3), 147-166.

Gunawardena, C. N. (2009). A cross-cultural study of online social presence: Implications for designing virtual learning communities. Proceedings of the 23rd ICDE World Conference on Open Learning and Distance Education. Maastricht, The Netherlands.

Gunawardena, C. N., & McIsaac, M. S. (2004). Distance education. In D. H. Jonassen (Ed.), Handbook of research for educational communications and technology (2nd ed.), 355-396. Mahwah, NJ: Erlbaum.

Gunawardena, C. N., & Zittle, F. J. (1997). Social presence as a predictor of satisfaction within computer-mediated conferencing environment. *The American Journal of Distance Education, 11*(3), 8-26.

Gunawardena, C. N., Hermans, M. B., Sanchez, D., Richmond, C., Bohley, M., & Tuttle, R. (2009). A theoretical framework for building online communities of practice with social networking tools. *Educational Medial International, 46*(1), 3-16.

Hao-Chang, L. (2009). Utilizing computer-mediated communication tools for problem-based learning. *Journal of Educational Technology & Society, 12*(1), 205-213.

Hara, N., Bonk, C. J., & Angeli, C. (2000). Content analysis of online discussion in an applied educational psychology course. *Instructional Science, 28*(2), 115-152.

Hartley, S., Gill, D., Walters, K., Bryant, P., & Carter, F. (2001). Twelve tips for potential distance learners. *Medical Teacher, 23*(1), 12-15.

Heiman, G. W., (2002). *Research Methods in Psychology*. (3rd ed.). Boston & New York: Houghton Mifflin.

Hess, F. M., Schneider, M., Kelly, A. P., & Carey, K. (2009). Diplomas and dropouts: Which colleges actually graduate their students (and which don't). *American Enterprise Institute for Public Policy Research Online*. Retrieved from http://www.aei.org/paper/100019

Hill, J. R. (1997). Web-based learning environments: Guidelines for development and implementation. *Journal of Public Service and Outreach, 2*(3), 36-43.

Hill, J. R. (2002). Overcoming obstacles and creating connections: Community building in Web-based learning environments. *Journal of Computing in Higher Education, 14*(1), 67-86.

Hill, J. R., Song, L., & West, R. E. (2009). Social learning theory and Web-based learning environments: A review of research and discussion of implications. *The American Journal of Distance Education, 23*, 88-103.

Hilton III, J., Graham, C., Rich, P., & Wiley, D. (2010). Using online technologies to extend a classroom to learners at a distance. *Distance Education*, *31*(1), 77-92. doi:10.1080/01587911003725030.

Hiltz, S. R., Coppola, N., Rotter, N., Turoff, M., & Benbunan-Fich, R., (2000). Measuring the importance of collaborative learning for the effectiveness of ALN: A multi-measure, multi-method approach. *Journal of Asynchronous Learning Networks, 4*(2). Retrieved from

http://www.aln.org/publications/jaln/v4n2/v4n2_hiltz.asp

Hiltz, S. R., Johnson, K., & Turoff, M. (1986). Experiments in group decision making. *Human Communication Research, 13*(2), 225-253.

HMFH Architects, (1998). Top 10 design ideas for school of the 21st century. *American School & University*. Retrieved from

http://asumag.com/mag/university_top_design_ideas/

Holley, K. A., & Taylor, B. J. (2009). Undergraduate student socialization and learning in an online professional curriculum. *Innovative Higher Education, 33*(4), 257-269.

Holmes, B. D., Birds, K., Seay, A. D., Smith, D. B., & Wilson, K. N. (2010). Cohort learning for graduate students at the dissertation stage. *Journal of College Teaching and Learning, 7*(1), 5-11.

Hopperton, L. G. (1998). Computer conference and college education. *College Quarterly,*

    5(2). Retrieved from http://www.senecac.on.ca/quarterly/1998-vol05-num-02-

    winter/hopperton.html

Hrastinski, S. (2008). Asynchronous and synchronous e-learning. Educause Quarterly,

    31(4). Retrieved from

    www.educause.edu/EDUCAUSE+Quarterly/EDUCAUSEQuarterlyMagazineVol

    um/AsynchronousandsynchronousELea/163445

Hsu, S., & Bruce, B. C. (1998). The missing border: Pedagogical reflections from

    distance education. *Teaching Education, 10*(1), 47-54.

Hu, M. (2009). Will online chat help alleviate mood loneliness? *CyberPsychology &*

    Behavior, 12(2), 219-223.

Hughes, M., Ventura, S., & Dando, M. (2007). Assessing social presence in online

    discussion groups: A replication study. *Innovations in Education and Teaching*

    International, 44(1), 17-29.

Hutcheson, F. (1730). On the Natural Sociability of Mankind**,** In Logic, Metaphysics,

    and the Natural Sociability of Mankind, Moore, J. and Silverthorne, M. (Eds.)

    (Indianapolis: Liberty Fund, 2006). Retrieved from

    http://oll.libertyfund.org/title/1723/80693 on 2010-08-04

Jiang, J. (2008). *Exploring the relationship between the feelings of loneliness among*

    distance learners and the levels of interaction built into the online course

    (Unpublished doctoral dissertation). Indiana State University, Terre Haute, IN.

Jin, S. A. (2009). Modality effects in Second Life: The mediating role of social presence

    and the moderating role of product involvement. *CyberPsychology & Behavior,*

    12(6), 717-721.

Johnson, C. (2001). A survey of current research on online communities of practice. *Internet and Higher Education, 4*(1), 45-60.

Johnson, G. M. (2006). Synchronous and asynchronous text-based CMC in educational contexts: A review of the recent research. *TechTrends: Linking Research and Practice to Improve Learning, 50*(4), 46.

