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Students' Perceptions Of Collaboration Tools In A Higher Education Online Collaborative Learning Environment

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STUDENTS' PERCEPTIONS OF COLLABORATION TOOLS IN A HIGHER EDUCATION
ONLINE COLLABORATIVE LEARNING ENVIRONMENT

by

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ABSTRACT

Higher education funding and student behavior has been changing rapidly (Dervarics, 2008). Because of this, there has been an increased focus on the use of alternative tools for course delivery. One of the emerging areas of focus has been an increased interest in the use of communication and information technologies (Curtis & Lawson, 2001). Currently, there are a wide variety of flexible delivery methods that have been used as well as their associated tools. Naturally, questions have been raised about the efficacy of these tools on the quality of student – student, student – teacher, and student – content interaction (Curtis & Lawson, 2001).

Interaction and Collaboration may be versatile tools within the online learning environment, but the main concern for instructional designers and instructors is improving student outcomes within the online learning environment. Unfortunately, there isn't much research to guide instructors and developers as to which online collaboration tools promote transformative pedagogy, and research appears non-existent indicating the preferences of students and faculty regarding specific online collaboration tools.

A host of interactive events are possible within an online learning environment. Some are viewed as essential and others may assume a more supplemental role. Participants reported that they preferred to interact with other students and their instructor using the discussion board within the online learning environment. Additionally, the participants believe that their interaction with the text was of less importance than their interaction with the instructor. Learners indicated that the discussion board was valued over all other collaboration tools available within the course. However, it is certainly possible that in other learning environments

such findings may differ. Further study is needed to determine whether the initial insights of participants reflect reasonable trends in interaction or merely an isolated instance.

This study was conducted using a mixed methods research approach. Mixed methods research allows the inclusion of issues and strategies that surround methods of data collection, methods of research, and related philosophical issues (Johnson, Onwuegbuzie & Turner, 2007). When qualitative and quantitative datasets are mixed, the datasets often provide richer insights into the phenomenon than if either qualitative or quantitative datasets alone were used. Additionally, using a mixed methods approach provides strengths that offset the weaknesses inherent in each sole approach (Creswell & Plano Clark, 2007; Jick, 1979). Rather than limiting the study to a single ideology, the research was able to utilize all possible methods to explore a research problem.

The results of this study provide guidelines for instructional designers developing instructional strategies for online environments. The importance of well-designed instruction was reinforced by this study. The components of "well-designed instruction" can span beyond stimulus-response or drill and practice activities to include a wide range of dynamic interactions using a wide range of increasingly specific tools. Such diverse interactions using the correct tools collectively comprise a dynamic learning environment encompassing one or more learning communities that can expand well beyond the restrictions of any single course selection, thereby connecting learners in unique ways.

ACKNOWLEDGMENTS

This dissertation is dedicated to my family. Frank, A'nnika and Ayianna, I'm sorry that I was so busy during the past five years. I only hope that this achievement will inspire you to reach for your full potential. Heather, as you start your journey, I pledge to support you through this journey just as you supported me.

I would also like to thank my dissertation committee for all of their hard work as well as my bosses and employees for their understanding. Finally, I would like to say thank you to The University of Central Florida for providing me the opportunity to thrive.

TABLE OF CONTENTS

LIST OF FIGURES

CHAPTER 1. INTRODUCTION

Context of the Study

Higher education funding and student behavior has been changing rapidly (Dervarics, 2008). Because of this, there has been an increased focus on the use of alternative tools for course delivery. One of the emerging areas of focus has been an increased interest in the use of communication and information technologies (Curtis & Lawson, 2001). Currently, there are a wide variety of flexible delivery methods that have been used as well as their associated tools. Naturally, questions have been raised about the efficacy of these tools on the quality of student – student, student – teacher, and student – content interaction (Curtis & Lawson, 2001).

As educational institutions grapple to meet the ever-increasing needs of learners, they are attempting to identify emerging educational models that seek to develop flexible, learning environments that provide learners with the freedom to learn according to their personal and education preferences (Dron, 2007; Kahn, 2007; Twigg, 2003). These developing educational models are becoming more attractive to higher education administrations because they demonstrate the possibility of meeting the needs of a rapidly changing learner population. Additionally, these models are scalable and can support continually rising numbers of learners without dramatically increasing costs (Anderson, Annand, & Wark, 2005; Ellis, Jarkey, Mahony, Peat & Sheely, 2007; Taylor, 2001).

Online learning environments that are inherently flexible represent a new and uncharted segment of online learning. On the one hand, synchronous online learning models, or models that require the student to participate online together with the professor and other students within the

same time frame, have often been developed with collaborative activities between students and instructors. On the other hand, asynchronous learning models inherently provide additional autonomy to the learner and instructor. The learner has the option to proceed through the course at his or her own pace and the instructor often is not bound to specific time frames. Traditionally, synchronous online learning environments have tended to include regular or occasional collaborative activities. However, an asynchronous online learning environment can be a more challenging environment for developing collaboration between learners and instructors because learners are often at different stages within the course at any given time (Anderson et al., 2005). Newly developed tools for collaboration and interaction based upon the fabric of social networking now provide a plethora of interactions which are possible both inside and outside of any online learning environment (Dalsgaard, 2006; Dron, 2006c). As the availability of these tools and options increases, instructional designers will need to identify the preferences of learners and instructors.

Background of the Study

Transformative pedagogy and other contemporary approaches to online learning have been trending towards social constructivist learning modalities (Bednar, Cunningham, Duffy, & Perry, 1991; Driscoll, 2006). Piaget (1969), arguably the first researcher attributed to studying social constructivism, argues that the learning process is active. He states that learners construct knowledge rather than acquire knowledge. His theory contends that learners build their own knowledge by interacting with other individuals instead of exploring concepts on their own. By balancing individualistic and collaborative educational exploration, one can develop and nurture

a flourishing social constructivist learning environment. Emerging technological developments within online education have helped to further develop the social constructivist environment (Daniel & Marquis, 1988).

Present day practices within instruction have been drifting away from the instructor-centered process and toward more learner-centered models. Emergent learning designs, which are often called self-paced or learner-paced approaches, have started to dictate the development of online instruction. These self-paced or learner-paced approaches have long been chided for reducing the learners' capacity to interact with individuals within the learning community (Danaher, 1994). Developing social networking technologies, like blogs, bookmarking services, wikis, and online syndication are being used to facilitate collaboration in new and useful ways, giving instructors the ability to extend the theoretical boundaries of collaboration within online learning environments. When social networking technologies are used in an asynchronous online learning context, they can cultivate new distributed student-centered approaches to learning and may allow individual learners to have more control over how they learn. Whenever restrictions are removed from the learning environment, learners have the opportunity to play a more active role in the development and management of their own learning environment and participate in networks that may extend far beyond the time and distance constraints of the course, cultivating a lifelong approach to the development of knowledge (Attwell, 2006; Downes, 2006; Tosh & Werdmuller, 2004).

There has been some concern about the amount of interactivity or collaboration that can be provided within distance learning environments. One of the main components of distance learning is interaction. Interaction has long been considered a binding component within any

successful learning environment (Moore, 1989). Researchers contend that four factors exist within fundamental distance education learning environments: information objects, scaffolds, interaction, and facilitation (Moller, Prestera, Harvey, Downs-Keller & McCausland, 2002). Interaction between learners, teachers and content is an essential part of knowledge construction as opposed to passive transmission of knowledge (Brown & King, 2000; Dobrovolny, 2006; Jonassen, 1999; Mezirow, 1997).

The development of critical thinking and self examination have been found to be vital objectives for instructors within higher education; however instructors may be unsure of how to accomplish these objectives. Mezirow (2000) and Taylor (2001) have developed the theory of transformative pedagogy, which has the potential to provide instructors with a useful theoretical perspective to help them with their instructional development. Mezirow (1991) contends that learners grow intellectually when they are asked to test or prove the assumptions within their learning material. This can be done within the online learning environment by using Web 2.0 collaboration tools. Instructors have found that online courses are changing the face of instruction but many of them feel that class discussion within an online learning environment can be sterile and informal as opposed to face-to-face discussions (McAuliffe & Lovell, 2000).

Interaction and collaboration may be versatile tools within the online learning environment, but the main concern for instructional designers and instructors is improving student outcomes within the online learning environment. In order to further understand interaction within the online learning environment, researchers have performed several studies. One of these studies found that significant relationships existed between student-instructor interaction and student satisfaction (Restauri, 2006). However, Chang (2003) compared a

learner's earlier learning experiences with the learner's preference for online interaction and found little to no correlation. Prammanee (2005) found that learners often emulated the collaboration techniques of the instructor and that the more interactive elements the course contained, the more learners tended to interact within the online learning environment. This study may show how important the instructor is to the development of interaction within an online course.

Unfortunately, there isn't much research to guide instructors and developers as to which online collaboration tools promote transformative pedagogy, and research appears non-existent indicating the preferences of students and faculty regarding specific online collaboration tools. This study will provide a valuable contribution to the body of knowledge concerning socially constructed learning environments by examining the specific collaboration tools learners prefer to use.

Statement of the Problem

Collaboration as a subset of interaction is known to be an important part of successful distance education programs (Beldarrain, 2006; Moore, 1993). Although it is not the only part of highly effective distance education programs, there is a considerable amount of evidence indicating that meaningful collaboration with other students and the instructor is important to the development of thriving learning environments (Brown, 2001; Garrison & Cleveland-Innes, 2005; Greene, 2005; Lee et al., 2006; Swan, 2002). Meaningful collaboration is important to the development of social connectedness and has been found to enhance both the learning

experience and course completion rates (Garrison, 2003; Su, Bonk, Magjuka, Liu, & Lee, 2005; Swan & Shih, 2005).

Research on the various approaches to distance education has produced many different theoretical bases for the development of collaboration within distance education. Instruction that lacks well developed collaboration opportunities can cause student isolation; too many collaborative opportunities can cause overload or frustration (Berge, 1999; Willging & Johnson, 2004). There is very little literature that discusses the perspectives students have for their collaborative experiences within learner-paced education models (Anderson et al., 2005). Anderson (2003) and Hirumi (2002) have provided frameworks describing the development of collaboration rich instructional environments. However, there has been very little research done to determine how effective specific tools are to facilitate these collaborative events. Additionally, there is not enough evidence demonstrating the value learners place on the different types of collaborative tools within the distance education framework.

Purpose of the Study

The purpose of this study was to further enhance research calling for the purposeful design of collaborative and interactive events within the distance education experience (Chang, 2006; Hirumi, 2002). Many researchers have found collaboration and interaction in general to be an important part of the success of distance learning initiatives. However, few of them have examined the preferences for collaborative tools through first-hand accounts of learners (Anderson et al., 2005; Wallace, 2003). Previous studies have mainly been focused on quantitative measures of interaction and how it impacts learning. These studies lack the rich

insights that can be developed by using in-depth interviews of learners about the specific preferences for online collaborative and interactive tools within the distance education process itself (Ho, 2005; Rovai & Barnum, 2003). This study will contribute to the previous research on collaboration and interaction within the distance education process by examining learner preferences for specific collaboration and interaction tool subsets.

The specific preferences learners have for collaborative tools within distance education environments have not been well documented within the research literature. One potential reason for this is that each distance education environment is unique and it is difficult to generalize specific findings across all institutions of learning. Additional research is needed to further define the assertions by Anderson (2005) and Hirumi (2002) that interaction is necessary and to provide empirical evidence for the specific tools to be used for facilitating collaborative and interactive events within distance education. This study will build upon the existing knowledge of distance education by specifically examining the preferences of learners in an online self-paced distance education learning environment that includes numerous collaborative and interactive events as well as instructor facilitation designed to create an engaging and meaningful learning experience. This study sought to learn what specific online collaborative tools learners value most.

Research Questions

This exploratory study sought to examine the experiences and preferences of learners in a distance education environment concerning the various collaborative tools they encounter in a self-paced online course. The following four primary research questions guided the data collection and analysis efforts:

7

1. What collaborative tools do learners use most in online courses?

2. What collaborative tools do learners value most in online courses?

3. What collaborative tools do learners in online courses identify as providing the most equivalent collaborative and interactive experience as a face-to-face course?

4. What impact do learners in online courses perceive interaction to have on the distance education learning experience?

Overview of Research Methods

Building upon previous research studies in human-human interaction in online learning environments, this mixed method study documented and explored the experiences of learners concerning the various types of interactive and collaborative events they prefer to engage in throughout the duration of their participation in a self-paced online course, which employs various levels of collaboration with peers, instructional materials, and the instructor. This mixed methods study provided a basic description of collaborative tool preferences within a distance education environment from the perspective of the learner.

This study employed a mixed methods approach to gain first-hand accounts from learners about their preferences. A convenience sample of learners enrolled in a self-paced distance education course was selected to participate in in-depth interviews to provide insights on their collaborative tool preferences and interaction experiences in an attempt to gain a deeper understanding of these tool preferences within the distance learning environment. The interviews consisted of a mix of quantitative and qualitative questions, which allowed the participants to indicate their preferences for the specific tools available to them in the distance education

experience. Rich learner perspectives have given us a broader vision of the personal experience, which provides additional clarity to the body of knowledge by developing a complete foundational guide for instructional designers and future inductive or empirical studies. The transcripts of the interviews with learners were analyzed and coded for emerging themes.

Significance of the Study

Collaboration and interaction have been stated to be very important within the online educational framework for developing meaningful learning experiences (Brewer & Klein, 2006; Lee et al., 2006). However, collaboration remains a concept that has not often been researched especially within asynchronous learning. In an attempt to add to the body of knowledge regarding the value participants place on collaborative tools, this study explored the preferences of learners concerning various collaborative tools they use during an asynchronous online class.

The findings of this study will be an important contribution to the body of empirical research in the continually expanding field of online learning. The study has strengthened and expanded the base of knowledge supporting the field and provided additional questions to be answered by future studies using similar methods.

Researchers indicate that the only way the full potential of collaboration within online learning can be achieved is by continuing to redevelop instructional design processes and procedures (Irlbeck, Kays, Jones, & Sims, 2006). This study, as well as others, has provided valuable data from students on the role of collaboration within online education. The findings of this study will be useful in the designing and sequencing of collaborative and interactive episodes within online learning.

Nature of the Study

By continuing previous research in human-human interaction within online learning environments, this mixed methods study documented and examined the preferences of adult learners for the various types of collaboration tools used within online learning environments. This mixed methods study provided descriptions of collaborative tools used within online learning environments from the perspective of the learners themselves.

This study used a mixed methods approach to gain first-hand accounts from learners about their preferences. A convenience sample of learners enrolled in an online course was selected to participate in an online demographic survey and structured interviews to share their stories of interaction experiences within the online course in an attempt to obtain a complete understanding of the learner dynamic during online collaboration and to determine their preference for specific collaboration tools. The interviews consisted of qualitative questions, which allowed the study participants the opportunity to indicate their level of engagement in the various types of interactive events within the online course as well as share first-hand accounts of their preferences for the specific tools used to facilitate these collaborative events. These in-depth learner perspectives provided a much deeper perspective of the immediate experience of the online learner, contributing additional value to the body of knowledge by providing a framework upon which future studies can develop.

CHAPTER 2. LITERATURE REVIEW

Online learning is rapidly advancing in an attempt to meet the changing needs of learners. This technological advancement can be seen in the growth in understanding and increasing use of pedagogical techniques, methods, and processes, which create conditions conducive for creativity and learning.

Because of the continued developments within the field of online collaboration, many studies have been conducted which focus on different parts of the development of the online-learning environment. The following review takes a closer look at the major theoretical foundations and current discoveries concerning the value of interactions within the online learning environment.

Theoretical Framework

Several researchers have identified and further developed the theoretical foundations in an effort to better define the various components of distance education. Even though the distance education arena has always been filled with various organizational and structural restrictions, the basic concern of theoretical development continues to move away from organizational issues toward the assumptive and transactional (Garrison, 2000). Early theorists, such as Wedemeyer (1971), Keegan (1996), and Holmberg (1989), focused on changing the format of distance education from "correspondence courses" to more specialized individual approaches. The available technology has improved to the point where structural restrictions have all but disappeared. This means that the focus has now shifted from implementation to the exploration of current theories within distance education that champion communication as the foundation for

teaching and learning interactions. These theoretical ideologies are poised to significantly

advance distance learning into a post-industrial era, which will provide more choice and

diversity. These ideologies will center on the facilitation of instruction that is determined by the

learner. The learning theories in use today are the bases for creating the research questions that

have paved the way for the discovery of more literature for this study and they focused on the

importance of teaching and learning transactions while trying to find approaches that are

important to learning development.

Transactional Perspective

Researchers have continually been trying to understand the nature of educational

transactions within distance-learning environments (Rovai, 2002; Saba, 2000; Stein, Wanstreet,

Calvin, Overtoom, & Wheaton (2005). Many believe that educational transactions surrounding

curriculum concepts are important to the construction of new knowledge that is both practical

and lasting. The transactional view of teaching and learning is based on the principle that,

"Information has meaning and value only when interconnections are made among facts, ideas

and experience" (Garrison & Archer, 2000, p. 7). This view states that knowledge is constructed

rather than gained. It also states that collaboration is critical to knowledge construction and for

the strengthening of new knowledge. Once learners develop communication networks between

themselves, other learners, and instructors, various paths for critical inquiry and dialogue are

developed. The future of transactional learning will recognize learner metacognition and self

efficacy. Learners will have to think about how they think and adjust their environment to suit

their specific way of learning. By combining individual learning contexts belonging to all

12

members of a given learning community, instructors and developers acknowledge each learner's own level of metacognition as a substantial contribution to the overall learning experience. This acknowledgement of learner metacognition by instructors and developers can provide significant, ongoing contributions to the development of learning applications within online education.