Johnson, G. M., Howell, A. J., & Code, J. R. (2005). Online discussion and college student learning: Toward a model of influence. *Technology, Pedagogy, and Education, 14*, 61-75.

Kember, D. (1989). A longitudinal-process model of drop-out from distance education. *Journal of Higher Education, 60*(3), 278-301.

Kember, D., Lai, T., Murphy, D., Siaw, I. & Yuen, K. S. (1992). Student progress in distance education: Identification of explanatory constructs. *British Journal of Educational Psychology, 62*(3), 285-298.

Kember, D., Lai, T., Murphy, D., Siaw, I., & Yuen, K. S. (1994). Student progress in distance education courses: A replication study. *Adult Education Quarterly, 45*(1), 286-301.

Keselman, H. J., Huberty, C. J., Lix, L. M., Olejnik, S., Cribbie, R. A., Donahue, B., Kowalchuk, R. K., Lowman, L. L., Petoskey, M. D., Keselman, J. C., & Levin, J. R. (1998). Statistical practices of educational researchers: An analysis of their ANOVA, MANOVA, and ANCOVA analyses. *Review of Educational Research, 68(*3), 350-386.

Kiesler, S., Siegel, J., & McGuire, T. W. (1984). Social psychological aspects of computer-mediated communication. *American Psychologist, 39,* 1123-1134.

Kirkup, G. (2002). Identity, community and distributed learning. In Lea, M., & Nicoll,

K. (Eds.). *Distributed learning: Social, cultural approaches to practice*. London: Routledge and Falmer, 182-195.

Kock, N. (2005). Media richness or media naturalness? The evolution of our biological communication apparatus and its influence on our behavior toward e-communication tools. *IEEE Transactions on Professional Communication, 48*(2), 117-130.

Kohut, H. (1984). *How does analysis cure?* Chicago: University of Chicago Press.

Koory, M. A. (2003). Differences in learning outcomes for the online and F2F versions of "An introduction to Shakespeare". *Journal of Asynchronous Learning Networks, 7*, 18-35.

Kozma, R. B. (1994). Will media influence learning? Reframing the debate. *Educational Technology, Research, and Development, 42(2),* 7-19.

Kreijns, K., Kirschner, P., Jochems, W., & van Buuren, H. (2007). Measuring perceived sociability of computer-supported collaborative learning environments. *Computers & Education, 49*(2), 176.192.

Kreijns, K., Kirschner, P. A., & Jochems, W. (2003). Identifying the pitfalls for social interaction in computer-supported collaborative learning environments: A review of the research. *Computers in Human Behavior, 19*(3), 335-353.

Lave, J. & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation.* Cambridge, UK: Cambridge University Press.

Lawthom, R. (2011). Developing learning communities: Using communities of practice within community psychology. *International Journal of Inclusive Education, 15*(1), 153-164.

Lee, R. M., & Robbins, S. B. (1995). Measuring belongingness: The Social

Connectedness and The Social Assurance Scales. *Journal of Counseling*

Psychology, 42(2), 232-241.

Leiboff, M. D. (n.d.). Designing the perfect classroom. Retrieved from

http://www.mediaineducation.com/public/108.cfm?sd=36

Liaw, S. & Huang, H. (2000). Enhancing interactivity in Web-based instruction: A

review of the literature. *Educational Technology, 39*(1), 41-51.

Lobel, M., Neubauer, M., & Swedburg, R. (2002). The eClassroom used as a teacher's

training laboratory to measure the impact of group facilitation on attending,

participation, interaction, and involvement. *International Review of Research in*

Open and Distance Learning, 3(2).

Locatis, C., Berner, E. S., Hammach, G., Smith, S., Maisiak, R., Ackerman, M. (2010).

An exploratory study of co-location as a factor in synchronous, collaborative

medical informatics distance education. *BMC Research Notes, 3*, 1-6.

Lovitts, B. E. (2001). *Leaving the ivory tower: The causes and consequences of*

departure from doctoral study. Lanham, UK: Rowman & Littlefield Publishers,

Inc.

Luppicini, R. (2007). Review of computer mediated communication research for

education. *Instructional Science, 35*, 141-185.

Maher, M. A. (2005). The evolving meaning and influence of cohort membership.

Innovative Higher Education, 30(3), 195-211.

Manzanares, M. G. (2004). *Attitudes of counseling students' use of web-based instruction*

for online and supplemental instruction in a master's degree program of study.

Unpublished doctoral dissertation, Colorado State University, Fort Collins, CO.

Marcellus, L. (2004). Are we missing anything? Pursuing research on attrition. *Canadian Journal of Nursing Research, 36*(3), 82-98.

Markel (2001). Technology and education online discussion forums: It's in the response. *Online Journal of Distance Learning Administration, 4*(2). Retrieved from http://www.westga.edu/~distance/ojdla/summer42/markel42.html

Martinez, M. (2003). High attrition rates in e-learning: Challenges, predictors, and solutions. Retrieved from www.elearningguild.com/pdf/2/071403MGT-L.pdf

McCrae, R.R., & Costa, P.T. (1987) Validation of the five-factor model of personality across instruments and observers. *Journal of Personality and Social Psychology*, *52*, 81-90.

McDonald, J. (2002). Is "as good as face-to-face" as good as it gets? *Journal of Asynchronous Learning Networks, 6*. Retrieved from http://www.sloan-c.org/publications/jaln/v6n2/v6n2_macdonald.asp

McDowell, C. (2005). *Student characteristics, on-line course characteristics, cross-cultural adaptability, classroom community, and on-line course performance* (Doctoral dissertation) Retrieved from ProQuest Dissertations & Theses database. (Publication No. AAT 3356578)

McKenna, K. Y., Green, A.S., & Gleason, M. E. (2002). Relationship formation on the Internet: What's the big attraction? *Journal of Social Issues, 58*, 9-31.

McMillian, D. W., & Chavis, D. M. (1986). Sense of community: A definition and theory. *Journal of Community Psychology, 14*(1), 6-23.

McPherson, M., & Nunes, M. B. (2004). The failure of a virtual social space (VSS) designed to create a learning community: Lessons learned. *British Journal of Educational Technology, 35*(3), 305-321.

Meister, J. (2002). *Pillars of e-learning success.* New York, NY: Corporate University

Xchange.

Mendoza, P. (2007). Academic capitalism and doctoral student socialization: A case

study. *Journal of Higher Education, 78*, 71-96.

Moody, J. (2004). Distance education: Why are the attrition rates so high? *The Quarterly

Review of Distance Education, 5*(3), 205-210.

Moore, M. G. (1993). Theory of transactional distance. In D. Keegan (Ed.), *Theoretical

Principles of Distance Education* (pp. 22-38). New York, NY: Routledge.

Moore, M. G. & Kearsley, G. (1996). *Distance education: A systems view*. New York:

Wadsworth.

Moore, M. G., & Kearsley, G. (2005). *Distance education: A systems view* (2nd ed.).

Belmont, CA: Wadsworth Publishing.

Morahan-Martin, J., & Schumacher, P. (2003). Loneliness and social uses of the Internet.

Computers in Human Behavior, 19, 659-671.

Nash, R. D. (2005). Course completion rates among distance learners: Identifying

possible methods to improve retention. *Online Journal of Distance Learning

Administration, 8*(4). Retrieved from

http://www.westga.edu/~distance/ojdla/winder84/nash84.htm

National Center for Educational Statistics. (2010). Participation in education: All ages.

US Department of Education, Institute of Educational Sciences. Retrieved from

http://nces.ed.gov/programs/coe/2010/section1/indicator01.asp

Nichols, M. (2010). Student perceptions of a support services and the influence of

targeted interventions on retention in distance education. *Distance Education,

31*(1), 93-114.

Northrup, P. T. (2001). Online learner's preferences for interaction. *Quarterly Review of Distance Education, 3*(2), 219-227.

O'Donnell, V. L., Tobbell, J. (2007). The transition of adult students to higher education: Legitimate peripheral participation in a community of practice. *Adult Education Quarterly, 57*(4), 312-328.

Olaniran, B. A. (2006). Applying synchronous computer-mediated communication into course design: Some considerations and practical guides. *Campus-Wide Information Systems, 23*(3), 210-220.

Ouzts, K. (2006). Sense of community in online courses. *Quarterly Review of Distance Education, 7*(3), 285.

Owens, J., Hardcastle, L., & Richardson, B. (2009). Learning from a distance: The experience of remote students. *Journal of Distance Education, 23*(3), 53-74.

Palloff, R. M., & Pratt, K. (1999). *Building learning communities in cyberspace*. San Francisco: Jossey-Bass.

Palloff, R. M., & Pratt, K. (2005). *Collaborating online: Learning together in community*. San Francisco: Jossey-Bass.

Park, J.H., & Choi, H. J. (2009). Factors influencing adult learners' decision to drop out or persist in online learning. *Educational Technology & Society, 12*(4), 207-217.

Parten, M. B. (1932). Social participation among preschool children. *Journal of Abnormal and Social Psychology, 27,* 243-269.

Pena, J., Walther, J. B., & Hancock, J. T. (2007). Effects of geographic distribution on dominance perception in computer-mediated groups. *Communication Research, 34,* 313-331.

Phipps, R. A., & Merisotis, J. P. (1999). What's the difference? A review of contemporary research on the effectiveness of distance learning in higher education. Institute for Higher Education Policy. Retrieved from www.ihep.org/Publications/publications-detail.cfm?id=88

Polin, L. G. (2003). Learning in dialogue with a practicing community. In Duffy & Kirkley (Eds.) *Learner Centered Theory and Practice in Distance Education: Cases from Higher Education*. Mahwah, NJ: Lawrence Erlbaum Associates.

Radencich, M. C., Thompson, T., Anderson, N. A., Oropallo, K., Fleege, P., Harrison, M., & Hanley, P. (1998). The culture of cohorts: Preservice teacher education teams at a southeastern university in the United States. *Journal of Education for Teaching*, *24,* 109–127.

Ramirez, A., Zhang, S., McGrew, C., & Lin, S. (2007). Relational communication in computer-mediated interaction revisited: A comparison of participant-observer perspectives. *Communication Monographs, 74,* 492-516.

Reio, T. G. (2007). Survey nonresponse bias in social science research. *Adult Education & Human Resource Development, 21*(1/2), 48.

Reynolds, R., & Brannick, M. T. (2009). Effect of communication media on developmental relationships: Self-reported and observed behaviors. *Computers in Human Behavior, 25*(1), 233-243. doi: 10.1016/j.chb.2008.09.004

Reynolds, K. C., & Hebert, F. T. (1998). Learning achievements of students in cohort groups. *The Journal of Continuing Higher Education*, *46,* 34–42.

Riel, M., & Sparks, P. (2009). Collaborative knowledge building: Blending in-class and online learning formats. *Distance Learning, 6*(3), 7-13. Retrieved from ProQuest Education Journals. (Document ID: 1903519891).

Rockinson-Szapkiw, A. J. (2009). The impact of asynchronous and synchronous instruction and discussion on cognitive presence, social presence, teaching presence, and learning. (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses database.

Rockinson-Szapkiw, A. J., & Walker, V. L. (2009). Web 2.0 technologies: Facilitating interaction in an online human services counseling skills course. *Journal of Technology in Human Services, 27*, 175-193.