Transactional Distance vs. Transactional Control

Getting past the focused analysis of educational transactions, Michael Moore's (1986) theory of transactional distance is a very popular framework within distance education. It states that the quantity of course structure and dialogue categorizes all educational transactions. Moore's research has been independently confirmed by Saba and Shearer (1994). They went on to state that dialogue and structure are inversely interdependent. Their research showed that geographic distance is insignificant. Distance exists in all learning concepts. It can be seen in several types of communications and structured learning objects within a learning event. Furthermore, adding more course structure and reducing non-structured dialogue within learning encounters reduces the transactional distance. Moore also realized that a self-motivated learner does not need dialogue or structure. This realization shows his awareness of the attributes of the self-motivated learner and how these attributes can complicate an otherwise straightforward learning event. While Moore's theory has been heavily used in many different scenarios, its scope is too broad to be highly effective in developing rich distance learning experiences (Chen, 2000; Garrison, 2000; Gorsky & Caspi, 2005).

Jon Dron (2006c) further expanded Moore's work by developing a sub-theory that primarily focused on participant choice within the learning experience. Dron's work did not try to replace the existing theory; rather it attempted to provide clarity surrounding the control of an educational event. He stated that transactional control represents the ability of the instructor to control the dialogue within an instructional event. Conversely, learner autonomy represents the ability of the learner to control the dialogue. Therefore, transactional control will be in the hands of the instructor or learner at any particular time within a learning event based on the amount of input each group provides. Dron states that dialogue is the single factor that is shared by the instructor and learner within the learning transaction providing varying levels of control for both groups. Based on Dron's principles, it is possible to provide a learning environment that can accommodate many different types of learning styles.

Theory of Cooperative Freedom

The ability to collaborate has been shown to be very important to learning within many different contexts. But, learner preferences for varying collaboration styles are also important. Paulsen (1993) proposed the theory of cooperative freedom. His theory was much more complex that the more popular arguments of the day. These arguments claimed that self-paced education was of high quality because it had the ability to overcome issues such as time and space. The theory of cooperative freedom sees the distance learner as being motivated, self-directed and very protective of their autonomy. Paulsen realizes that asynchronous learning presents a pedagogical challenge to the development of group communication. However, Paulsen feels the stakes are just too high. He states that students who choose a distance learning format do it

14

because they want freedom from constraints such as time and place. These students also want to be able to choose the type of media and content they consume as well. In order to accommodate these desires, Paulsen proposed six key freedoms. The first two are the well-known freedoms of time and space, which have historically defined distance learning. He also notes that freedom to learn at one's own pace provides the learner with the opportunity to incorporate learning into their individual schedule and learning abilities. Learners also desire the freedom to choose the types of instructional media they consume that best fits their learning style and preferences. The final two freedoms are access and curriculum freedom. The freedom of access removes barriers such as course prerequisites, high matriculation costs, and extreme technology requirements. Curriculum freedom provides learners the opportunity to choose whichever courses they want, how they take these courses, and where they take the courses. Additionally, it removes the restrictions surrounding the transfer of credits between learning institutions. Paulsen states that the ideal distance learning solution will involve these key elements of cooperation and freedom, providing the maximum amount of control afforded to learners.

Interaction Equivalency Theorem

It is widely understood that no current single distance learning medium can support the educational experience in a way that is superior to all others (Russell, 2005). Terry Anderson (2003) developed a theoretical framework to explain the mechanics of learner interactions within the context of self-paced courses in an online environment. Anderson realized that learning institutions placed high value in online education and that they desired to systematically evaluate and adjust their delivery models to accommodate the largest number of students possible while

15

supporting specific learning styles. In order to accomplish this task, Anderson proposed the "Interaction Equivalency Theorem" which states:

> Deep and meaningful formal learning is supported as long as one of the three forms of interaction (student–teacher; student-student; student-content) is at a high level. The other two may be offered at minimal levels, or even eliminated, without degrading the educational experience. High levels of more than one of these three modes will likely provide a more satisfying educational experience, though these experiences may not be as cost or time effective as less interactive learning sequences (Anderson, 2003, para. 10).

This theorem provides the base for an extendable model of community-based learning support by permitting learner-learner interaction in an affordable manner while providing high quality self-paced learning (Anderson et al., 2005). Anderson's theory provides a vehicle to redefine how instruction is developed. He shows us that any one type of interaction can be substituted for another. However, this substitution is not as straightforward as his theory suggests. All students will not interact in a meaningful way with other students because they prefer to interact with an instructor. Additionally, other students may prefer to interact with the course content or their peers rather than an instructor. The cornerstone to Anderson's theory is that each learner is different and requires their own specific mix of interaction to fit their needs. Anderson's theory provides many different outcomes and implications for the design of online instruction those learners feel is equivalent to face-to-face instruction.

The Emergence of Online Education

The impact of technology on society is hard to ignore and it continues to evolve. Educational institutions are not exempt from this evolution. The technological advances of the past quarter century have had a tremendous effect on postsecondary distance education. The World Wide Web and its associated technologies have afforded us new design and delivery approaches for learning within higher education. Learning online continues to grow and influence higher education (Williams, 2003). This is not new since online learning has continued to develop and grow since the advent of the Internet (Khan, 1997). While online education is growing, its growth has not been equal across all higher education venues. While more than 90% of public colleges and universities in the United States utilize online learning in some way, only 53% of private colleges and universities offer any type of online courses (Allen & Seaman, 2004). There is no evidence of a decline in these trends in the near future.

Online education is becoming the modality of choice for adult learners. More and more traditional-age and older adult learners are seeking flexible, online learning experiences (Allen & Seaman, 2006). There are many reasons for this trend, most notably individual learning styles and convenience. Because of this, institutions are searching for new instructional design theories and methods for delivering instruction (Williams, 2003). In an attempt to meet these expectations, institutions are looking for solutions that can provide high quality scalable learning solutions. The use of technology-based learning shows the promise of supporting flexible educational options for learners who are more self-directed (Lee & Gibson, 2003; Oladoke, 2006).

In order to retain their student base, institutions must redefine the traditional model of the manufacture and delivery of learning (Wulf, 2003, as cited in McLaughlin, 2004). Online learning provides educational institutions the opportunity to reach learners who may not be able to physically attend classes due to time or geographical restraints (Williams, 2003). Online courses aid in reaching learners who previously did not have the option of continuing their education later in life.

The preference for online learning has been recognized and is instrumental in developing new online programs as graduates demonstrate the competencies stemming from their online education.

> Online instruction using Web technologies arouses great enthusiasm among educators and students. It provides a convenient environment for academic discourse, debate, discussion, collaboration, and friendly communication for people who are separated by time and place. It facilitates the involvement of outside experts and allows mature learners to bring their own experience and expertise to the learning process. Online learning also introduces new organizational, structural, intellectual, and cultural approaches to the educational process (Heath, 1997, p. 148).

Adult learners are a crucial population for institutions with online learning institutions. They have learning needs that are often different from the traditional college-aged student (McLaughlin, 2004). Online learners are often older and have family or job requirements that restrict their time and access to the traditional learning process (Allen & Seaman, 2006). Flexible

18

access to education is often more easily provided in an online learning environment as opposed to the face-to-face setting.

<div align="center">Relationship of the Research Questions to Literature Themes</div>

This exploratory study examined the preferences for collaboration tools adult learners had within an online course to determine if they perceived equivalency among the various interactive elements. The following literature review examines the theoretical frameworks and research conducted surrounding the dynamics of interaction in online learning environments.

<div align="center">Informal Versus Formal Learning</div>

Even though there has been a tremendous amount of emphasis placed on the development of formal education initiatives, it has always been known that learning takes place in formal and informal settings. Cross (2006) argues that nearly 85% of learning happens outside of the formal educational setting. However, little attention has been paid to understanding the informal learning process (Attwell, 2006).

Many different models have been developed to differentiate formal and informal learning endeavors (Hamilton, 2006). Tusting (2003) posits four informal learning features that are commonly used to describe the level of informal learning: the setting, the degree of flexibility and planning, accreditation process and external outcome requirements, and finally the nature of the relationship between instructor and learner (p. 12).

Livingstone (2000) provides the following definition in an effort to further define the basis of informal learning,

<div align="center">19</div>

Informal learning is any activity involving the pursuit of understanding,

knowledge or skill, which occurs outside the curricula of educational institutions,

or the course or workshops offered by educational or social agencies. The basic

terms of informal learning (e.g. objectives, content, means and processes of

acquisition, duration, evaluation or outcomes, applications) are determined by the

individual and groups that choose to engage in it. Informal learning is undertaken

on one's own, either individually or collectively, without either externally imposed

criteria or the presence of an institutionally authorized instructor (p. 2).

There are many opportunities to individualize one's learning requirements within

personal and corporate settings. The use of computers and the advancement of the Internet are

some of the recent events that have provided new forms of informal learning environments

(Selwyn, Gorard, & Furlong, 2006). Educational technology and online learning in particular

have caused the acceleration of informal learning opportunities that provide individuals with the

potential to customize their learning experiences. These new online learning environments are

shifting learning experiences from the previously formal classroom to an online classroom where

formal and informal participation can take place in new and different ways (Sims & Stork, 2007).

Students are no longer restricted to only interacting with members of their class. They now have

the opportunity to access many resources, individuals and various other learning objects and use

them as secondary learning aids. These new tools can place a virtually unlimited number of

assets at the learner's fingertips. Because of this, new collaborative learning environments are

possible that were too difficult to create before (Downes, 2007). Online learners can now select

the resources they feel best fits their needs at any moment. By doing this, learners create their

own personal learning environments (PLEs) which provide them access to their own specific set of learning resources and interactions they feel are most valuable (Attwell, 2007; Wilson, Liber, Beauvoir, Milligan, Johnson, & Sharples, 2006). The makeup of a PLE and the various interactions they create can change whenever the learner feels they should. It is possible for the online learning environment to be filled with many different PLEs, which provide valuable contributions to the learning experience of the student.

This concept has significantly blurred the line between formal and informal course environments because the communication technologies supporting the course environment are becoming more interoperable. Newly emerging learning designs can accommodate individual learning styles and provide the maximum amount of control the learner desires thereby creating a formal and informal learning environment (Sims & Stork, 2007). As more and more personalized communication technologies become popular, there will be more opportunities to integrate them into the formal learning environment. Therefore, it is important to understand the dynamics of interaction in both the formal and informal learning contexts.

<div align="center">Interaction</div>

The concepts of *interactivity* and *interaction* have never been well defined constructs and are often either used interchangeably or confused when discussing the general notions of e-learning (Sims, 2000). However, many different definitions have been developed to further illuminate the construct of interaction. Bannan-Ritland (2002), in a statistical analysis of 132 studies conducted from 1995-2000 using interaction as the main variable, found 20 different types of the interaction construct. No single definition of interaction exists within the literature

<div align="center">21</div>

but many schools of thought have guided the current understanding of its nature within the online learning environment. Wagner (1994) posits that *interaction* consists of the behaviors of individuals who seek to directly influence each other and *interactivity* focuses on the specific attributes of the technology system. Sims (2000) takes it a step further by defining *interactivity* as, "those functions and/or operations made available to the learner to enable them to work with content material presented in a computer based environment" (p. 46). Palloff and Pratt (2005) show additional differences between these two concepts by defining *interaction* as communication between individuals while referring to the development of an interactive online learning environment *interactivity*. Even though much research has been done to further clarify the topic, these two terms continue to be used interchangeably within the literature. However, this review will continue to use these terms as they are described above. Therefore, this research will focus on clarifying specific aspects of online collaborative interpersonal communication tools and how equivalent they are to the face-to-face environment. To that end, additional assessment of the construct of interaction is needed.

Taxonomies

Even though it is widely known that interactions are pivotal to the success of an online learning environment, a broad subset of classifications exist within the literature attempting to explain the composition of interaction. Moore (1989) states that three types of interaction exist within the educational context: (a) between the learner and instructor, (b) among learners, and (c) between learners and the material they are trying to learn. Moore's taxonomy only defines interaction by defining the specific parts involved and doesn't attempt to include any intended

results. But Moore's communication-based framework helped to further develop interaction factors that are considered important to the quality of online education.

Many different subsets have since been developed that attempt to further define the different types of interaction that exist within the learning environment. Many of these subsets are rather broad in nature but others are very detailed in their definition of the specific parts of interaction. Juwah (2006) defines the key interaction elements within the learning cycle as conceptualization, construction, and dialogue. Jung, Choi, Lim, and Leem (2002) classify three extensive categories of interaction: academic, collaborative, and social. Many other researchers have gone much further in their classification of the elements of interaction. However, the number or scope of classifications still does not diminish the fact that active engagement is a key component of a meaningful learning experience (Anderson & Garrison, 1998).

There are some researchers who attempt to define interaction with respect to its purposes and functions rather than its consistency. Hannafin (1989) believes that interaction functions within various domains which vary from the availability of procedural control to creating different levels of cognitive processing. This belief is centered on his definition of the diverse functions of interactions, which are confirmation, pacing, inquiry, navigation, and elaboration. Instead of restricting his scope, Hannafin keeps a practical perspective of interaction while pointing out the wide range of potential benefits from the development of purposeful interaction within an educational environment.

Anderson and Garrison (1998) broadened the view of interaction by involving teacher-teacher, teacher-content, and content-content interactions. Like Hannafin, they recognize the multitude of domains that include more than just the commonly recognized two-way

interpersonal interaction. They extend the boundaries of interaction to include subsets that previously had never been discussed.

Wagner (1997) continues Moore's schema to include the results of interactions, emphasizing the metacognition of learner's educational experiences. These interactions involve learning objects and events and their effects on each other. Wagner defines the following types of interaction categorized by their intended outcomes: interaction to increase participation, develop communication, receive feedback, enhance elaboration and retention, support learner control/self-regulation, increase motivation, negotiation of understanding, discovery, exploration, clarification of understanding, and closure. Wagner calls for the further development of two main purposes for interaction: to change learners and to move them toward an action state of goal attainment. If an individual is going to be changed by interaction, there must be an element within the education environment that motivates the learner via active participation and the learning environment must be tailored to meet their needs.

Northrup (2002) studied the various forms of interaction that students felt were important within an online learning environment and investigated the types of interactions that students perceived to be important for online learning. She states that there are four primary purposes of interaction: to interact with content, to collaborate and converse, to help monitor and regulate learning, and to support performance. She performed a case study of 52 graduate students in an online masters program in instructional technology and found that learners' preferences for interaction and individual experiences centered upon meeting their individual needs. The responses she received from the learners indicated that self-paced learning along with timely feedback from the professor was the most important variable within the course.

While it is important to understand the agents and purposes of interaction, early classifications of interaction did not have a development component necessary for attaining specified development objectives. Hirumi (2002) suggests an additional framework for interaction which stresses the need for useful strategies to direct a complete set of interactions that are key to meeting specified learning outcomes. He developed a three-tiered framework for characterizing online learning interactions and sought to differentiate the relationship between basic communication-based interactions by developing yet another theoretical framework for analyzing, designing, and sequencing planned online learning interactions. Hirumi argues that Level I interactions take place within the individual learner, such as the cognitive and metacognitive processes of learning, but Level II interactions take place between the learner and outside resources. While both levels of interaction are different and commonly accepted, Hirumi's Level III interactions propose an online learning strategy that involves a purposefully developed set of Level II interactions designed and sequenced to cultivate Level I interactions. His hierarchical approach highlights the intricacy of the complete set of interactions possible in online learning contexts and illuminates how important it is to consider all the benefits of combining different interactive events into an engaging online experience.

Before the Internet was commonly used to deliver instruction, interaction and interactivity were commonly used within active learning environments (Dempsey & Van Eck, 2007). Hirumi (2006) has studied the taxonomies for classifying online learning interactions and groups such taxonomies into four categories: (a) communication, (b) purpose, (c) activity, and (d) tool-based taxonomies. It makes no difference which classification framework is selected, the underlying criteria will generally fall into one of these four of categories.

Learner-content interaction

Hirumi (2006) identifies learner-content interactions as the ones that take place when learners access learning objects that represent the subject matter that is being studied. These types of interactions are what Holmberg (1986) describes as the "internal didactic conversation" as learners "talk to themselves" about the ideas and concepts they encounter. The early distance education programs were very content-interactive in nature. Rapidly emerging new communication technologies over the past few decades have made it possible to develop other types of interactive experiences within distance education.

Learner-instructor interaction

Many individuals believe that interaction between the student and the teacher is key to a successful online learning experience (Restauri, 2006; Rovai, 2002; Sher, 2004). Learner-instructor interactions are defined as, "student or instructor initiated communications that occur before, during and immediately after instruction" (Hirumi, 2006, p. 50). The type of interactions as well as their frequency may result in a substantial increase in the workload of both instructors and learners above what is expected within the face-to-face learning environment.

Learner-learner interaction

Interactions between learners, both in the face-to-face or online contexts, are important for collaboration, idea sharing, and knowledge construction. Moore (1989) states that learner-learner interactions occur, "between one learner and another, alone or in a group setting, with or without the real-time presence of an instructor" (p. 4). Many existing asynchronous and synchronous computer-mediated communication technologies have been used to foster rich

interpersonal interactions in distance education contexts. However, the current generation of students has grown up in the digital age. Therefore, higher education must develop new and unique ways to foster online interpersonal interactions that are commensurate with the individualized needs of today's learners (Andone, Dron, Pemberton, & Boyne, 2007).