Rook, K. S. (1987). Social support versus companionship: Effects on life stress, loneliness, and evaluation by others. *Journal of Personality and Social Psychology, 52,* 1132-1147.

Rourke, L., Anderson, T., Garrison, D. R., & Archer, W. (1999). Assessing social presence in asynchronous, text-based computer conferencing. *Journal of Distance Education, 14(3),* 50-71.

Rovai, A. (2002a). Sense of community, perceived cognitive learning, and persistence in asynchronous learning networks. *Internet and Higher Education, 5,* 319-332.

Rovai, A. (2002b). Development of an instrument to measure classroom community. *The Internet and Higher Education, 5*(3), 197-211.

Rovai, A. (2002c). Building sense of community at a distance. *The International Review of Research in Open and Distance Learning, 3*(1). Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/79/152

Rovai, A. (2003). In search of higher persistence rates in distance education online programs, *The Internet and Higher Education, 6*(1), 1-16.

Rovai, A. P., Baker, J. D., & Cox, W. F. (2008). How Christianly is Christian distance higher education? *Christian Higher Education, 7*(1), 1-22.

Rovai, A., & Jordan, H. M. (2004). Blended learning and sense of community: A comparative analysis with traditional and fully online graduate courses. *International Review of Research in Open and Distance Learning, 5*(2), 13-14.

Rovai, A., Wighting, M. (2005). Feelings of alienation and community among higher education students in a virtual classroom. *Internet and Higher Education, 8*, 97-110.

Rovai, A. P., Wighting, M. J., & Lucking, R. (2004). The Classroom and School Community Inventory: Development, refinement, and validation of a self-report measure for educational research. *The Internet and Higher Education, 7*(4), 263-280.

Rybarczyk, B. J. (2007). Tools of engagement: Using case studies in synchronous distance-learning environments. *Journal of College Science Teaching, 6,* 31-37.

Saettler, P. A. (1968). *A history of instructional technology*. New York: McGraw-Hill.

Sanders, R., Bronack, S., Cheney, A., Tashner, J., Riedl, D., & Gilman, R. (2007). Education in the zone: Dynamic learning communities in a 3D virtual world. *IADIS International Conference on Web Based Communities,* 298-302.

Schuhmann, R. A., & Skopek, T. A. (2009). A blended learning model in a graduate public administration program. *The Quarterly Review of Distance Education, 10*(2), 219-232.

Shankar, T. R., VanKleek, M., Vincenti, A., & Smith, B. K. (2000). Fugue: A computer mediated conversational system that supports turn negotiation. Proceedings of the Hawai'i International Conference on System Sciences, Maui, Hawaii.

Shea, P. J., Li, C. S., & Pickett, A. (2006). A study of teaching presence and student sense of learning community in fully online and Web-based college courses. *The Internet and Higher Education, 9*, 175-190.

Shea, P. J., Pickett, A. M., & Pelz, W. E. (2003). A follow-up investigation of "teaching presence" in the SUNY Learning Network. *Journal of Asynchronous Learning Networks, 7*(2), 61-80. Retrieved from http://www.sloan-c.org/publications/jaln/

Sher, A. (2004). *Assessing the relationships of student-instructor and student-student interaction with student learning and satisfaction in Web-based distance learning programs.* (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses database (Publication No. AAT 3126415)

Sheeks, M. S., & Birchmeier, Z. P. (2007). Shyness, sociability, and the use of the computer-mediated communication in relationship development. *CyberPsychology & Behavior, 10*(1), 64-70.

Sherblom, J. C. (2010). The computer-mediated communication (CMC) classroom: A challenge of medium, presence, interaction, identity, and relationship. *Communication Education, 59*(4), 497-523.

Short, J., Williams, E., & Christie, B. (1976). The social psychology of telecommunications. New York: Wiley.

Simpson, O. (2004). The impact on retention of interventions to support distance learning students. *Open Learning, 19*(1), 79-95.

Simpson, O. (2008). Motivating learners in open and distance learning: Do we need a new theory of learner support? *Open Learning, 23*(3), 159-170.

Slagert van Tryon, P. J. & Bishop, M. J. (2006). Identifying "e-mmediacy" strategies for Web-based instruction: A Delphi study. *The Quarterly Review of Distance Education, 7*(1), 49-62.

Strage, A. (2008). Traditional and non-traditional college students' descriptions of the "ideal" professor and the "ideal" course and perceived strengths and limitations. *College Student Journal, 42*(1), 225-231.

Stack, S. (1998). Marriage, family and loneliness: A cross-national study. *Sociological Perspectives, 41*(2), 415-432.

Stodel, E. J., Thompson, T. L., & MacDonald, C. J. (2006). Learners' perspectives on what is missing from online learning: Interpretations through the community of inquiry framework. *International Review of Research in Open and Distance Learning, 7*(3), 1-24.

Summers, J. J., Waigandt, A., & Whittaker, T. A. (2005). A comparison of student achievement and satisfaction in an online versus a traditional face-to-face statistics class. *Innovative Higher Education, 29*(3), 233-250.

Szucs Werner, L.(2010). Analysis of online learning and community. M.S.N. dissertation, University of Nevada, Reno, United States -- Nevada. Retrieved from Dissertations & Theses: Full Text.(Publication No. AAT 1466823)

Tabachnick, B. G., & Fidell, L. S. (2007). *Using Multivariate Statistics* (5th ed.). Boston: Allyn and Bacon.

Tait, J. (2004). The tutor/facilitator role in student retention. *Open Learning, 19*(1), 97-109.

Taylor-Powell, E. & Renner, M. (2003). *Analyzing qualitative data*. University of

    Wisconsin-Extension Cooperative, Madison, WI. Retrieved from

    http://learning.uwex.edu/pdf/g3658-12.pdf

Telecompaper (2011). Skype grows FY revenues 20%, reaches 663 MLN users.