Learner-others interaction

Online learners have the ability to develop a network of individuals outside the scope of the course for relationship building and continuing dialogue. These interactions may exist within the same context as other types of course-community interactions. Learner-others interaction allows for the development of external learning networks and includes many different types of interactions, which may enable learners to acquire, interpret and apply information from many different sources (Hirumi, 2006).

Learner-interface interaction

Because of the increase in computer-based delivery systems, Hillman, Willis, and Gunawardena (1994) developed a communication-based taxonomy of interaction, which identifies how important it is to facilitate the interaction that takes place between the learners, the instructor, and the content. When this type of interaction is defined as the, "process of manipulating tools to accomplish a task" (Hillman et al., 1994, p. 34), the technology used in the online learning experience is seen as a very important part of the success of other learning encounters. This view is one that has been reinforced within the literature, stating that the interactive experience of learners depends on the experience provided the learner by the available technology (Sims, 1999, 2000; Vonderwell & Zachariah, 2005; Wang, Gould, & Fulton,

2007). The online learning environment must have an environment where learners have no barriers between them and meaningful engagement. This online learning environment must be developed with concrete interface design principles.

Learner-tool interaction

The rapid advancement of online technology has exposed learners to an increasing number of tools for use within any given online learning environment. Today, learners are not restricted to the tools within a learning management system. Instead, many new Web tools are emerging that provide learners with many different ways to accomplish prescribed learning tasks. Learner-tool interaction includes all of the experiences learners have when using an assortment of tools to complete tasks both inside and outside of the online environment (Hirumi, 2006).

Learner-environment interaction

Learner-environment interactions occur when learners work with resources outside the computer environment or visit external locations (Hirumi, 2006).

Learner-designer interaction

Hedberg and Sims (2001) argue that the designer must also be considered within the learning environment and that any interactions between the learner and the designer must be considered as well. While these interactions are indirect, they should be considered important to the overall design of an effective learning environment (Sims, 1999). Newly developed models assign additional weight to the role of the designers and call for more acceptance of this role.

These new progressive design approaches may help online learning environments reach their full potential (Irlbeck et al., 2006).

Vicarious interaction

Not all interactive events are active ones. Sutton (2000) suggests that passive or *vicarious interaction*, also exists. He states that learners vicariously interact by consuming and processing the online interactions of others without being directly involved in the conversation. In furthering the work of Fulford and Zhang (1993), Sutton established that learners who interacted vicariously read and learned from others interactions but did not contribute to the discussion. The value of vicarious interaction should not be discounted because learners may still benefit from the act of active observation and processing the interactions of others. Vicarious interaction is not an independent form of interaction but it can be very useful part of an engaging learning environment.

Approaches

Many different ways of fostering interaction exist. All of them attempt to make the learning experience better. Asynchronous text-based computer-mediated communication tools have been ubiquitous to interpersonal interaction for decades. However synchronous communication tools are increasingly becoming more popular. Those who believe in asynchronous discussion point to the ease of participation as a key feature, which allows the instructor the ability to contribute to the discussion at anytime. When participants are allowed to contribute on their own schedule, they often have the time to thoughtfully prepare a response after considering all the elements involved surrounding the topic of discussion. These discussion

contributions are traditionally text-based but are available for review by all involved learners. Synchronous discussion however is different because it requires all the participants to be involved within the same time period. The immediate feedback associated with synchronous collaboration is often noted as the key advantage over traditional asynchronous communication. Now that communication technologies are widely available at a reasonable cost, synchronous communication tools are now more widely used within the Internet community. Hines and Pearl (2004) indicate that presence and spontaneity are the key strengths of synchronous communication. While synchronous communication technologies are providing robust interactive opportunities, there are still significant technical and logistical challenges that must be considered when implementing synchronous instruction (Ng, 2007).

In an attempt to further define the research surrounding these two primary modes of interpersonal interaction, Johnson (2006) reviewed the recent research concerned with text-based synchronous and asynchronous computer-mediated communication and determined that the effectiveness of these tools should be assessed by student achievement and satisfaction on a regular basis. Her review found many studies that showed student achievement is cultivated by structured asynchronous online interactions. Johnson supports the notion that both asynchronous and synchronous formats of communication enhance the learning experience, arguing that these communication formats used in moderation can help to meet specified learning and effectively scaffold the achievement of desired learning objectives.

Threaded discussion or online discussion boards are the most common form of asynchronous communication found within the online learning environment today (West, Waddoups, Kennedy, & Graham, 2007). These discussion boards, also known as *electronic*

conferencing, provide topical discussions in the form of *threads*. Hewitt (2005) defines this format of asynchronous discussion as, "A hierarchically organized collection of notes in which all notes but one (the note that started the thread) are written as 'replies' to earlier notes" (p. 568). Once a thread has been started, participants contribute to the thread by responding to the original post as well as to follow-up posts. The discussion grows based upon the contributions of the participants.

Many studies within the literature seek to discover how threaded discussions are used within distance education contexts. Angeli, Valanides, and Bonk (2003) reviewed the effect of a threaded discussion on collaboration between pre-service teachers outside their classroom. They studied the discussion board provided for 146 undergraduate student teachers from a university in the United States who were completing a 20-hour early-field experience while also completing a required corresponding laboratory course. The purpose for the electronic conferencing component was to provide a venue for these new teachers to further discuss the challenges they experienced in the field. They found that the online discussion did not contain well-supported reasoning and consisted mostly of anecdotal experience. Their research shows the value of structure within interactive experiences and calls for future research on the development of interaction methods within learning environments.

Fung (2004) attempted to develop a framework for analyzing online discussion and participation levels within an online master's degree program in education. She analyzed the discussion threads of 60 students in a single online course and also distributed a questionnaire to the students' three other courses (*N*=212). in an attempt to determine why some students did not participate in the optional online course discussion. Receiving responses from 83 students, Fung

discovered that students' peers affected their level of participation. Students who felt that they were part of the learning community were more likely to participate than those who did not. Additionally, she discovered that time constraints and required reading prevented many students from participating.

Greene (2005) conducted a pilot study of 39 pre-service teachers and eight practicing teachers participating in a virtual field trip experience to discover the pros and cons of including both synchronous and asynchronous discussion within video case studies. The analysis showed that the participants found that the collaborative events were helpful in terms of making sense of the theories studied in class and how to practically apply them. Although these findings are rather common-sense, they show the benefit threaded discussion and other types of interpersonal communication tools bring to real world contexts.

Topper (2005) studied the dynamics of online discussion while serving as the instructor. This provided him the opportunity to provide his instructor perspective in addition to his findings. His study involved 61 graduate students enrolled in at least one of four different graduate online courses for education professionals participating in three face-to-face learning sessions during the 15-week term: once during the first week of the course, once during the middle of the term, and once during the end of the term. By using qualitative content analysis of threaded discussion postings and student surveys, Topper was able to discover the important role the instructor has in guiding course-related online discussion. His research further enforced the value purposed communication can have within the online learning environment in determining the overall value of the learner experience. His research is consistent with similar advice found within the literature (Garrison & Cleveland-Innes, 2005; Palloff & Pratt, 2005; Salmon, 2003).

It seems that no matter how well designed threaded discussions are, they inevitably cease to grow. Hewitt (2005) studied the reasons why discussions shut down. He studied one graduate course in distance education offered online from a university in Canada that involved 14 students and one instructor. The course involved a conventional Web-based threaded discussion board where the discussion was broken into five separate discussion areas throughout the duration of the 13-week course. His study explored the substance of the postings in an attempt to discover a causal link between the discussions and their demise. To do this, he surveyed the students in an attempt to discover this phenomenon and analyzed the pattern of their online activity. The findings showed that learners stop contributing to threads when they feel there is nothing more to add to the discussion or if they lose interest in the specific topic. The observations showed that the majority of the students studied did not reread postings from earlier sessions but preferred to focus on unread postings. This type of behavior is a normal part of the life of asynchronous discussion and must be taken into account when designing and facilitating discussion activities. Maintaining an active asynchronous discussion using a threaded discussion is therefore a formidable challenge.

One solution to this challenge may be to look beyond traditional discussion board tools to facilitate asynchronous discussion. Cameron and Anderson (2006) discuss the difference between Weblogs and threaded discussion tools and demonstrate the opportunities these Weblogs offer beyond current threaded discussion within contemporary learning management systems. Weblogs, or "blogs", are a relatively easy-to-use interpersonal communication tool. Blogs are learner-directed and offer learners the ability to manage the design, content and organization of their personal communication. Discussion boards and blogs each have their own strengths;

however one tool may be more appropriate than the other based on the specific learning outcome desired. Blogs are yet another communication tool that can remove the barrier of time and distance within a learning community.

Another approach to studying interaction is to explore how it assists in the development of the online learning community. Swan (2002) discovered 22 independent course design factors and correlations to learner perceptions of interaction, learning, and satisfaction from data collected in 73 courses offered via the State University of New York Learning Network. The data suggested three key factors for learner satisfaction: clarity and consistency of course design, contact with and feedback from the course instructor, and active discussion. These components were an important part of the development of the learning community and support. Wallace (2003) confirms the importance of interaction within the development of any learning community. She poses a number of questions such as the differences between collaboration and community, as well as the efficacy of the learning community with respect to learning outcomes. Hodge, Bossé, Foulconer, & Fewell (2006) show that interaction that takes place within a learning community is key to the success of distance education initiatives. They state that a level of "closeness" can be developed by learning communities where interaction is strategically promoted and call for a learning environment that establishes, "camaraderie, safety, collegiality and a feeling of belonging while reducing the sense of remoteness" (para. 31). The purposeful design of interaction and communication within the online learning environment is important to the development of community.

Composition

There are many studies within the literature that seek to gain a better understanding of the various elements that define meaningful interaction. Maor (2003) built upon the basic pedagogical, social, managerial, and technical instructor roles discovered by Berge (1995) to define the role of the instructor in establishing and maintaining a community of learners. Other researchers have studied the perspective and preferences of instructors and their preferences pointing out the factors that influence the substance and format of interaction (Chang, 2003; McIsaac, Blocher, Mahes, & Vrasidas, 2002; Monson, 2003). Orellana (2006) conducted a study of some 131 online instructors who led at least one online course within the past five years at various institutions of higher education within the United States. Using an online version of Roblyer and Wiencke's (2004) Rubric for Assessing Interactive Qualities in Distance Courses, instructor-perceived interaction levels were explored in an attempt to determine the preferred class sizes for optimal levels of interaction. The average online class size reported by participants was 22.8. Most of the instructors perceived their courses were highly interactive and the results showed that a class size of 15.9 was considered to be optimal for attaining the highest possible level of interaction. While these numbers merely represent the instructor's perspective, Orellana's study shows that there is a correlation between class size and the quality of the interaction possible. Class size is one of many factors that can influence the quality and substance of interactive events. There was no discussion surrounding the concept of minimal class sizes suitable for interaction; however it is conceivable that a critical mass must exist for reasonable levels of interaction to be realized.

Instructors' perceptions, preferences and ability to use the available technology are all key factors that influence the composition of interaction within the online learning environment. Su et al. (2005) studied 102 students from among 27 online courses within an online MBA program offered by a large mid-western university in the United States. They then conducted interviews with 26 faculty members and 10 second-year online MBA students in an attempt to further define the perceptions of both learners and instructors of the quality of the online interaction within the online coursework. Sue et al. observed that instructors understood that learner-instructor and learner-learner interactions were crucial for high quality online programs. These perceptions may further drive development of models for online course in the future. While this research did not show any responses suggesting the importance of learner-content and learner-environment interactions, it is reasonable to assume that such interactions are also key elements of the overall quality of an online learning experience. These studies show that perceptions of quality interaction vary widely.

It is also important to examine the learner perspective of key attributes of interaction within an online learning environment and many studies have done just that (Abdulla, 2006; Fulford & Zhang, 1993; Johnson, 2007; Martens, Bastiaens, & Kirschner, 2007; Rovai & Barnum, 2003). There are many one-to-one comparisons that can be drawn between the perspective of learners and instructors, but the learner perspective is important and deserves the special attention it has received within the literature.

Grooms (2000) studied the perspectives of adult distance education learners enrolled in an online doctoral leadership program in an attempt to discover the importance of interaction within the course as well as what activities might foster such interactions. She developed and

administered the Computer-Mediated Interaction Questionnaire to 105 doctoral learners in an attempt to discover the perceived value of learner-content, learner-facilitator, and learner-peer interactions. Yielding a reliability coefficient of .86, her study found interaction to be a key element for success within the online learning environment with interpersonal interaction considered more important than intrapersonal interaction. Groom's study also showed that the learners valued interaction with the instructor over interaction with other learners.

Northrup (2002) developed an instrument similar to Grooms' in an attempt to further explore interaction modalities students felt were key to success within the online learning environment. The survey she developed was based on four main interaction variables: content interaction, conversation and collaboration, intrapersonal/metacognitive, and support. The Online Learning Interaction Inventory (OLLI) is now considered very reliable with a Cronbach's alpha reliability coefficient of .95. This survey tool has a demonstrated ability to capture a preliminary view of the interactions of learners in an online learning environment, and provides a foundation for additional inquiry into learner experiences in an attempt to truly understand their viewpoints. The OLLI was used to survey 52 graduate students in an online masters program allowing learners to rate interaction components on a five point Likert scale. This particular study showed that self-paced learning coupled with timely instructor feedback was most important to learners. Both studies provided important data surrounding the preferences of learners with respect to interaction, but neither study provided a depth of insight into the substance of learners' previous experiences or an explanation of their preferences.

There are certain elements of interaction that appear to be of constant importance to learners within the online learning environment. Russo and Benson (2005) conducted a study of

student perceptions of others in online courses with respect to affective and cognitive learning outcomes. The data collected from the student survey showed a direct correlation between students' perception of instructor presence and student satisfaction. Students indicated that a responsive instructor was key to a quality online learning experience. These findings show that asynchronous interaction is preferred, but if there is a delay in response from the instructor, there is a negative effect on students' perspective of the quality of the course. A similar study conducted by Russo and Campbell (2004) showed that the following communication practices were key to the success of an online course: frequency of interaction, responsiveness, the use of non-verbal communication channels, and participants' communication style. Instructors and instructional developers must meet the challenge of developing and leading instruction that is deemed asynchronous in nature with semi-synchronous communications from the instructor without inhibiting the student's ability to learn from one another. These types of communication skills within the online learning environment involve instructor skills that are quite different from those required for face-to-face instruction (Klein, Spector, Grabowski, & Teja, 2004; Varvel, 2007).

Basic elements of the online learning experience, such as course structure, also contribute to the composition of the interaction. Stein et al. (2005) identify the wide range of factors that influence course design as well as the ability for pedagogically sound designs to have an impact on the transactional distance that is an integral part of distance education. They studied 34 postsecondary learners from three Midwestern United States universities and found that the level of satisfaction learners had with the course structure lead to greater satisfaction with the knowledge they believed they gained from the course. Their research showed that course design

and delivery techniques were an important part of delivering a positive learning experience. This study was consistent with others in showing that quality learner driven interaction contributed to overall satisfaction with the learning experience. Herrington, Reeves, and Oliver (2006) discuss the relationship between the quality of interaction in a course and the legitimacy of the learning activities. They argue that activities that simulate "real world" scenarios are more likely to compel learners to engage in and attain knowledge, skills, and attitudes commensurate with contexts beyond the scope of the course. The social aspect of these interactions is seen as an important part of the engagement within an online venue (Jones & Peachey, 2005).

The development of interaction requires the understanding of many variables ranging from design to implementation. Hirumi (2006) calls for the careful review of goals and outcomes when developing interactive events within the online environment and stresses the importance of purposefully designed interactions. He states that complex or inadequate interactions may lead to learner dissatisfaction, poor performance, or attrition. Interactions that are poorly designed can overwhelm instructors and learners and can lead to expensive revisions to the learning activities. If learners see the prescribed interactions as busywork, they may become dissatisfied and disinterested in the subject matter. However, if interactions within the course are seen to be relevant to learning outcomes, learners will be more likely to participate. While significant challenges exist in developing engaging learning experiences, they are possible to overcome. It is important to consider learner perspectives when defining the outcomes of interactive events.

Outcomes

The facilitation and realization of specific outcomes for learners is the primary goal of instruction regardless of the approach to interaction that is selected. Many different outcomes can result when purposefully designed interaction is included within the online learning environment. One initial goal may be to foster an increased level of participation within the course. Jung et al. (2002) found that adult learners perceived interaction with instructors and peers to be an important part of developing meaningful collaboration within online discussions. Vonderwell and Zachariah (2005) further examined the specific issues that influence participation and discovered the following factors affect learner participation within online interactions: technology and interface characteristics, content area experience, student roles and instructional tasks, and information overload. These findings are similar to others within the literature that advocate for well-designed online learning environments that meet the individual needs of learners (Anderson et al., 2005; Gayton, 2007; Mimirinis & Bhattacharya, 2007). If learners are expected to actively be involved in these learning environments, the design of said environments must be designed with learner preferences in mind. While it would be impractical for an online course to incorporate every single interaction type and technology, it is important to determine the best interactive approach that best promotes the attainment of the learning objectives while balancing institutional goals and available resources.