    Retrieved from http://www.telecompaper.com/news/skype-grows-fy-revenues-20-

    reaches-663-mln-users

Thompson, T. L., & MacDonald, C. J. (2005). Community building, emergent design and

    expecting the unexpected: Creating a quality elearning experience. *The Internet*

    and Higher Education, 8(3), 233-249.

Thrulow, C., Lengel, L., & Tomic, A. (2004). *Computer mediated communication.*

    Thousand Oaks, CA: SAGE Publications.

Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent

    research. *Review of Educational Research, 45*, 89-125.

Todd, M., Davis, K. E., & Cafferty, T. P. (1983). Who volunteers for adult development

    research? Research findings and practical steps to reach low volunteering groups.

    International Journal of Aging & Human Development, 18(3), 177-184.

Tolmie, A., & Boyle, J. (2000). Factors influencing the success of computer mediated

    communication (CMC) environments in university teaching: A review and case

    study. *Computers & Education, 34*, 119-140.

Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent

    research. *Review of Educational Research, 45*, 89-125.

University of Denver (2009). Online learning.

    http://ww.universitycollege.du.edu/grad/online.cfm

van de Mortel, T. F. (2008). Faking it: Social desirability response bias in self-report research. *Australian Journal of Advanced Nursing, 25*(4), 40-48.

Van der Veer, R., & Valsiner, J. (1991). *Understanding Vygotsky: A quest for synthesis.* Cambridge, MA: Blackwell.

Vaughn, N., & Garrison, D. R. (2006). Creating cognitive presence in a blended faculty development community. *The Internet and Higher Education, 8*(1), 1-12.

Venter, K. (2003). Coping with isolation: The role of culture in adult distance learners' use of surrogates. *Open Learning: The Journal of Open and Distance Learning, 18*(3), 271-287.

Vygotsky, L. S., (1976). Play and its role in the mental development of the child. In J. Bruner, A. Jolly, & K. Sylva (Eds.), *Play: Its role in development and evolution, 537-54.* New York: Basic Books.

Vygotsky, L. S., (1978). *Mind in society: The development of higher psychological processes.* Cambridge, MA: Harvard University Press.

Waits, T., & Lewis, L. (2003). Distance education at degree-granting postsecondary institutions: 2000-2001 (NCES 2003-017). Retrieved from http://news.ed.gov/pubs2003/2003017.pdf

Walther, J. B., Anderson, J. F., & Park, D. W. (1994). Interpersonal effects in computer-mediated interaction: A meta-analysis of social and antisocial communication. *Communication Research, 21*(4), 460-487.

Wang, M. (2004). Correlational analysis of student visibility and performance in online learning. *Journal of Asynchronous Learning Networks, 8*. Retrieved from http://www.sloan-c.org/publications/jaln/v8n4/index.asp

Wang, Q., & Woo, H. L. (2007). Comparing asynchronous online discussions and face-to-face discussions in a classroom setting. *British Journal of Educational Technology, 38*(2), 272-286. doi:10.1111/j.1467-8535.2006.00621.x

Watkins, B. L. (1991). A quite radical idea: The invention and elaboration of collegiate correspondence study. In B. L. Watkins & S. J. Wright (Eds.), *The foundations of American distance education: A century of collegiate correspondence study.* Dubuque, IA: Kendall/Hunt Publishing Company.

Wenger, E. (1996). Communities of practice: The social fabric of a learning organization. *The Healthcare Forum Journal, 39*(4), 20-25.

Wenger, E. (1998). *Communities of practice: Learning, meaning, and identity*. Cambridge: Cambridge University Press.

Wenger, E. (2002). Communities of practice. *Encyclopedia of the Social Sciences*, Volume 1.5, Article 5. Amsterdam: Elsevier Science.

Wenger, E. (2006). Communities of practice: A brief introduction. Retrieved from http://www.ewenger.com/theory

Wenger, E., McDermott, R., & Snyder, W. M. (2002). *Cultivating communities of practice: A guide to managing knowledge*. Cambridge, MA: Harvard Business School.

Wenger, E., & Snyder, W. M. (2000). Communities of practice: The organizational frontier. Harvard Business Review. Retrieved from http://hbr.org/2000/01/communities-of-practice-the-organizational-frontier

Williams, D., Caplan, S., & Xiong, L. (2007). Can you hear me now? The impact of voice in an online gaming community. *Human Communication Research, 33*, 427-449.

Xenos, M., Avouris, N., Stavrinoudis, D., & Margaritis, M. (2009). Introduction of synchronous peer collaboration activities in a distance learning course. *IEEE Transactions on Education, 52*(3), 305-311.

Zhao, J., Alexander, M., Perreault, H., Waldman, L., & Truell, A. (2009). Faculty and student use of technologies, user productivity, and user preference in distance education. *Journal of Education for Business*, *84*(4), 206-212.

Appendix A

Facilitator Recruitment Letter

Dear Liberty Distance Education Doctoral Candidate,

I am writing to ask your help in facilitating a research study I am conducting on distance education students. You have been asked to assist in this study because you are currently working on your dissertation in the School of Education at Liberty University.

Your name was obtained through Liberty University's education coordinator. Your participation is confidential and voluntary. The general purpose of the study is to examine the issues distance education students experience as they transition to the distance education format. It is estimated that there will be 70-100 participants in the study. I need volunteers like you to assist in carrying out the research by working as a facilitator for a group of subjects. Each facilitator will be responsible for a group of approximately 10 students. Your main responsibility will be to use predetermined conversation starters to get the participants to interact with one another. This is an important research topic and I need motivated students who are interested in helping others adjust to this medium.