Learning outcomes that are closely aligned with learner participation must include achievement and satisfaction. Restauri (2006) continued the work of McDaniel (2003) and Roblyer and Wiencke (2003) in an attempt to explore student-instructor interaction and learn whether perceived interaction had any effect on these outcomes. She found significant

relationships between several student-instructor instruction variables and level of student achievement. Her results show that learners who actively participate in online courses are much more likely to achieve the instructional goals of the course. The reoccurring theme of learner satisfaction and achievement within the literature demonstrates the fact that all concerned parties are seeking to improve instruction in an attempt to positively influence learner outcomes (Johnson, 2006; Jung et al., 2002; Russo & Benson, 2005). As a matter of fact, the research has shown that the more satisfied learners are with course structure and self-directed learner interaction, the higher their overall satisfaction with the course tends to be (Stein et al., 2005). Learners who are happy with the outcome of an online learning experience are more likely to attempt another online learning experience. Therefore, overall learner satisfaction is an important outcome to obtain.

Many different scales for measuring achievement derived from interaction have been discovered within the literature. These scales are sound guidance for the development of successful interactive and experiential learning experiences. Roberts (2002) indicates that reflection is an important part of experiential learning and calls for leveraging interaction to foster reflection. The process of reflecting on learning experiences often causes the learner to become more deeply engaged with the subject matter as a vehicle of reinforcement of new concepts (Ellis, 2001). Lim (2004) calls for the creation of stimulating learning environments that develop increased retention levels and greater metacognitive skills. This presents a challenge for designers and instructors to identify the best combination of methods, activities, and materials to stimulate learners and then use these findings when developing learning environments that support the attainment of these learning outcomes. As content delivery

technologies continue to evolve, it is important to consider the principles found within the literature supporting the positive effects of interaction within online learning environments.

Transactional Perspective of Adult Learning

For hundreds of years, scholars and practitioners have attempted to fully understand the principles education. Early theories from researchers who continued the research of such prominent behaviorists as Pavlov, Thorndike, Watson, and Skinner viewed education from the behaviorist perspective. These researchers believed that learner outcomes could be improved by simply adjusting the content learners are exposed to. Early in the nineteenth century, cognitive theory became ever more dominant, calling for more research on the mental processes required for learning to take place. Piaget, Vygotsky, Miller, and Bruner were prominent scholars who focused on the learning process rather than on the behavior of the learner (Ormrod, 1999). Constructivism was developed as a product of the ongoing development and sophistication of cognitive theories as a whole. The early tenant of constructivism was that knowledge cannot have the purpose of producing representations of an independent reality but rather must be tailored to fit the context in which the learner exists (Jonassen, 1999).

Subsequently, many learning theories have surfaced over the years attempting to characterize the nature of education under the theoretical umbrella of behaviorism, cognitivism, or constructivism. Merriam and Caffarella (1999) define a theory as "a set of interrelated concepts that explain some aspect of the field in a parsimonious manner" (p. 267). The objective of any educational theory is to provide "explanations about the underlying mechanisms involved in the learning processes" (Ormrod, 1999, p. 4). Theories vary widely in their approach and often

at times appear abstract or impractical. However, the goal of any learning theory is to provide structure and order to the components of any educational process.

Regardless of the learning theory, process and content cannot be separated within the educational context. Educational processes are often diminished by curricular content. Nonetheless, well-defined and developed educational processes are the determining factors for the overall success of the educational initiative.

<center>*Transmission versus Constructivism*</center>

Garrison and Archer (2000) support their transactional perspective upon the belief that "Information has meaning and value only when interconnections are made among facts, ideas and experience" (p. 7). However, there is much debate about the type of educational processes to be developed based on this and other constructivist theories. To further understand the constructivist perspective, a historical review of the transformation of education is required.

For hundreds of years, education was based on the concept of instructors as subject matter experts who transfer their knowledge to students. Students were then assessed to verify successful knowledge transfer. This model for education extends to the beginning of recorded history and shows a very restrictive and structured type of learning process. This transmission model states that the quality and quantity of the students' knowledge depends on the delivery skills of the instructor. The key to this model is the information rather than the perspective of the student (Jonassen, 1991; Vrasidas, 2000).

Behaviorism was a commonly used theory for developing early transmission models. Those who support behaviorism suggest that learning occurs through observation (Watson,

<center>43</center>

1930). They believe that students learn as a result of positive and negative feedback following actions. Because of this, drills and quizzes are considered important because they provide instant feedback on a particular learning event. As with all transmission models, the focus of the learning event is the knowledge rather than the perspective of the learner and the context of its application.

Cognitivist theorists consider different methods for the acquisition of knowledge by considering the thought processes or "mental events" (Ormrod, 1999, p. 3) as opposed to specific behavioral outcomes. Understanding the mental processes of learners is more important to the cognitivist than the correct answer. As the learning process is further defined, designers and educators can develop learning activities that are more suited to the learning needs of students. Learners cannot apply knowledge in real-world contexts if they have not been successful in mentally processing the information.

Constructivism is radically different from previous instructivist learning theories. Within the past several decades, it has become the preferred theoretical framework within educational circles providing the framework for the development of educational events that consider the perspective and preferences of learners. Since the increase in popularity of constructivist theories, many progressive approaches to educational environments have helped to shape the current framework of constructivism. Within this review, only the perspective of the most influential theorists will be considered.

John Dewey indicated the importance of interactivity within constructivist learning environments and claimed that interaction was key to any meaningful educational experience. He argued that the element of control exists within the learning activity and should be shared by

both teacher and student (Dewey, 1938). Dewey's perception of education was as a tool to help meet societal needs at the time. He stated that progressive education should consider student needs and interest when developing educational events. Since Dewey, progressive educators have called for the active involvement by students within the learning environment. Additionally, students should be provided with the opportunity to reflect on and question the knowledge they have recently acquired (Garrison & Archer, 2000).

While Dewey was an early adopter of the concept of "reflective thinking" he did not seek to adopt a radical form of student-centeredness (Dewey, 1938). Instead, he wanted students to be actively engaged in the learning process by participating in the course activities and reflecting on newly acquired knowledge. He argued that students who are actively involved in the learning process and are provided with the opportunity to reflect on what they have learned will have much better learning outcomes as opposed to the memorization of raw data.

Like Dewey, Rogers (1969) argued that education comes from experience and can transform the knowledge base of individuals as meaning is found through experience. However, Rogers is more extreme in his view as he considers individual freedom as the most important principle to the learning experience, providing students with freedom within the learning experience. Rogers (1969) studied the facilitator's role in creating and managing the learning environment. He believed these facilitators should focus on encouraging learners to construct their own knowledge by managing scenarios relevant to the knowledge to be obtained. The contemporary research surrounding the role of the facilitator within the constructivist learning environment centers on the claims of Rogers.

The ideas of Jürgen Habermas are very important components of the theoretical framework of contemporary adult learning. Habermas proposed two important doctrines within his educational theory: knowledge make-up interests and communicative competence (Habermas, 1968). He argued that no single method or process can be used for the acquisition of all types of knowledge. Instead, learning events must be structured to meet the varying needs of the individual learners and the knowledge they must learn. Habermas built his learning theory on the value of interactive experiences in which collaboration is a "reciprocal communication process" (Garrison & Archer, 2000, p. 29). The development of engaging learning events based upon learner needs creates a solid foundation for meaningful education.

All of these learning theories attempt to improve the quality of learning. The definition of learning is a key component of any educational framework. "Learning is the process of constructing meaning from raw information and confirming knowledge" (Garrison & Archer, 2000, p. 6). Therefore the goal of any learning theory is for learners in any scenario to construct meaning, defined by Garrison & Archer (2000) as "the personal discovery of connections amongst information and facts" (p. 11).

Constructivism considers learner experiences and the practical application of knowledge as key elements to any learning activity. Constructive learning environments must be constructed to be real and mentally stimulating (Barab, Squire, & Deuber, 2000). Within the constructivist framework, the instructor's role is not that of a unilateral dispenser of knowledge but rather a facilitator who guides the learning experience by creating a setting where students can explore, collaborate, and reflect on their understanding of the intended constructs. Critical thinking processes are developed when learners have the opportunity to apply their new concepts and

skills. Garrison and Archer (2000) emphasize the value of critical thinking to the overall learning experience by stating that, "Critical thinking is essential to meaningful learning and the construction of worthwhile knowledge" (p. 14). Arguments such as these have guided contemporary educational theories for decades. Early pioneers such as Dewey (1938) maintain that all significant knowledge results from reflecting upon experience. These constructivist ideals continue to dominate learning theories supporting modern adult education.

<div align="center">*Brief Overview of Andragogy*</div>

Andragogy is simply the study of adult learning. The term was first used by Alexander Kapp in 1833 and was initially used to describe the concepts within Plato's theory of education (Smith, 2005). Malcolm Knowles promoted the term in his research and publication during the 1970s and 1980s. Knowles & Associates (1984) defines andragogy as "the art and science of helping adults learn" (p. 43) in contrast with pedagogy, which is often more focused on helping children to learn. Knowles argues that andragogy is based on five basic assumptions, including: self-directedness of adult learners (1980), increased volume and quality of adult experiences over children (1990), timing of learning activities related to developmental tasks (1990), problem centered nature of adult learning rather than subject centeredness (1980), and internal motivation for adults to learn rather than external motivation for children (1980).

Andragogy does not have a quantifiable definition, but it includes the basic findings of Knowles and others with respect to adult learning. Theories often associated with the framework of andragogy include self-directed learning theory (Brockett & Hiemstra, 1991; Brookfield, 1984; Caffarella & Caffarella, 1986; Garrison, 1992, 1997; Knowles, 1975), transformative

learning theory (Boyd & Myers, 1988; Daloz, 1999; Freire, 1970; Mezirow, 2000), critical theory (Freire, 1994; Habermas, 1968), and postmodern theory (Derrida, 1978; Lyotard, 1984, 1992). Garrison and Archer's transactional perspective is an additional application principle of andragogy that has been promulgated for years.

The concepts of andragogy have been widely used to develop contemporary online learning environments and have ultimately contributed to the quality and effectiveness of these programs (Burge, 1988). Many different theoretical frameworks can be used to develop sound online learning environments but the transactional perspective identifies the important concepts of andragogy that are most important within adult online learning environments.

Transactional Perspective Defined

Garrison and Archer (2000) argue that the transactional perspective is a "coherent theoretical framework" (p. 3) because of the various means of reflection afforded the adult learner. If the learning environment is ideal, the transactional perspective believes learners will take the responsibility for their own learning and develop critical thinking processes. As Garrison and Archer (2000) indicate, "The transactional perspective is built upon two foundational concepts – that a constructivist approach is necessary for learners to create meaning, and that collaboration is essential for creating and confirming knowledge" (p. 4). This means that critical thinking and self-motivated learning processes are an important part of the teaching and learning transaction.

The transactional perspective is a cogent theoretical framework that realizes the importance of the individual and societal perspectives of learning. It recognizes that content and

process cannot be separated. The basis for the transactional perspective is the development of constructivist and collaborative learning events. The perspective then moves on to the question of student responsibility with respect to the control of learning and finally stipulates that this responsibility should be placed upon the student but shared throughout the learning community. Therefore, individual learning is a social responsibility that considers the needs of the individual and the learning community.

The final outcome is to develop a learning environment that is characterized by the relationship between critical thinking and self-directed learning, where the learner is able to build shared meaning and understanding within the learning community. Simply gaining knowledge is not as complex or effective as a collaborative, constructivist learning experience defined by "a dynamic interaction of relationships among intentions, activities and learning outcomes" (Garrison & Archer, 2000, p. 9).

Figure 1 represents the conceptual framework of the transactional perspective, illustrating three pairs of concepts from both the cognitive and social viewpoints. It is the diverse nature of the transactional perspective that makes it comprehensive enough to address all of the internal and external factors within the online learning environment.
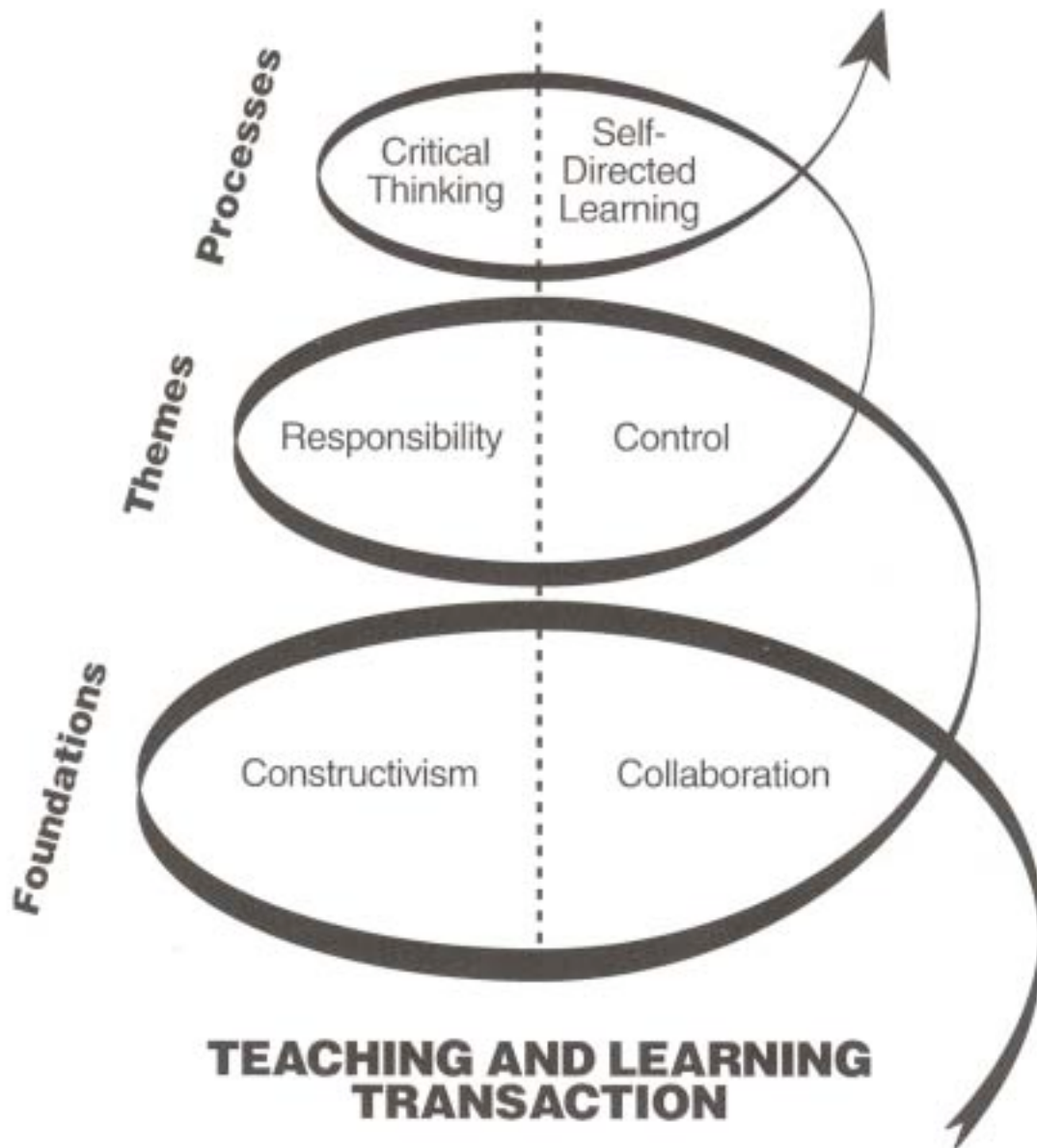
Figure 1. Conceptual framework of the transactional perspective

Reproduced by permission from Elsevier. From Garrison, D. R., & Archer, W. (2000). *A transactional perspective on teaching and learning: A framework for adult and higher* education. Amsterdam: Pergamon.

Transactional Perspective Examined

The transactional perspective may seem a bit ambiguous, but it is focused on the simple goal of developing critical thinking processes and self-directed learning opportunities for adult learners. Garrison and Archer (2000) define self-directed learning as, "an approach where learners are motivated to assume personal responsibility and collaborative control of the contextual and cognitive processes involved in constructing meaningful and worthwhile learning outcomes" (p. 93). In order for these goals to be reached, an educational environment must exist for learners to engage in various stimulating learning transactions individually and within the learning community. The use of technology to facilitate these learning transactions is not an issue as long as critical thinking and reflection are taking place in community.

Critical thinking involves a set of complex yet consistent processes that are characterized by both individual and collaborative perspectives of meaning, developed by participating in the activities within the learning community. This process involves individual learner reflection as well as learner interaction within the broader community as well as the community stimulating each member to continue to develop previously constructed knowledge.

Each learner's perspective adds depth to the community of learning. These perspectives must be recognized and encouraged. However, these individual and community approaches cannot be viewed in isolation. The transactional perspective involves the learning context and experiences of all participants involved. The critical thinking/learning cycle demonstrates the specific process that adult learners experience when exploring, identifying, and integrating knowledge within the context of a learning experience. Because this learning process occurs both

individually and within the broader learning community, learners participate in a dynamic

process of constructing knowledge that can be applied immediately. As learners begin to

construct their own knowledge through reflection and shared experiences they are able to

assimilate this new knowledge while expanding their capacity for learning (see Figure 2).
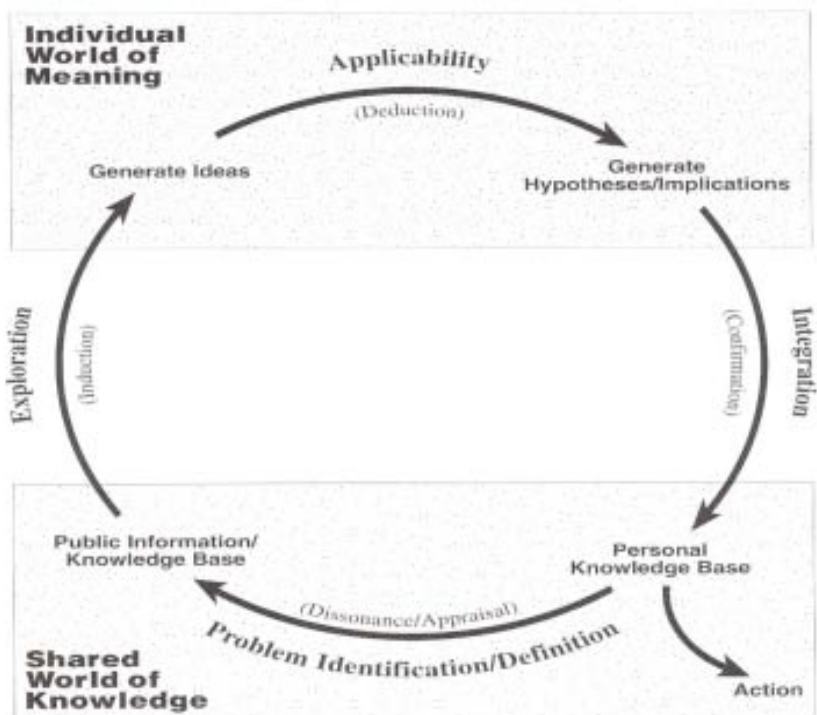

Figure 2. Critical thinking/learning cycle

Reproduced by permission from Elsevier. From Garrison, D. R., & Archer, W. (2000). *A transactional perspective on teaching and learning: A framework for adult and higher* education. Amsterdam: Pergamon.

Many research studies have been conducted to further define the perspective of

transactional learning within online learning environments (Conrad, 2002; Kanuka & Garrison,

2004; Perry & Edwards, 2005; Richardson & Newby, 2006; Tu & Corry, 2003). While removing

traditional barriers to education, online learning is demanding yet rewarding. It requires learners

to set boundaries and purposefully enter into collaborative, constructivist learning experiences. Conrad (2002) found learners have a different perspective of online learning than they do of face-to-face learning. Because of this, they have differing opinions on their preferences within the online learning environment. The online environment requires students to assume greater control of the learning experience in order to be successful (Garrison & Cleveland-Innes, 2005). Additionally, it is important for the online instructor to provide a learning environment that is conducive to the processes of teaching and learning.

Many experts argue that the objective of education is to show students how to learn so that learning can be a lifelong experience. In order to attain this objective, students must learn critical analysis and collaboration skills. The transactional perspective calls for these specific aspects to be at the center of the learning process, and focuses attention upon the real world application and integration of new knowledge, skills, and attitudes into everyday life.

Much work is yet to be done concerning the development of socially-constructed learning environments and the development of best practices of andragogy. It is quite clear that no single adult learning theory will be able to satisfy all of the complexities surrounding adult learners (Merriam, 2001). Research has shown that both cognitive and social concepts must be considered when developing meaningful learning experiences (Brown, 2000). The transactional perspective is seen as an important framework for researchers seeking to develop successful online learning environments.

Community of Inquiry (COI) Model

Online learning is not just a passing fancy. In fact, it is becoming a permanent part of higher education. Since it was introduced, online education has grown rapidly and has been significantly improved by emerging and developing learning theories coupled with newly developing technology capable of supporting new and engaging learning experiences. However, online education is not without its critics when compared to traditional face-to-face face learning. Early studies showed that online education lacked many of the elements of its face-to-face counterpart. As technology has evolved it has allowed for the development of quality online learning elements desired within the online learning environment, the quality of online learning has progressed rapidly.

In spite of this, many concerned with higher education do not agree that online education is comparable with face-to-face education and maintain a bias against online learning (Noble, 2001). However, these detractors are not considering the research which shows that online education has the potential to provide a better learning experience than traditional face-to-face approaches. The difference between online learning and other modalities is not the technology used but the teaching potential it provides when online technologies are used to develop an effective learning environment. High quality education has always included the "dynamic integration of content and context created and facilitated by a discipline expert and pedagogically competent teacher" (Garrison & Anderson, 2003, p. 4). Online learning provides educators with the potential to extend the boundaries of traditional learning by offering new and effective tools for the development of quality educational experiences. These high quality educational

experiences are the difference between online learning and its face-to-face or traditional distance education counterparts.

Communication is recognized as the most important element within high quality online learning initiatives (Brown, 2001; Ortiz-Rodriguez, Telg, Irani, Roberts, & Rhoades, 2005). Asynchronous online learning environments can support such concepts as collaboration, reflection, and higher-order thinking (Garrison, 2003). Interactions between members of the learning community are key components in the development of online learning networks. A Community of Inquiry (COI) model has been developed to further explore the various interactions among participants in a collaborative online learning experience (Anderson, Rourke, Garrison, & Archer, 2001).

Theoretical Framework

The COI model has a collaborative constructivist perspective of education where internal and external concepts are meaningfully connected. Developed using the research of educational theorists like Dewey, Rogers, and Habermas, the COI model accepts the notion that self-reflective learning is both intrapersonal and interpersonal.

The COI model presents a real application of the transactional view of education in an online learning environment. It sees education as providing the learner the ability to construct meaning from their own experiences and then refining this new meaning through collaboration with a community of learners.

In order to effectively absorb new knowledge through collaboration, learner responsibility and course control must be discussed. The learners must have the ability to take

responsibility for their own learning and the desire to control their learning experience. COI is fitting for the development of online adult learning environments where self-directed learning is essential.

COI views collaboration as a key element in the overall success of any online learning experience. Collaboration is not simply interaction. It must, "draw learners into shared experiences for the purposes of constructing and confirming meaning" (Garrison et al., 2000, p. 14). Collaborative communication within online learning is far more than social discourse. It provides a meaningful intellectual exchange that is meaningful and constructive to the learning process.

Many different roles are played by participants within the online learning experience. The online instructor plays a different and much larger role than his face-to-face counterpart (Berge, 1995, 2001; Liu, Bonk, Magjuka, Lee, & Su, 2005; Palloff & Pratt, 2005; Salmon, 2003). Garrison, Cleveland-Innes, & Fung (2004) reported that learners perceived their role in the online learning environment in a different way from their face-to-face learning experiences. The COI model takes these differences into account and provides a framework for the development of complex interactions between learners and the instructor within the online learning environment.

Community of Inquiry Model Defined

Garrison, Anderson, and Archer (2001) developed the COI model to illustrate the many different components within high quality online education. They contend that there are three key elements paramount to the development of a successful online environment: cognitive presence,

social presence, and teaching presence. Tasks such as setting the climate of the online

community, supporting discourse throughout the course, and selecting course content all occur

within the context of cognitive, social, and teaching activities. Figure 3 illustrates how the COI

model integrates these elements into the online learning environment. The COI model will be

further examined later in this review.

Community of Inquiry

Supporting
Discourse

SOCIAL
PRESENCE

COGNITIVE
PRESENCE

EDUCATIONAL
EXPERIENCE

Setting
Climate

Selecting
Content

TEACHING PRESENCE
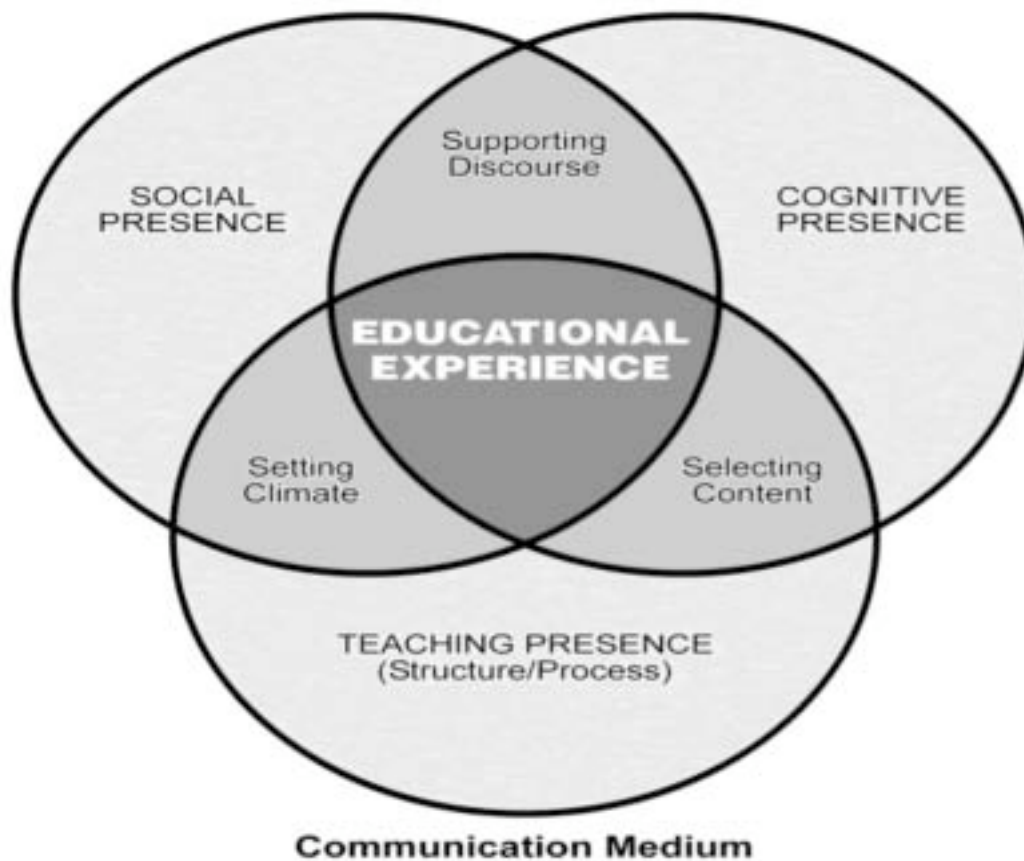(Structure/Process)

Communication Medium

Figure 3. Community of inquiry

(Reproduced by permission from Pergamon. From Garrison, D. R., Anderson, T., & Archer, W. (1999). Critical inquiry in a text-based environment: Computer conferencing in higher education. *The Internet and Higher Education*, *2*(2-3), 87-105.)

Cognitive Presence

Many different analytical frameworks have been used to further understand the value of

asynchronous communication within the online learning environment (Meyer, 2004). Cognitive

presence is the ability to construct meaning through sustained communication within a

community of inquiry (Garrison et al., 2000). This is the core aspect of the online learning environment.

Cognitive presence illustrates the higher-order thinking processes and knowledge acquisition attributed to critical thinking (Garrison et al., 2001). Critical thinking and practical inquiry are the most important elements in the development of cognitive presence. The process of learner reflection helps to shape their cognitive presence within the learning community (Garrison, 2003). Critical reflection and peer collaboration are seen as key elements of quality online learning experiences.

Meyer (2005) studied the cognitive processes of learners within the context of asynchronous discussions. She attempted to classify the level of these cognitive processes by using Blooms' taxonomy. She used Blooms' metrics to determine how substantive the online discussions in two online doctoral courses in educational leadership were. She studied the transcripts of 17 student-led discussions from two different doctoral courses and discovered that while online discussion rarely exists at the highest levels of Blooms' taxonomy for long periods of time, it is the ebb and flow of the online discussions that helps to develop cognitive presence. Her findings show that collaborative events are in fact possible and effective within the online learning environment.

Social Presence

The Internet has developed into a very social environment. It is often used as a tool for staying connected with others when separated by time or space. This social connectedness is one of the elements that makes online education attractive. Social networks within the online learning

environment are comprised of many different elements (Aviv, Erlich, & Ravid, 2005). These networks can help develop a positive environment for the learning experience.

Social presence is defined as, "The ability of participants in the community of inquiry to project their personal characteristics into the community, thereby presenting themselves to the other participants as 'real people'" (Garrison et al., 2000, p. 89). Social presence is the vehicle for developing cognitive presence. The process of developing networks with peers develops social presence which can lead to useful collaboration on topics within the course content.

Learners do not enter an online learning environment with social presence. Online instructors are responsible for creating an environment that fosters interaction and collaboration (Gunawardena, 1995). Social presence can be developed in different ways both by the instructor and the online environment (Palloff & Pratt, 1999, 2003; Salmon, 2003). When seeking to foster social presence, the specific learning context and learner demographics must be considered.

The literature contains many examples of best practices for the development of social presence within online learning communities. Rourke, Anderson, Garrison, and Archer (1999) developed a framework for the study of social presence in an online learning environment. They defined the concepts of intimacy and immediacy as an important part of the success of social presence within the online learning environment and developed a rubric for the assessment of communication. This rubric labeled communication as interactive, affective, or cohesive. Additional classifications can be made using several other indices. They discovered that rich online communication generally contains characteristics of all three domains.

Rourke and Anderson (2002a) were among the many researchers who used this framework (Rourke et al., 1999) to identify discrete communication practices that develop

positive student perceptions within the social atmosphere of textual discourse, including: "addressing others by name, complimenting, expressing appreciation, posting messages using the reply feature, expressing emotions, using humor, and salutations" (p. 7-8). While these practices may seem trivial, they have demonstrated their importance to the development of the social climate of the course.

Richardson and Swan (2003) discovered that online students who had high social presence were more satisfied with the course instructor. Swan and Shih (2005) continued the research and found that the instructor's presence was more important to online learners than the presence of their peers which illuminates the importance of the instructors role within the online learning environment. Fostering teaching presence may be the key element within the COI model.

Teaching Presence

Teaching presence comprises all of the tasks associated with the instructor during the facilitation of an educational experience (Garrison et al., 2000). These tasks do not necessarily have to be performed by the instructor alone, as students can participate by leading online discussion. Some researchers have found that students prefer to have their peers lead online discussions rather than the course instructor (Rourke & Anderson, 2002b).

Online instructors have many different roles within the development and facilitation of online learning environments (Berge, 1995, 2001; Liu et al., 2005). Anderson et al. (2001) argues that teaching presence includes the following characteristics: design and organization, facilitating discourse, and direct instruction. Even though many elements are involved in developing

61

meaningful and memorable learning experiences, teaching presence is the single component that binds them all together within the online learning experience providing a balance between cognitive and social aspects within the educational objectives (Garrison et al., 2000).

Online students have described the best online instructors as the ones who create a learning environment that includes strong elements of social, cognitive, and teaching presence (Perry & Edwards, 2005). Pawan, Paulus, Yalcin, and Chang (2003) posit that a lack of teaching presence within online collaborative events will yield low-level cognitive interactions between learners. Low-level exchanges should not be considered a negative aspect of any online interactions between learners but the desired goal should be for learners to engage in high-level thinking and dissemination of newly discovered knowledge in order to stimulate the learning experience of all members of the community.

Shea, Li, Swan and Pickett (2005) developed a rubric to examine the role between the online learning community and teaching presence. They discovered that there is a positive correlation between teaching presence and the students' sense of connectedness and learning. This demonstrates the importance of the instructor role in removing distance between online learners.

The teaching presence of the online instructor has been shown to be an important part of the success of online learning experiences (Kanuka & Garrison, 2004). Many different approaches and activities have been successful within the online learning environment (Palloff & Pratt, 2005), but the instructor must be aware of them and use them effectively to foster cognitive growth. Without teacher presence, it may be impossible to develop engaging learning environments no matter how intellectually stimulating a learning activity is.

Strengths and Limitations of the Community of Inquiry Model

The COI model has been touted by many as one successful recipe for the creation of high quality online educational environments. There are many benefits of the COI model that make it useful for the development of several types of online learning applications.

COI focuses mainly on pedagogy as opposed to the technical aspects of instructional design. It is an effective tool that can be used by developers and instructors alike for the development of meaningful, collaborative learning within the learning environment. During the implementation of a course, the instructor can utilize the framework of COI to further understand the placement of online interactions within the learning experience. COI does not have all the answers to the development of a successful online learning experience but it does address many key elements.

The COI model does have some limitations. It considers the online community to be far more important to the instructional content. This model does not account for learning events that occur as a result of interaction with instructional materials. It is difficult to develop meaningful interactions around a subject that learners have never been introduced to. COI does not address the need for interaction and interactivity within the learning experience. Palloff and Pratt (2005) define "interaction" as "the all-important student-to-student and student-to-instructor interaction" (p. 4). They see "interactivity" as a characteristic that is developed by interacting with content prior to the construction of knowledge. Their research shows that learners need instructional content in order to construct their personal knowledge. The format of the instructional content is not important but the content itself must be present. Because COI does not specifically discuss

instructional content, novice instructors or designers may assume they are not needed within the learning environment.

COI also does not consider the external learning community. Adult learners have several different sources for information and many of these sources may be outside the boundaries of a specific course. These sources may be integral to the learning experience and should be valued. It is even possible for some of these external sources to replace sources internal to the course itself. The COI model attempts to address all aspects of the learning experience. However, without addressing external influences, this may not be possible.

Self-Paced Learning

As online learning continues to grow, new ways of learning will be developed that expand the concept. Sims and Bovard (2004) argue that the needs and preferences of learners should be integrated into any learning environment. These needs and preferences will change as society and technology evolve and continue to shape the perspectives of learners.

Self-paced asynchronous education is a modality that continues to grow. Within the self-paced course, learners proceed through the learning materials at their own pace providing a level of independence that does not exist in synchronous modalities. The self-paced model considers learners to be individuals who are also members of a larger online learning community. It understands that all of the individuals within the group will have specific course goals and time schedules. Self-paced learning provides the learner with additional flexibility in the pace of completing course work.