Subject groups in the study will need an experienced doctoral student to assist in adjusting to the distance education format and to answer any questions they have related to coursework, etc. I will provide you with any technical training you might need to successfully navigate around the computer during the course of the study. Once the study commences, you will be asked to facilitate one 30-minute weekly session for the duration of 8 weeks. Following the 8-week period, the participants will be asked to complete a short questionnaire that should take approximately 30-45 minutes to complete. If you decide to volunteer to facilitate a group in this study, I would like to speak with you via phone or videoconference to discuss the details of the study and your role in the research.

Other than potential discomfort in answering some questions, risks will be minimal. Upon successful completion of the 8-week session and the completion of the survey, you will receive a $25 gas or restaurant card of your choice.

If you have any questions or concerns about the research, please feel free to contact me using the email below or contact Dr. Amanda Rockinson-Szapkiw (aszapkiw@liberty.edu). If you are interested in being a facilitator in this study, you may contact me directly at the email below. I greatly appreciate your help and look forward to meeting you.

Sincerely,

Lorene Heuvelman-Hutchinson
lrheuvelmanhutchinso@liberty.edu
Doctoral Candidate
Liberty University

Appendix B

Participant Recruitment Letter

Dear Liberty Distance Education Graduate Student,

I am writing to ask your help in participating in a research study I am conducting on distance education students. You have been asked to participate in this study because you are a second semester (or later) distance education student in the School of Education at Liberty University working toward your Education Specialist or Education Doctorate degree.

Your name was obtained through Liberty University's education coordinator. Your participation is confidential and voluntary and you are free to answer any, or all, questions and to withdraw your consent and/or to discontinue participation at any time without penalty. The general purpose of the study is to examine the issues distance education students experience as they transition to the distance education format. It is estimated that there will be at least 70-100 participants in the study.

If you volunteer to participate in this study, I would first ask for some brief background information through e-mail. I will provide you with any technical training you might need to successfully navigate around the computer during the course of the study. Once the study commences, you will be asked to participate in one 30-minute weekly session for the duration of 8 weeks. There will be a facilitator, who is a doctoral level graduate distance education student, available during each session to assist in answering any general questions you may have about your program of study and to assist in your adjustment to distance education. Following the 8-week period, you will be asked to complete one, short questionnaires that should take approximately 30-45 minutes to complete.

Other than potential discomfort in answering some questions, risks will be minimal. Upon successful completion of the 8-week session and the completion of the questionnaire, your name will be placed in a drawing for your choice of one of ten $25 gas or restaurant cards.

If you have any questions or concerns about the research, please feel free to contact myself or Dr. Amanda Rockinson-Szapkiw (aszapkiw@liberty.edu). I can also send you a copy of a consent form, which gives you more information on the study. If you are interested in participating in this study, you may contact me directly at the email below. I greatly appreciate your help and look forward to meeting you.

Sincerely,
Lorene Heuvelman-Hutchinson
lrheuvelmanhutchinso@liberty.edu
Doctoral Candidate
Liberty University

Appendix C

Informed Consent Form

Liberty University
Consent to Participate in a Research Study
Adult Participants

_____

Title of Study: Factors that impact success in a distance education program

Principal Investigator: Lorene R. Heuvelman-Hutchinson

_____

What are some general things you should know about research studies?
You are being asked to take part in a research study. To join the study is voluntary.
You may refuse to join, or you may withdraw your consent to be in the study, for any
reason.

Research studies are designed to obtain new knowledge that may help other people in the
future. You may not receive any direct benefit from being in the research study. There
also may be risks to being in research studies.

Deciding not to be in the study or leaving the study before it is done will not affect your
relationship with the researcher or Liberty University.

Details about this study are discussed below. It is important that you understand this
information so that you can make an informed choice about being in this research study.
You will be given a copy of this consent form. You should ask the researchers named
above, or staff members who may assist them, any questions you have about this study at
any time.

What is the purpose of this study?
The purpose of this research study is to better understand the factors that can help
distance education students achieve greater success. I want to to know what students in
the distance education courses experience and learn what issues need to be addressed by
the university to assist the student in persisting to graduation.

You are being asked to be in the study because you are a distance education graduate
student. Graduate students who are working on their advance degrees while working
part-time or full-time have unique needs and I would like to better understand those needs
and communicate them to the university.

Are there any reasons you should not be in this study?
You should not be in this study if you are not currently working part-time or full-time.
Additionally, the study it limited to those students who are working on their advance

graduate degrees and who graduated from a traditional face-to-face bachelor's degree program. Lastly, you should not be in this study if you have limited, to no, computer competency.

How long will your part in this study last?
The study will occur over an 8-week semester course.

What will happen if you take part in the study?
If you take part in this study, you will be given training in some computer mediums and then asked to interact with other students and a facilitator at least twice a week for 15-minute periods. Additionally, the comments you make during these interactions will be reviewed and analyzed to better understand your needs as a distance education student.

At the end of the study, you will be asked to complete three, short questionnaires via the computer.

What are the possible benefits from being in this study?

Research is typically designed for gaining new knowledge that benefits society, but not individual subjects. Although you may not gain much from the study, the facilitator may be able to answer some questions you have about your educational program and assist in your adjustment to distance education.

What are the possible risks or discomforts involved with being in this study?

There are few risks to the study. However, some of the questions found in the questionnaires may be personal in nature (e.g., demographic information) and you may opt out of answering those questions if desired.

How will your privacy be protected?

No participants will be identified in any report or publication about this study. Although every effort will be made to keep research records private, there may be times when federal or state law requires the disclosure of such records, including personal information. This is very unlikely, but if disclosure is ever required, Liberty University will take steps allowable by law to protect the privacy of personal information. In some cases, your information in this research study could be reviewed by representatives of the University, research sponsors, or government agencies (for example, the FDA) for purposes such as quality control or safety.
        Check the line that best matches your choice:
        _____ OK to record me during the study
        _____ Not OK to record me during the study

What if you want to stop before your part in the study is complete?
You can withdraw from this study at any time, without penalty. The investigators also have the right to stop your participation at any time.