Those opposed to additional learner flexibility refer to the success of instructional approaches that place emphasis on guiding student learning (Mayer, 2004; Sweller, 2003). Others believe that self-paced learning is bound to fail (Kirschner, Sweller, & Clark, 2006). These detractors believe that structured instruction is the key element within the transfer of knowledge to learners. Daniel and Marquis (1988) call for moderation however, and indicate that distance educators should find balance between structure and learner independence within the learning environment.

The concept of self-paced learning is quite similar to self-directed learning. Self-paced learning is concerned with the specific learning activities conducted by an individual learner and self-directed learning provides the learner with the opportunity to choose his preferred learning environment. Many researchers including Tough (1979) helped to promote the concept of self-directed learning. Self-directed learning is an important model within the field of andragogy and it continues to garner significant attention within the literature as a bona fide mode of adult learning (Brookfield, 1984; Garrison, 1997; Knowles, 1975; Moore, 1986; Oladoke, 2006; Piskurich, 1993; Song & Hill, 2007).

Another part of self-paced learning is self-regulation. Self-regulation includes all of the cognitive and social processes that are included within an individualized learning environment. Addressing the amount that learners are "metacognitively, motivationally, and behaviorally active participants in their own learning process" (Zimmerman, 1989, p. 329), self-regulation includes learners thoughts, feelings, and actions and is often developed by a host of behavioral, environmental, and individual elements (Hodges, 2005). Because the online learning environment contains so many opportunities and challenges, considerable research has been

conducted to determine the specific stratagies to be used when designing and implementing self-regulated learning experiences (Dell, 2006; Williams & Hellman, 2004).

Whipp and Chiarelli (2004) studied self-regulation within the online learning in an attempt to discover if the methods used by learners to self-regulate the online learning process are different from those of the more traditional face-to-face or distance education contexts. They studied 15 students in an online graduate course, and discovered that learners continually adjusted their own self-regulation strategies to fit the specific online learning environment. These adjustments included goal setting and planning, organizing and transforming instructional materials, structuring the learning environment, seeking help, self-monitoring and record-keeping, and self-reflection. In each of these areas, online learners adapted traditional face-to-face approaches to suit their online learning experience. They indicated that sound course design and instructor support was a key factor in helping them develop their online learning strategy. Additional studies have supported these indications and have further emphasized the importance of course design in influencing self-regulation measures adopted by learners (Chang, 2005; Fisher & Baird, 2005).

Sequenced learning activities are often found at the core of course designs that promote self-regulation. Contemporary online learning initiatives often include sequenced learning activities that are combined with purposeful interpersonal communication. Holmberg (1989) argues that a self-paced distance education environment that includes sequenced learning activities combined with frequent communication and assignment exercises is a key element in providing the maximum amount of access to education while accommodating the needs and preferences of the individual learner. However, we cannot assume that all learners prefer to learn

in a structured or less-structured environment. Ke and Carr-Chellman (2006) realized that some

learners prefer to learn in a more solitary environment. Their research attempted to answer the

question, "In online learning environments that require collaboration, how do solitary learners

experience their own learning?" By studying the behavior of five solitary learners in an online

collaborative environment, Ke and Carr-Chellman discovered that some learners preferred

interpersonal interactions specifically related to the learning matter and not connected to other

learners. These types of findings support the notion that some learners would rather be

independent within their learning environment. Self-paced courses are one way to meet that

need.

Student and faculty views on learner-centered interpersonal interactions as well as their

perspectives on how to facilitate group collaboration within learner-paced educational

environments are notably absent from the literature (Anderson et al., 2005). Anderson et al.

(2005) call for the development of new tools to support interactive events for students within

learner-paced courses. These tools would allow learners to develop their own learning networks

and to connect with many different learning agents. As these tools continue to improve, there is

hope that learners will one day be able to have the benefits of independence and discourse they

prize.

Non-restrictive learning environments that promote meaningful, learner-centered

interaction are increasing in popularity among adult learners. Anderson (2006a) conducted a

study that showed 78% of respondents either agreed or strongly agreed that they would interact

with other students within a given course as long as they could progress through the course at

their own pace. Students would rather be involved in interactions that were not tied to course outcomes or pace.

Developers and instructors must use caution when developing interactive events in the self-paced learning environment. It can be very difficult to remove the transactional distance barrier while providing maximum control for learners within the self-paced learning experience. There is not much evidence supporting the notion that effective learning is cohort dependent, however sufficient evidence exists within the literature to suggest that meaningful interactions with other learners within the learning environment can enhance learning and course completion rates (Anderson et al., 2005; Strachota, 2003; Su et al., 2005).

An important task for developing learner-paced online learning is to develop collaborative activities within learner-paced courses so that learner pacing and collaboration can exist. Interaction within groups of self-paced learners has traditionally been difficult because collaboration has always been based on synchronous activity. Additionally, learner-paced courses often have a difficult time generating a critical mass of students necessary to develop a learning community because these learners are often uninhibited by specific time constraints. Because of this, course sizes are often unpredictable and the number of students within any given course can vary widely.

Currently, asynchronous communication within a closed learning management system does not appear to be well suited to support collaboration within a self-paced learning environment. New types of learner-directed computer-mediated communication tools hold great promise for providing collaborative events for learners at different stages of the learning process as well as individuals who are not enrolled in the same course as the specific learner. Educational

institutions are just beginning to understand the implications of these social networking tools and how they can support varying and unique interactive events between adult learners.

Summary

The development of a collaborative learning environment is one key component of the success of an online learning initiative (Garrison & Anderson, 2003; Jung et al., 2002). Interaction is a very complex construct and the methods of developing meaningful interactive events are almost as vast. However, using new approaches for this development just because they exist is not practical. The decision to use a specific approach should be grounded upon existing research on the online learning experience that is being conducted and be focused on using the types of collaborative tools that learners indicate are best suited to their learning experience.

Realizing the importance of the role of interaction within the online learning environment, many studies have attempted to find the right balance of interaction within instructor-paced contexts (Angeli et al., 2003; Curtis & Lawson, 2001; Pawan et al., 2003; Rourke & Anderson, 2002a). Additional studies have attempted to quantify the impact collaboration has on learning outcomes (Ho, 2005; Meyer, 2004; Picciano, 2002; Rovai & Barnum, 2003). Yet few have specifically explored learners' preferences for specific collaboration tools in online learning environments. As Piccano (2002) notes, "new situations created through new technology require new study and evaluation" (p. 25). As online education continues to expand, the need for further research on the new tools and frameworks being developed continues to grow as well. This study will provide a valuable contribution to the literature concerning the preferences of learners for specific online collaboration tools.

CHAPTER 3. METHODOLOGY

Statement of the Problem

Collaboration as a subset of interaction has long been identified as a key element to successful distance education programs (Beldarrain, 2006; Moore, 1993). While not the sole indicator of high-quality and effective distance education programs, there is significant evidence to suggest that meaningful collaboration with other students and the instructor is important to the development of thriving learning environments (Brown, 2001; Garrison & Cleveland-Innes, 2005; Greene, 2005; Lee et al., 2006; Swan, 2002). Engaging collaboration is an important part of the development of a sense of social connectedness and has been found to enhance both the learning experience and increase course completion rates (Garrison, 2003; Su et al., 2005; Swan & Shih, 2005).

There are many existing theories and models for developing and assessing collaboration within the online learning environment. Instruction that has insufficient or ineffective collaboration opportunities may lead to student isolation, while exorbitant levels may lead to overload or frustration (Berge, 1999; Willging & Johnson, 2004). Enough research has not been done on the perspectives of students concerning their experiences regarding collaboration within learner-paced education models (Anderson et al., 2005). Researchers such as Anderson (2003) and Hirumi (2002) have offered frameworks for the development of collaboration rich instructional environments. However, little research has been done on the effectiveness of specific tools used to facilitate these collaborative events. Additionally, there is little evidence of

the value that learners place upon the various types of collaborative tools within the distance education framework.

Purpose of the Study

The purpose of this study was to contribute to existing research advocating for the purposeful design of collaborative and interactive events within the distance education experience (Chang, 2006; Hirumi, 2002). Many researchers have found collaboration and interaction in general to be a key element in the success of distance learning initiatives. However, few have examined the preferences for collaborative tools through first-hand accounts of learners (Anderson et al., 2005; Wallace, 2003). Previous studies have been mainly focused on quantitative measures of interaction and its impact on learning, but lack the rich insights possible through in-depth interviews of students concerning the specific preferences for online collaborative and interactive tools within the distance education process itself (Ho, 2005; Rovai & Barnum, 2003). This study will contribute to the previous research on collaboration and interaction within the distance education process by examining learner preference for specific collaboration and interaction tool subsets.

The specific preferences learners have for collaborative tools within distance education environments have not been well documented within the research literature. One reason for this may be that each distance education environment is unique and it is therefore problematic to generalize findings across all learning venues. Additional research is needed to further define the assertions by Anderson (2005) and Hirumi (2002) that interaction is necessary and to provide empirical evidence for the specific tools to be used for facilitating collaborative and interactive

events within distance education. This study will build upon the existing knowledge of distance education by specifically examining the preferences of learners in an online self-paced distance education learning environment that includes numerous collaborative and interactive events as well as instructor facilitation designed to create an engaging and meaningful learning experience. This study sought to learn what specific online collaborative tools learners' value most.

Research Questions

This exploratory study examined the experiences and preferences of learners in a distance education environment concerning the various collaborative tools they encounter in a self-paced online course. The following four primary research questions guided the data collection and analysis efforts:

1. What collaborative tools do learners use most in online courses?

2. What collaborative tools do learners value most in online courses?

3. What collaborative tools do learners in online courses identify as providing the most equivalent collaborative and interactive experience as a face-to-face course?

4. What impact do learners in online courses perceive interaction to have on the distance education learning experience?

Research Design

This study will build upon previous research in human interaction within an online learning environment and document the experiences of adult learners participating in an asynchronous online course. This study was conducted using a mixed methods research approach.

Mixed methods research allows the inclusion of issues and strategies that surround methods of data collection, methods of research, and related philosophical issues (Johnson, Onwuegbuzie & Turner, 2007). When qualitative and quantitative datasets are mixed, the datasets often provide richer insights into the phenomenon than if either qualitative or quantitative datasets alone were used. Additionally, using a mixed methods approach provides strengths that offset the weaknesses inherent in each sole approach (Creswell & Plano Clark, 2007; Jick, 1979). Rather than limiting the study to a single ideology, the research will be able to utilize all possible methods to explore a research problem.

Researchers have been collecting both quantitative and qualitative data in the same studies for years. However, the notion and acceptability of analyzing different data types within the same study resulting in a distinct research methodology has only become an acceptable form of research within the past decade (Creswell & Plano Clark, 2007). Discussions still continue among scholars surrounding the various tenants of mixed methods research, such as: nomenclature and basic definitions used, design issues, issues in drawing inferences, and logistics of conducting mixed methods research (Teddlie & Tashakkori, 2003). In spite of this, mixed methods research has continued to grow from a subset of traditional quantitative and qualitative approaches to be recognized as a viable and effective methodology that is different from other research frameworks (Creswell & Plano Clark, 2007; Tashakkori & Teddlie, 2003). Mixed methods research approaches can bridge the rift that still exists in some venues between quantitative and qualitative research (Onwuegbuzie & Leech, 2005).

Mixed methods research was developed as a result of significant improvement in qualitative research methods during the twentieth century, defined by Denzin and Lincoln (1994)

as: the traditional (1950-1970), blurred genres (1970-1986), the crisis of representation (1986-1990), and postmodern or present movements (1990-present). Tashakkori and Teddlie (2003) discuss the similarities between the development of qualitative research and mixed methods research methodologies, indicating that a substantial amount of significant mixed methods studies took place as early as the time period from 1900-1950. Such examples of early mixed methods research approaches often involved the extensive use of interview and observation protocols. As more and more studies were conducted using the mixed methods approach, the debate surrounding the validity of the approach itself grew (Tashakkori & Teddlie, 1998). As mixed methods research has become increasingly popular and has been rigorously scrutinized, it now has become its own methodology separate from both qualitative and quantitative methods. Mixed methods studies can leverage strengths of both the qualitative and quantitative approaches (Greene, 2008; Johnson & Onwuegbuzie, 2002).

Many reasons exist for employing a mixed methods approach in research. One primary reason is to utilize both qualitative and quantitative data in a single research study. Doing so allows for the measurement of, "overlapping but also different facets of a phenomenon, yielding an enriched and elaborated understanding of that phenomenon" (Greene, Caracelli, & Graham, 1989, p 258). While a single approach may only yield surface level data, using several different methods can yield much deeper insights into the subject matter (McMillan & Schumacher, 2006). The expansion of knowledge from one method to another is a strength that often leads to substantiated findings from several different data sources. Some researchers have even gone as far as to claim that mixed methods research approaches frequently result in superior research as compared to utilizing any single method approach (Johnson & Onwuegbuzie, 2002).

Interest in mixed methods research approaches continues to grow as evidenced by the vast number of books, journal articles, and funded research projects available today utilizing the mixed methods approach to research. Entire journals, such as the *Journal of Mixed Methods Research,* are published to specifically discuss the scholarly dialogue surrounding the dissemination of mixed methods research. Previous studies in the literature illustrate how mixed methods approaches may be used to address research questions particularly in the field of online education (Franklin, Peat, Lewis, & Sims, 2001; Mehanna, 2004; Oladoke, 2006; Swan & Shih, 2005).

Mixed methods research approaches have inherent challenges just like any other research approach. Mixed methods research is complex as it employs different approaches to investigate the same problem. Additional time and resources are often necessary to collect and especially to analyze both quantitative and qualitative data (Lodico, Spaulding, & Voegtle, 2006). Mixed methods research procedures are usually more complicated and often require additional effort to provide clear presentation of their findings. All of these aspects must be considered when deciding which research method to utilize when conducting a study.

This study sought to gain value from participants' first-hand accounts of their preferences for collaboration tools within an online learning environment. Therefore the selection of the mixed methods framework was used. The resulting data from the mix of quantitative and qualitative interview questions included a combination of rich narrative accounts along with numeric frequencies of engagement. The mixed methods approach is ideally suited for addressing the proposed research questions because previous researchers have used it successfully to gain important insights from participants of novel online education initiatives

(Mehanna, 2004; Oladoke, 2006; Swan & Shih, 2005). Data was collected in the form of semi-structured, in-depth interviews conducted during and near the conclusion of the course to understand, from the perspective of the learners, the preferences for specific collaboration tools within an online learning environment. Such rich learner perspectives provided an enlarged and deepened understanding of learner's preferences for specific collaboration tools within an online learning environment, which will add value to the body of knowledge by helping to form a solid foundation for future inductive or empirical studies.

Both quantitative and qualitative methodologies, "describe their data, construct explanatory arguments from their data, and speculate about why the outcomes they observed happened as they did" (Sechrest & Sidani, 1995, p 78). This study was primarily qualitative in nature and the majority of the interview questions yielded rich narrative responses from the participants regarding their individual experiences. Additionally, the frequencies of engagement with specific collaboration tools also provided great insights into the overall experiences and ultimately the specific preferences that participants have for online collaboration tools.

Sampling Design

Participants

The participants for this study were online adult learners enrolled in a fully-online course offered by a public, higher education institution located in the southeastern part of the United States. This study specifically limited its scope to investigate the online collaboration experiences and preferences for online collaboration tools of learners in order to provide in-depth data concerning the distinctive aspects of online collaboration and the specific tool preferences

learners have within this unique learning environment. The one-semester course on research methods in psychology offered by The University of Central Florida (UCF) employed an online, emergent and flexible design. The characteristics of this course provided an appropriate context in which to explore the preferences learners have for specific collaborations within an online learning environment. The University of Central Florida's Institutional Review Board granted permission for the study to be conducted within a research methods course and the instructor of the course pledged to provide the necessary access to the selected group of adult learners.

Sample Course Characteristics

The study sample included all learners enrolled in the Research Methods in Psychology course at UCF. This course was an online section containing over 200 students. Participants were afforded the freedom to proceed through the course materials and activities in an online setting. Explicitly detailed research design and methods were therefore essential to combat the existent opportunity for bias as well as threats to reliability and validity. The course selected was constructed within the Blackboard learning management system (LMS) and incorporated a variety of asynchronous computer-mediated communication tools standard in the LMS.

Participant Selection

Learners enrolled in an online section of Research Methods in Psychology served as a convenience sample for this study. The professor solicited the students' voluntary participation and said there was no penalty for not participating. The researcher delivered surveys online to the learners. Those who chose to participate in the study electronically signed the informed consent document and completed the online survey.

The researcher chose to use a common approach within education research, the convenience sampling technique, because the characteristics of this specific group of individuals matched the attributes of phenomenon being studied (McMillan & Schumacher, 2006). The study sample included all learners who chose to participate in the study as indicated by signed consent documents. The researcher restricted the sample size to this select group of learners because they were the most current cohort of learners to be actively enrolled in an online course at the institution at the time of the study and had the freshest memory of their experience, considered vital by researchers who claim that the farther removed a participant is from the direct experience, the more difficult it is for them to recall their experience (Fink & Kosecoff, 1998).

Time Frame

The researcher conducted this study during a 16-week time period in the spring of 2009. The course studied was an online course, which afforded the learners the flexibility to complete the course at a distance within 16 weeks. The researcher contacted all learners enrolled in the course by e-mail once the study began. The learners were asked to volunteer to take part of this study and were informed that they were not required to do so. During the eighth week, the researcher asked students who elected to be part of the study to complete the Long-Dziuban instrument. Starting in the eleventh week, the researcher asked participants to participate in an interview not to last more than one hour. The interviews, conducted over a two-week time frame, were digitally recorded. Consistent with recommendations from the literature concerning transcription and data analysis, the researcher allotted an estimated five hours for transcription for each one hour of interview.