<u>Will you receive anything for being in this study?</u>
If you participate through the entire 8-week study and complete the required questionnaires, your name will be placed in a drawing for one of ten available $25 gift card of the recipient's choice (e.g., restaurant, gas).

<u>What if you have questions about this study?</u>
You have the right to ask, and have answered, any questions you may have about this research. If you have questions, complaints, or concerns, you should contact the researcher(s) listed on the first page of this form.

<u>What if you have questions about your rights as a research subject?</u>
A committee that works to protect your rights and welfare reviews all research on human volunteers. If you have questions or concerns about your rights as a research subject, or if you would like to obtain information or offer input, you may contact the Institutional Review Board or by email to IRB_subjects@liberty.edu.

- -

Title of Study: Factors that impact success in a distance education program

Principal Investigator: Lorene R. Heuvelman-Hutchinson

<u>Subject's Agreement:</u>

I have read the information provided above. I have asked all the questions I have at this time. I voluntarily agree to participate in this research study.

_____   _____
Signature of Research Subject   Date

_____
Printed Name of Research Subject

_____   _____
Signature of Research Team Member Obtaining Consent   Date

_____
Printed Name of Research Team Member Obtaining Consent

Appendix D

Computer Skills Screening Questions for Facilitators

1. Do you own your own computer?

2. What types of programs do you use regularly?

3. Do you have a Wii/Xbox or the like? Do you play on those gaming systems?
   How often do you play? Are you involved in online gaming?

4. Do you use any synchronous programs with chat features? What programs do
   you use to chat in real-time?

5. Are you familiar with the new feature on Facebook that allows group chat?

6. Do you use any video conferencing programs?

7. How familiar are you with Skype?

8. Do you have a Skype account? How often have you used Skype in the last 6
   months?

9. Are you familiar with any 3-D computer virtual worlds?

10. Do you have an account on SecondLife?

11. Would you feel comfortable creating an avatar and learning all the aspects of a 3D
    virtual world?

12. How long do you think it would take you to familiarize yourself with a 3-D
    virtual environment?

13. If you had a choice to facilitate a group using text-based, video conferencing, or a
    3-D virtual world, which would you choose and why.

Appendix E

Conversations Starters for Facilitators

Interaction

Week

1. Welcome everyone! Introduce yourself and please tell the group about your past experience in achieving your previous degree (e.g., where did you go to school? What was your field of study).

2. What is the most positive aspect of distance education for you so far?

3. Welcome to week 2! Our last conversation was about the greatest part of distance education. Now, what has been the most challenging part of distance education? Are you having any problems with technology?

4. Welcome back everyone. We are almost to the end of week two. Tell us a little bit about your family.

5. Welcome to week 3! How are you progressing in your class(es) this semester? Are you having any problems keeping up with the assignments? What have you learned so far that was really interesting to you?

6. Last conversation we talked about how classes are going. Have you been able to juggle the requirements of the class with your responsibilities at home and at work?

7. We are at the beginning of week 4! How are classes going? Has anyone encountered anything difficult this week? Anyone have any questions about the next class you should take?

8. Can you believe you are half done with the class? How has this class, or distance education as a whole, impacted your family?

9. Week 5! How are your classes going? Are you stressed about your assignments? Can we help in any way?

10. Have you signed up for your next class? If so, what are you going to take?

11. Almost finished! How do you feel about learning at a distance?

12. How supportive is your family in your pursuit of your advanced degree?

13. What are you future educational goals? Where do you want this degree to take you?

14. Let's talk about your work. How have you been able to incorporate some of the things you have learned in your classes into your work?

15. We are at the end of this quarter. I don't want to take up too much of your time because I know you have a lot of work to do. How are you doing in your course and do you need any help technically or academically?

16. This is our last conversation. We truly appreciate the time you have taken to be apart of this study. What do you think was the best part about your participation in this group? Any other comments?

Appendix F

Personal Demographic Survey

Demographic Information

1. What is your age?

2. Are you married?

3. Do you have any children? If so, how many?

4. What year are you in your education? (Be specific – for example: I am working on my Ed. S. and this is my 2nd semester at this university).

5. Current GPA (approximately)?

6. Grade(s) in the course(s) you completed during the study?

7. Do you work part- or full-time?

8. Is your job in the field of education?

Reaction to the Study

9. What did you like about having a facilitator?

10. What did you like about meeting other students who are going through the program with you?

11. Any other comments or reactions to the study?

Appendix G

De Jong Gieveld Loneliness Scale

Please indicate for each of the 11 statements, the extent to which they apply to your situation, the way you feel now. Please, mark the appropriate answer. For example, "There is actually no one with whom I would want to share my joy or sorrow". If you experience these feelings in exactly the same way, please mark the answer "yes!"

1. There is always someone I can talk to about my day-to-day problems
        "yes!"   "yes"   "more or less"   "no"   "no!"

2. I miss having a really close friend
        "yes!"   "yes"   "more or less"   "no"   "no!"

3. I experience a general sense of emptiness
        "yes!"   "yes"   "more or less"   "no"   "no!"

4. There are plenty of people I can lean on when I have problems
        "yes!"   "yes"   "more or less"   "no"   "no!"

5. I miss the pleasure of the company of others
        "yes!"   "yes"   "more or less"   "no"   "no!"

6. I find my circle of friends and acquaintances too limited
        "yes!"   "yes"   "more or less"   "no"   "no!"

7. There are many people I can trust completely
        "yes!"   "yes"   "more or less"   "no"   "no!"

8. There are enough people I feel close to
        "yes!"   "yes"   "more or less"   "no"   "no!"

9. I miss having people around me
        "yes!"   "yes"   "more or less"   "no"   "no!"

10. I often feel rejected
        "yes!"   "yes"   "more or less"   "no"   "no!"

11. I can call on my friends whenever I need them
        "yes!"   "yes"   "more or less"   "no"   "no!"

Appendix H

Classroom Community Scale (CCS)

Developed by Alfred P. Rovai, PhD

SURVEY DIRECTIONS: Below you will see a series of statements concerning a specific course or program you are presently taking or recently completed. Read each statement carefully and place an X in the parentheses to the right of the statement that comes closest to indicate how you feel about the course or program. You may use a pencil or pen. There are no correct or incorrect responses. If you neither agree nor disagree with a statement or are uncertain, place an X in the neutral (N) area. Do not spend too much time on any one statement, but give the response that seems to describe how you feel.

Please respond to all items

1. I feel that students in this course care about each other...............(SA) (A) (N) (D) (SD)
2. I feel that I am encouraged to ask questions ....(SA) (A) (N) (D) (SD)
3. I feel connected to others in this course.......................................(SA) (A) (N) (D) (SD)
4. I feel that it is hard to get help when I have a question ....(SA) (A) (N) (D) (SD)
5. I do not feel a spirit of community...(SA) (A) (N) (D) (SD)
6. I feel that I receive timely feedback...(SA) (A) (N) (D) (SD)
7. I feel that this course is like a family ....(SA) (A) (N) (D) (SD)
8. I feel uneasy exposing gaps in my understanding ....(SA) (A) (N) (D) (SD)
9. I feel isolated in this course ....(SA) (A) (N) (D) (SD)
10. I feel reluctant to speak openly ....(SA) (A) (N) (D) (SD)
11. I trust others in this course ....(SA) (A) (N) (D) (SD)
12. I feel that this course results in only modest learning.................(SA) (A) (N) (D) (SD)
13. I feel that I can rely on others in this course ....(SA) (A) (N) (D) (SD)
14. I feel that other students do not help me learn ....(SA) (A) (N) (D) (SD)
15. I feel that members of this course depend on me.........................(SA) (A) (N) (D) (SD)
16. I feel that I am given ample opportunities to learn ....(SA) (A) (N) (D) (SD)
17. I feel uncertain about others in this course ....(SA) (A) (N) (D) (SD)
18. I feel that my educational needs are not being met.....................(SA) (A) (N) (D) (SD)
19. I feel confident that others will support me ....(SA) (A) (N) (D) (SD)
20. I feel that this course does not promote a desire to learn.............(SA) (A) (N) (D) (SD)

Appendix I

Reprint Approval for Table 1

**ELSEVIER LICENSE
TERMS AND CONDITIONS**

Mar 09, 2011

This is a License Agreement between Lorene R Heuvelman ("You") and Elsevier ("Elsevier") provided by Copyright Clearance Center ("CCC"). The license consists of your order details, the terms and conditions provided by Elsevier, and the payment terms and conditions.

All payments must be made in full to CCC. For payment instructions, please see information listed at the bottom of this form.

Supplier	Elsevier Limited The Boulevard,Langford Lane Kidlington,Oxford,OX5 1GB,UK
Registered Company Number	1982084
Customer name	Lorene R Heuvelman-Hutchinson
Customer address	1605 W Miller Dr SW Atlanta, GA 30310
License number	2624910598378
License date	Mar 09, 2011
Licensed content publisher	Elsevier
Licensed content publication	Computers in Human Behavior
Licensed content title	Effect of communication media on developmental relationships: Self-reported and observed behaviors
Licensed content author	Rosemarie Reynolds, Michael T. Brannick
Licensed content date	January 2009
Licensed content volume number	25
Licensed content issue number	1
Number of pages	11
Start Page	233
End Page	243
Type of Use	reuse in a thesis/dissertation
Portion	figures/tables/illustrations
Number of figures/tables /illustrations	1

Format	both print and electronic
Are you the author of this Elsevier article?	No
Will you be translating?	No
Order reference number	
Title of your thesis/dissertation	The Effect Different computer mediums have on distance education students' sense of community and feelings of loneliness
Expected completion date	Mar 2012
Estimated size (number of pages)	125
Elsevier VAT number	GB 494 6272 12
Permissions price	0.00 USD
VAT/Local Sales Tax	0.0 USD / 0.0 GBP
Total	0.00 USD

Terms and Conditions

INTRODUCTION

1. The publisher for this copyrighted material is Elsevier. By clicking "accept" in connection with completing this licensing transaction, you agree that the following terms and conditions apply to this transaction (along with the Billing and Payment terms and conditions established by Copyright Clearance Center, Inc. ("CCC"), at the time that you opened your Rightslink account and that are available at any time at http://myaccount.copyright.com).

GENERAL TERMS

2. Elsevier hereby grants you permission to reproduce the aforementioned material subject to the terms and conditions indicated.

3. Acknowledgement: If any part of the material to be used (for example, figures) has appeared in our publication with credit or acknowledgement to another source, permission must also be sought from that source. If such permission is not obtained then that material may not be included in your publication/copies. Suitable acknowledgement to the source must be made, either as a footnote or in a reference list at the end of your publication, as follows:

"Reprinted from Publication title, Vol /edition number, Author(s), Title of article / title of chapter, Pages No., Copyright (Year), with permission from Elsevier [OR APPLICABLE SOCIETY COPYRIGHT OWNER]." Also Lancet special credit - "Reprinted from The Lancet, Vol. number, Author(s), Title of article, Pages No., Copyright (Year), with permission from Elsevier."

4. Reproduction of this material is confined to the purpose and/or media for which