Measures

The researcher selected a convenience sample of learners having recently completed a self-paced online course to participate in in-depth interviews to share first-hand accounts of their interaction experiences and preferences in an effort to glean a holistic understanding of the dynamics of and learner preferences for interaction within less structured online learning environments. Such rich learner perspectives provided an enlarged and deepened range of immediate experience, adding great value to the body of knowledge by forming a solid foundation for future inductive or empirical studies. The researcher analyzed and coded the interview transcripts for emerging themes. Self-reported frequencies of engagement in the various interactive components of the course were collected from participants during the interviews and analyzed as well. The resulting findings included both the collective and comprehensive perspectives of UCF adult learners as they shared their experiences and preferences for interaction within the self-paced online education environment.

The researcher selected the semi-structured open-ended interview method for data collection because it provides a consistent and yet flexible inquiry framework (McMillan & Schumacher, 2006; Patton, 1990). At the core of this process is the desire to understand adult learners' perceptions, perspectives, and understandings of interaction within online learning. This mixed methods approach facilitated the examination of experiences from multiple perspectives involving data in multiple forms, leading to the formation of generalizations concerning the true essence of the experience from an insider's point-of-view (Leedy & Ormrod, 2001). Interview questions addressed the three main types of interaction described in the literature (e.g., student-student interaction, student-instructor interaction, and student-content interaction) in regards to

both formal and informal learning activities and also explored the tenets of Anderson's (2003) Interaction Equivalency Theorem. The interviews yielded rich narrative descriptions of learners' interaction experiences, preferences, and frequencies of interaction engagement in an attempt to understand the interaction dynamics and optimal integration within an online self-paced adult learning program.

Data Collection Procedures

This study involved a quantitative online survey ($n = 125$) and semi-structured open-ended interviews with each learner agreeing to participate ($n = 10$). Permission to conduct this study was granted by UCF via submission of appropriate documentation to the Institutional Review Board (IRB). Since sampled learners were distributed across Central Florida, interviews were conducted over the phone and in person. The researcher used semi-structured, open-ended interview questions concerning learner perceptions and preferences for specific collaboration tools within the online learning environment in order to gain deeper insight into learners' experiences engaging in the various forms of interaction within the course (see Appendix A). All interviews were recorded digitally and then manually transcribed and coded as part of the data analysis process. The researcher used the PowerGramo Skype Recorder, in conjunction with a laptop computer to record each phone interview then manually transcribed and coded the interviews for emerging themes. Member checking strategies were utilized which involved sending transcripts of interviews to the corresponding interviewees to confirm accuracy prior to coding.

Each interview consisted of a total of 82 pre-determined questions. Interview questions were derived from a review of premier themes within interaction literature and addressed the three main types of interaction described in the literature (e.g., student-student interaction, student-instructor interaction, and student-content interaction) in regards to both formal and informal learning activities. The questions also explored the tenets of Anderson's (2003) Interaction Equivalency Theorem and learner's preferences for specific collaboration tools within online courses. The researcher provided questions to all participants prior to the interview to allow learners to reflect on the questions and subsequently give more substantive responses. At times throughout the interview, the researcher asked follow-up questions to help clarify or expand upon responses. The complete list of interview questions is found in Appendix A.

Ethical Issues

The ethical veracity of any study is of utmost importance because the protection of participants is among the most important characteristics of reputable and reliable research. Every effort was made throughout this study to ensure that the privacy of each participant was protected. The researcher contacted all eligible learners enrolled in the selected course section via e-mail and invited them to participate in the study. Those agreeing to participate in the interview were asked to return to the researcher an electronically signed copy of the informed consent form and to provide the researcher, either via e-mail or phone, their contact information in order to set up a mutually convenient time to conduct the interview. The researcher informed participants that interviews would be recorded confidentially for the purposes of the study only. Once transcribed, the resulting interview transcription was sent via e-mail to the participant to

ensure accuracy. Interview data, including recorded audio files and transcribed text data, was securely stored electronically using assigned identification codes in place of any participant names or other identification information. Pseudonyms were used in place of participants' actual names in the data analysis and results to ensure that identities of the participants were protected.

<center>Data Analysis Procedures</center>

At the core of many mixed methods research approaches is the quest for collecting and analyzing a mix of quantitative and qualitative data within a single study in order to grasp the truest sense of participants' first-hand experience of phenomena. In fact, it has been argued that such approaches to empirical inquiry affording methodological pluralism frequently result in superior research as compared to monomethod research (Johnson & Onwuegbuzie, 2002). Consistent with inductive research, data analysis efforts involved recognizing categories of description as a primary outcome of the research activities (Marton, 1988). In a more simplistic sense, the goal of such a study is ultimately to take the perspectives of participants experiencing the phenomenon first-hand and categorize such individual experiences into collective groupings where conclusions can then be drawn from. To that end, the data analysis process involved identifying emergent themes from the data that served as foundational schema for further data organization and analysis.

While there is no single approach for coding all qualitative data, certain techniques have been shown effective in organizing and classifying data for further analysis. In particular, the coding scheme that includes selection procedure based upon criteria of relevance provides a solid foundation for organizing, coding, and categorizing data (Charles & Mertler, 2002; McMillan &

<center>82</center>

Schumacher, 2006). Transcripts of learner interviews were reviewed and coded to determine

emergent themes. Responses were grouped by question as part of the initial analysis process to

aid in the comparison of responses to similar questions. As additional patterns and categories

were identified, successive codes emerged that were utilized to further describe the data. The

triangulation of data through multiple sources, including verbatim transcripts, comparisons of

qualitative responses to quantitative data from interview questions, and reviewer notes in

conjunction with member checks of transcribed interviews, was useful in strengthening and

validating findings.

Expected Findings

Based on a review of the literature concerning interpersonal interaction, the researcher

expected that one or more types of collaboration tools would surface as being preferred for adult

learners in the online learning environment. While learners may in fact value one collaboration

tool over others, it was certainly possible that they may value other types of collaboration tools

as equal.

CHAPTER 4. DATA COLLECTION AND ANALYSIS

Statement of the Problem

Collaboration as a subset of interaction has long been identified as a key element to successful distance education programs (Beldarrain, 2006; Moore, 1993). While not the sole indicator of high-quality and effective distance education programs, there is significant evidence to suggest that meaningful collaboration with other students and the instructor is integral to the development of thriving learning environments (Brown, 2001; Garrison & Cleveland-Innes, 2005; Greene, 2005; Lee et al., 2006; Swan, 2002). Engaging collaboration is integral to the development of a sense of social connectedness and has been found to enhance both the learning experience and course completion rates (Garrison, 2003; Su et al., 2005; Swan & Shih, 2005).

Research on the various approaches to distance education has given rise to varying theoretical bases for judging the appropriateness of incorporating collaboration into distance education. Instruction that has insufficient or ineffective collaboration opportunities may lead to student isolation, while exorbitant levels may lead to overload or frustration (Berge, 1999; Willging & Johnson, 2004). There is a dearth of literature related to the perspectives of students concerning their experiences regarding collaboration within learner-paced education models (Anderson et al., 2005). Researchers such as Anderson (2003) and Hirumi (2002) have provided frameworks for the development of collaboration rich instructional environments. However, little research has been done on the effectiveness of specific tools used to facilitate these collaborative events. Additionally, little empirical evidence currently exists as to the value that learners place upon the various types of collaborative tools within the distance education framework.

84

Purpose of the Study

The purpose of this study was to contribute to existing research advocating for the purposeful design of collaborative and interactive events within the distance education experience (Chang, 2006; Hirumi, 2002). Many researchers have found collaboration and interaction in general to be a key element in the success of distance learning initiatives. However, few have examined the preferences for collaborative tools through first-hand accounts of learners (Anderson et al., 2005; Wallace, 2003). Previous studies have been mainly focused on quantitative measures of interaction and its impact on learning, but lack the rich insights possible through in-depth interviews of students concerning the specific preferences for online collaborative and interactive tools within the distance education process itself (Ho, 2005; Rovai & Barnum, 2003). This study will contribute to the previous research on collaboration and interaction within the distance education process by examining learner preference for specific collaboration and interaction tool subsets.

The specific preferences learners have for collaborative tools within distance education environments have not been well documented within the research literature. One reason for this may be that each distance education environment is unique and it is therefore problematic to generalize findings across all learning venues. Additional research is needed to further define the assertions by Anderson (2005) and Hirumi (2002) that interaction is necessary and to provide empirical evidence for the specific tools to be used for facilitating collaborative and interactive events within distance education. This study will build upon the existing knowledge of distance education by specifically examining the preferences of learners in an online self-paced distance education learning environment that includes numerous collaborative and interactive events as

well as instructor facilitation designed to create an engaging and meaningful learning experience. This study sought to learn what specific online collaborative tools learners' value most.

Research Questions

This exploratory study examined the experiences and preferences of learners in a distance education environment concerning the various collaborative tools they encounter in a self-paced online course. The following four primary research questions will guide the data collection and analysis efforts:

1. What collaborative tools do learners use most in online courses?

2. What collaborative tools do learners value most in online courses?

3. What collaborative tools do learners in online courses identify as providing the most equivalent collaborative and interactive experience as a face-to-face course?

4. What impact do learners in online courses perceive interaction to have on the distance education learning experience?

Analysis of Qualitative Data

This section will provide a simple analysis of the qualitative data. In my study, I selected a sample population from within an online course at one state supported university in Florida. The qualitative data provided demographic information on the participants. The study found that of the students surveyed (n = 125) 20.8% were male (n = 26) and 79.2% were female (n = 99). The finding are displayed in Figure 4.
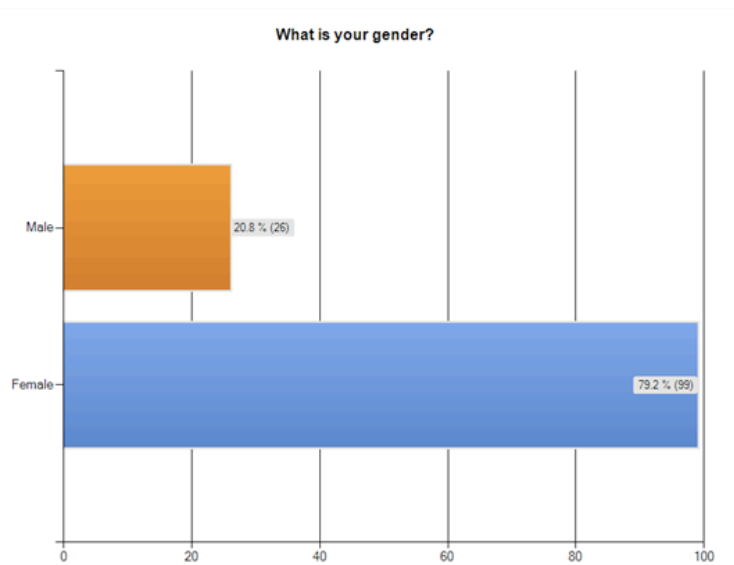
Figure 4. Graphical representation of respondent gender

Respondents were asked to identify their age range. The study found that 65.6% (n = 82) were between 18 and 24 years of age, 16.0% (n = 20) were between 25 and 30 years of age, 4.8% (n = 6) were between 31and 34 years of age, 8.0% (n = 10) were between 35 and 40 years of age, and 5.6% (n = 7) of respondents were 40 years of age or older. The findings are displayed in Figure 5.
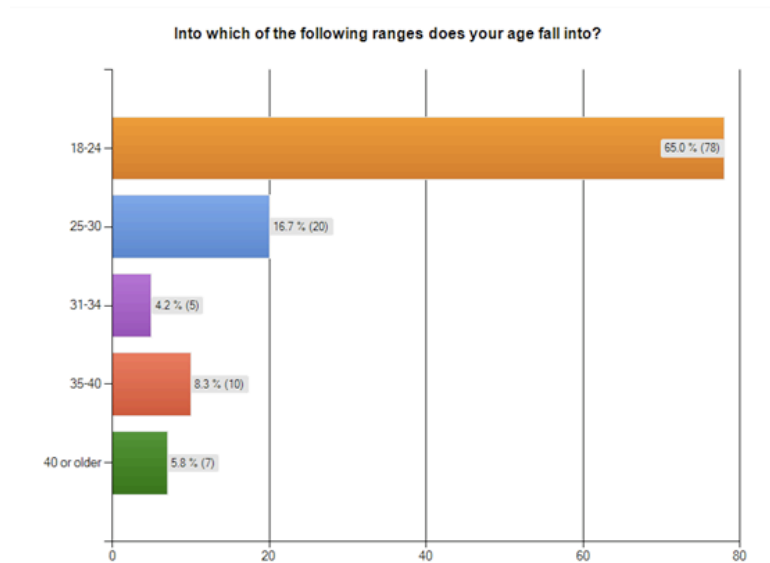
Figure 5. Graphical representation of respondent age

Most of the respondents, 64.8% (n = 81), identified themselves as White while African Americans (n = 13) and Hispanics (n = 22) made up an additional 28.0% (n = 35). The rate of online enrollment by respondents was fairly evenly split in thirds with 29.6% (n = 37) indicating that they had taken 1 to 2 classes online, 37.6% (n = 47) stating that they had taken 3 to 5 classes online, and 32.8% (n = 41) reporting that they had taken 5 or more classes online.

When studying the responses to the personal description within the Long-Dziuban study, more than half, 50.4% (n = 63) stated: "I am highly energized and productive. I like to use my high levels of energy on constructive tasks. I am strongly motivated by approval and very sensitive to the wishes of others. I deeply value close bonds with others which may make it difficult at times to deal with direct confrontation. I do my best to create and maintain harmonious relationships. I am highly idealistic, setting lofty goals for myself." Respondents who selected "I am highly energized and action-oriented. I have little need for approval and I am

unconcerned with who I please. I put thinking into immediate action. I am very frank, speak out freely and I'm truthful about my feelings. I have no problem confronting people," totaled 25.6% (n = 32). The other two groups were respondents who identified themselves as having lower energy. These two groups made up a little less than a quarter 24.0% (n = 30) of the entire survey.

When analyzing the self-responses to behavioral characteristics within the Long-Dziuban study, 64.0% (n = 80) of respondents selected: "Thinks of all possibilities and contingencies before venturing into activities; What if…person; May see the negative side of things; Unwilling to take risks." Additionally 64% (n = 80) of respondents selected: "Highly organized and methodical; Strongly motivated to finish tasks; Perfectionist; Tends to form habits; Extremely diligent in work habits; May be mildly ritualistic." Analysis also showed 41.6% (n = 52) of respondents selected: "Sometimes explosive and quick-tempered; Sharp tongued", while 32.8% (n = 41) of respondents selected: "Very frank; May act without thinking". Finally, 35.2% (n = 44) of respondents selected: "Dramatic; May have wide mood swings; May overreact in some situations; Can have emotional outbursts; Creative thinker (rich imagination); Artistically inclined; Devalues routine work." It should be noted that respondents were asked to select as many descriptions as they felt applied to them. This explains the fact that the responses do not add up to 100%.

A cross tabulation of the results as seen in Figure 6 shows that students who prefer to take courses online tend to be highly energized and productive.
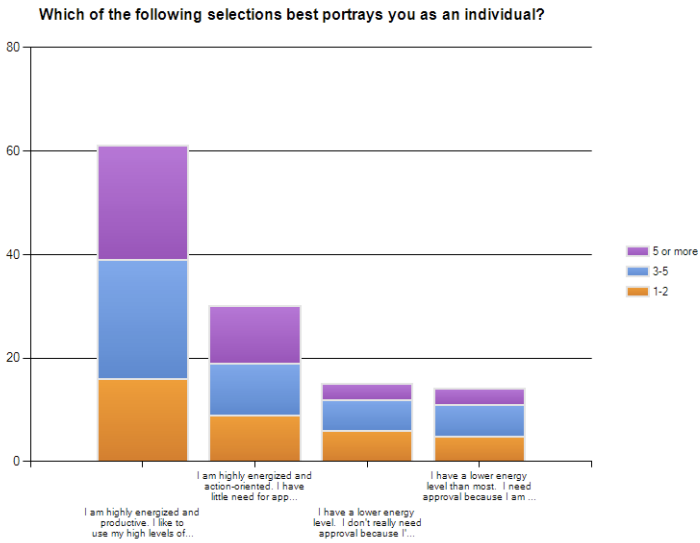
Figure 6. Cross tabulation of number of online courses and Long-Dziuban personality type

Along those same lines, respondents who take online courses also tend to be pragmatic and highly organized as evidenced in Figure 7.
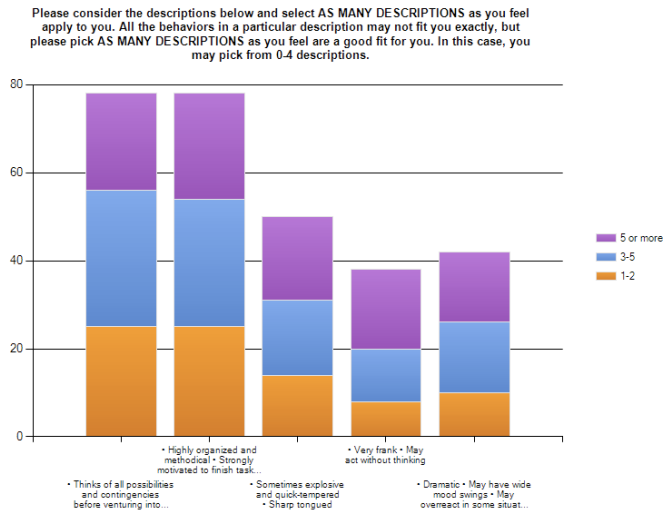
Figure 7. Cross tabulation of number of online courses and Long-Dziuban personality descriptions

Analysis of Research Questions

The interview questions were designed to explore the recent experiences of learners as they completed the course, noting their preferences for the different interactive parts of the self-paced learning experience. The interview questions sought qualitative descriptors from participants.

This study attempted to determine the specific tools learners within a self-paced online learning environment preferred to use. A small sample of students (n = 10) was selected at random to participate in a vocal survey. The questions were designed to answer the primary research questions. When combined with the qualitative data gathered from the larger sample (n = 120), the responses seek to provide answers and shed additional light on the questions put forth by this researcher.

Research Question 1

What collaborative tools do learners use most in online courses?

In order to gain a sense of the forms of interaction that learners engaged in most within a self-paced online course, participants were asked how they prefer to interact with other learners? The responses given reflected a strong preference for both e-mail and discussion boards. The difference noted here was age. Younger students seemed to prefer to use the discussion boards and mature students elected e-mail as their preference. The majority of the mature students indicated that work hours helped them make their choices. These mature students also indicated that they were not always comfortable asking questions in an open forum. E-mail afforded them a reasonable level of privacy.

To provide additional clarity to the first research question, participants were also asked which collaboration tools they preferred to use. Again the results were skewed towards the discussion boards. One participant stated "Generally, I prefer the discussion board as I can interact with my peers within my own timeframe." This theme was repeated over and over again by participants who were older and had full-time jobs. Another participant concurred noting, "I prefer to use the discussion boards. I feel as though I am interrupting people if I send e-mail. Besides, I can often find answers to my questions by browsing the discussion boards."

The concept of gleaning information from discussion boards seemed to be very important for several students. They had the feeling of participation while they remained in the background. The learners realized that many other students within the class had the same questions they had and were willing to ask these questions in the discussion forums. The answers

to many general questions were readily available within the discussion boards because others had asked them and they had been answered.

Summary of Responses to Research Question 1

In analyzing the responses from participants regarding Research Question 1, the research lead to the conclusion that participants engaged most frequently in interactions using the discussion boards. It did not seem to matter if the interaction was with their peers or with the instructor. These interactions seemed to be on both formal and informal levels. Such interactions support the notion of the influence of the "network" and "collective" proposed by Anderson and Dron (2007).

Research Question 2

What collaborative tools do learners value most in online courses?

In order to gain a sense of the collaborative tools learners value most in online courses, participants were asked which tools they valued most in an online course. The responses to this question were very closely aligned to the discussion boards. Learners indicated that the discussion boards "helped us to get to know each other (virtually that is) rather well." Additionally, a learner posited that "the critical thinking discussion within these forums was helpful in the exchange of ideas and points of view."

Learners also appreciated that they had an aggregator of many points of view on the same topic without confrontation. One such learner stated, "…discussion boards are the most valuable because they allow the user to see all posts available to them any time of the day, and the posts

are generally transparent and permanent." Many of the learners found comfort in the fact that "if anything should go wrong, the postings are there to clarify past responses." When questioned further on this response, the learner stated that the discussion board provided a permanent reference point for all discussion. Because of this, it was easy to determine the growth of their peers within the course and within a specific discussion.

Another respondent found the discussion boards to be "…kinda like a clearing house of knowledge for the course. It contains information—past, present and future. It is easy to search and if there is a response that lacks clarity, I still have the option of posting a follow-up question." This led the researcher to believe that the learner understood that he or she was practicing the construction of knowledge. The learner was comfortable with the idea of developing her understanding of the material by challenging others on their position surrounding a specific subject.

Other learners indicated that the discussion board provided them with a sense of inclusion that was not found in the face-to-face modality. "Sam" stated "Discussion boards……were most important for me in my experience. I attended college via campus for three years and never did I build the relationship or receive the kind of feedback I got from my online facilitator."

Summary of Responses to Research Question 2

In analyzing the responses from participants regarding Research Question 2, the researcher found that participants value the discussion boards and e-mail the most within an online course. Through narrative dialogue, participants expressed their preferences for quality interaction within the discussion boards as being most important to the overall success of an

94

online course. Subsequent interview results supported the qualitative rankings that participants

assigned to discussion boards and e-mail within the online course. Some learners reported that

while all of the tools available for interaction were important, they valued most the interactions

they had within the discussion board environment. Participants agreed that a well-designed

course was crucial to the success of their online learning experience.

Research Question 3

What collaborative tools do learners in online courses identify as providing the most equivalent

collaborative and interactive experience as a face-to-face course?

In order to gain a sense of the collaborative tools learners in online courses identify as

most equivalent to face-to-face collaboration, participants were asked what tools they identified

as providing the most equivalent collaborative and interactive experience as a face-to-face

course. Much like the previous research questions, the responses to this question were fairly

unanimous. Most of the learners indicated they felt that the discussion board provided them with

the feeling of being included in the course as an active participant. It was interesting to note that

many of these learners would be considered a lurker or a participant who does not contribute to

the online conversation. However, these same learners felt that they were an active member of

the discussion community and felt included as a member of the course because of it. "Janet" was

emphatic when she stated: "the discussion boards keep me up to date on what is happening

within the course. It has any announcements from the instructor as well as timely information on

the topics we are currently discussing in the class."

Summary of Responses to Research Question 3

In analyzing the responses from participants regarding Research Question 3, it is clear that the discussion board affords these learners the sense of inclusion and interaction at the same level as face-to-face learning. In fact, some learners feel more involved because of the discussion boards. Participants pointed out that the types of interactions they had within the discussion boards is indispensable within the online learning environment and cannot be replaced easily. The interaction itself cannot be replaced at all. However, the students indicated they felt that the discussion boards most closely simulated their face-to-face experience. Some students did indicate that interaction with their peers on the discussion boards was less desirable than interaction with the instructor on the discussion boards.

Research Question 4

What impact do learners in online courses perceive interaction to have on the distance education learning experience?

In order to gain a sense of what learners think of interaction within distance learning, participants were asked what impact they perceived interaction to have on the distance learning experience. The majority of the responses to this question indicated that interaction had to be high in order for the learner to be comfortable. None of the respondents were willing to take the course without having a reasonable level of interaction with the professor and the course materials. Some of the participants indicated that if the course materials were in a different format other than the textbook they would be all right with that. However, the materials had to be available for them to be comfortable with completing the coursework.

Many of the responses indicated that interaction with students was not as important as interaction with the instructor or the text. "Caroline" said she had doubts as to the value of her peers' input. She stated, "If the students have relevant experiences to share and can add to broadening my perspective, then their interactions cannot be replaced." Caroline went on to say that she had little confidence in the knowledge base of her peers but was willing to give them a chance to change her mind. However, "Caroline" was adamant about the interactions she had with her instructor. She felt that "the biggest draw to the online course was the proximity to the pro."

Summary of Responses to Research Question 4

In analyzing the responses from participants regarding Research Question 4, is the researcher recognized that interaction may have a direct impact on the online learning experience. Participants reported their experiences regarding the different types of interactions they engaged in throughout the duration of the online course and pointed to the important part that the interactions with the instructor, course content, and other students played in their overall learning experience. While interaction with other learners was not the most influential component of the particular course studied, the logical conclusion can be drawn that if the course were structured to value interaction with other learners, these interactions could also be equally important. Further study on this specific question will be necessary to explore whether such hypotheses are in fact confirmed. The self reporting by the learners indicated that they preferred to have these interactions using discussion boards. More recommendations regarding future studies will be shared in chapter 5.

Summary

      This study explored the concept of interaction within an online learning environment. More specifically, the study indicated which tools learners preferred to use to interact with the various elements of the course. The results of this study, to be further discussed in chapter 5, provide guidelines for instructional designers developing instructional strategies for online learning environments.

CHAPTER 5. RESULTS, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

This study embraced a mixed methods approach to explore the preferences that students had for collaboration tools within a self-paced online learning environment to determine what types of interactive tools these students valued most as well as what affect these interactions had on their overall learning experience. Before this study was conducted, there was little empirical evidence of what value the learners place upon the various interaction tools available in a self-paced online learning environment.

Four primary research questions guided the research study. The primary focus of this research was to investigate the tools learners preferred to use for collaboration within the online learning environment. A total of 10 learners from an online course participated in semi-structured interviews sharing first-hand their experience regarding their preferences for collaborative tools. Interview transcripts were reviewed and coded to determine emergent themes. The triangulation of data through multiple sources, including transcripts, comparisons of quantitative responses to survey questions, and reviewer notes aided in strengthening and validating the findings.

Discussion of Research Questions and Findings

Research Question 1

What collaborative tools do learners use most in online courses?

Within distance education frameworks, interactivity is often seen as a significant key to the success of an online learning experience (Brewer & Klein, 2006; Lee et al., 2006). As yet,

this concept has received little attention. Additionally, there is a dearth of literature reflecting on the specific preferences learners have with respect to the tools they use for collaboration.

Emerging tools for interaction based upon the new social computing capabilities of the Web now provide a wide array of interactions at a distance not only within the specified course environment but also across learner-defined domains that go far beyond the scope of the actual course (Dalsgaard, 2006; Dron, 2006b). The psychology course offered by UCF provided several options for collaboration within the course itself.

Participants self-reported that they engaged most frequently in interactions using the discussion boards involving either the course instructor or their classmates. Such interactions support the notion of the informal influence of the "network" and "collective" proposed by Anderson and Dron (2007). These reports also emphasized the points brought forth in literature calling for the development of collaborative exercises within online learning but also for those who facilitate online learning experiences in various formats (Klein et al., 2004; Varvel, 2007). Therefore, interactions within discussion boards should currently be emphasized and not discontinued.

Research Question 2

What collaborative tools do learners value most in online courses?

Collaboration tools may serve many purposes in the online learning environment, but the main focus for may instructional designers and instructors often centers around improving student outcomes within the online learning experience. This study sought to determine the collaborative tools that adult learners valued most in the self-paced learning experience.

Participants seemed to value the discussion boards incorporated into the particular course that was studied as vital to the overall learning experience, noting the sense of inclusion and the availability of specific information surrounding the course. Responses reinforced the value of these learner-directed learning environments. While all of the learners sampled did not take full advantage of the discussion boards, the participants who did expressed overwhelming satisfaction with the content and interaction provided by these boards. Because of the requirements for discussion set forth by the instructor, they felt less likely to engage in superfluous interactions within the discussion board. However, the informal learning environment that was created within the discussion boards placed maximum control with the learners. Such informal learning environments provide a more open venue for learners to connect with others interested in the same concepts of the course (Rhode, 2006).

Responses from these learners support Paulsen's (1993) Theory of Cooperative Freedom, which argues that many learners who choose a distance learning format do it because they are searching for freedom from not only time and place learning constraints, but also the freedom to select the specific type of media, content, and times of access. Such responses continue to give credence to the call for flexible and innovative learning designs that meet the needs of an ever-changing adult learner population.

The fact that many participants in this study valued quality interactions through discussion boards with other learners and the instructor above other interactions demonstrates the necessity for additional efforts to be placed upon the design of instructional materials, activities, and interactions that foster active engagement with content while also continuing to provide opportunities for instructor-learner interaction. While some argue that true self-paced learning

models diminish the role of the instructor, a host of approaches to online education have been shown to accommodate the flexibility and customizability of the online model while incorporating instructor-learner and learner-learner interactions. As participants' responses in this study showed, a balanced approach to incorporating various interactions, especially discussion boards or forums, is often preferred by adult learners in online courses.

In a granular analysis of the various interaction activities available to learners within this course, participants generally reported the activity of participating in discussion boards as equivalent or superior to other types of collaborative interaction such as e-mail or chat rooms. Such findings add to the body of research supporting the pedagogical possibilities of discussion boards as a flexible asynchronous communication tool. Participants also found the array of tools available to them as acceptable and indicated that often times, multiple tools had to be used to provide them with total interactive equivalence. For many of the reporting learners, interactions with other learners in the formal learning space were seen as tangential, and while helpful, were not mandatory to achieve a desirable learning outcome.

Research Question 3

What collaborative tools do learners in online courses identify as providing the most equivalent collaborative and interactive experience as a face-to-face course?

While learners may have different preferences for collaboration tools within online learning environments (Sims, 2003), it continues to remain important to determine if participants in online learning experiences believe that the tools they are provided for collaboration are equal to face-to-face collaborative tools. The perceived value of interaction modality will to a large

extent determine its current and future role within the online learning experience. A lack of collaboration tools may lead to student isolation, while collaboration tools that are not consistent with learner preferences may lead to overload or frustration (Berge, 1999; Willging & Johnson, 2004).

This study sought to determine the preferences of learners concerning the various collaboration tools they use in an online course while questioning the presumption made by Anderson (2003) that a measure of equivalency exists among various collaboration tools within the online learning environment. Anderson's theoretical basis for equivalence maintains that as long as one of three primary forms of interaction (student-teacher; student-student; student-content) is at a high level, other forms may be minimized or eliminated without adversely affecting the learning experience. This rationale is being extrapolated to support the design of learning approaches that maximize the student-student and student-teacher interaction and to further determine which specific tools learners prefer to use when engaging in these collaborative exercises.

The results of this study have provided a small glimpse into learner preferences for interactive tools and serve as just one inquiry into whether equivalency truly exists among the various types of interaction events used within an online course. Participants indicated that quality interaction with other learners and with the instructor is indispensable in the online learning environment and cannot be replaced. Participants further noted that while discussions with learners in an online environment are important, interactions with the instructor are indispensable.

What impact do learners in online courses perceive interaction to have on the distance education learning experience?

The preferences of online students for specific collaboration tools have rarely been explored within the literature. However, researchers have consistently found that interaction is essential for successful learning experiences within either the traditional classroom or the contemporary online learning environment (Friesen & Anderson, 2004; Keenan, 2002; Su, 2006; Swan, 2002; Wallace, 2003). While not the sole indicator of high-quality and effective online education programs, there is significant evidence to suggest that meaningful interaction with other students and the instructor is integral to the development of thriving learning environments (Brown, 2001; Garrison & Cleveland-Innes, 2005; Green, 2005; Lee et al., 2006; Swan, 2002).

This study expands upon previous research advocating for the purposeful design of interactive events within the online learning experience (Chang, 2006; Hirumi, 2002). It is recognized that interaction and collaboration may have a direct impact on the online learning experience. Participants reported their experiences regarding the various types of collaboration tools they valued most throughout the duration of an online course and pointed to the important part those interactions with the instructor and other learners played in their overall online learning experience.

Participants indicated that the interactions they had with learners and the professor within the discussion board environment were a critical component of the quality of the online learning experience. Such conclusions support long-standing claims stressing the necessity for systematic

design of instruction that encourages pedagogically-sound methods and incorporates emerging approaches such as discussion boards appropriate to meet the needs of learners (Kays & Sims, 2006; Koszalka & Ganesan, 2004). When asked if collaboration with the instructor or content could be diminished or eliminated and therefore compensated for by other forms of collaboration, participants refuted these ideas. Further studies will be necessary to explore whether such hypothesis are actually confirmed.

It has been recommended that designers be cognizant of the unique cultural and situational/social contexts of learners that influence the ability for learners to engage in online learning environments (Sims & Stork, 2007). Such designs should also include the current preferred collaboration tools to further enhance these interactions. Designers should be aware of each of the different tools and incorporate them as often as possible in an effort to provide learners with the best tools to control their learning experience.

<center>Recommendations</center>

Even though this study provides important contributions to the body of knowledge surrounding the design of interactive course materials for online education, it is worth mentioning the recommendations that may increase the overall impact as well as provide guidance to further studies that need to be conducted.

This study was conducted merely to provide a deeper understanding of an educational intervention from the perspective of the learners and to pave the way for future studies. The very nature of this inquiry was grounded in the premise that multiple perspectives exist for every situation. However, the significance of the perspective of the participant defines reality

<center>105</center>

(McMillian, 2000). The insights provided by the participants are specific to that population and cannot be projected upon other populations. This study focused on learner preferences for specific collaboration tools in an online learning environment and did not explore instructor-preferred or administration-preferred tools and methods that were worthy of analysis. Further studies could explore these preferences and perspectives within the online learning environment as well as include the perspective of other institutions or programs beyond the base of this study.

Similar future studies will add valuable contributions to the field by studying the same learner preferences within different courses of studies utilizing a variety of instructional styles and in varying locations. Successive studies could also involve differing learner populations, including varying age groups, personality types and socio-cultural status to ascertain whether such influences impact these preferences. Additional studies are needed to measure the affect that these emerging collaboration tools on the overall learning experience.

Conclusions

A host of interactive events are possible within an online learning environment. Some are viewed as essential and others may assume a more supplemental role. This study built on previous studies of the effect of collaboration within an online environment and sought to further determine the preferences learners had for specific online collaboration tools. Participants reported that they preferred to interact with other students and their instructor using the discussion board within the online learning environment. Additionally, the participants believe that their interaction with the text was of less importance than their interaction with the instructor. Learners indicated that the discussion board was valued over all other collaboration

tools available within the course. However, it is certainly possible that in other learning environments such findings may differ. Further study is needed to determine whether the initial insights of participants reflect reasonable trends in interaction or merely an isolated instance.

The results of this study provide guidelines for instructional designers developing instructional strategies for online environments. The importance of well-designed instruction was reinforced by this study. The components of "well-designed instruction" can span beyond stimulus-response or drill and practice activities to include a wide range of dynamic interactions using a wide range of increasingly specific tools. Such diverse interactions using the correct tools collectively comprise a dynamic learning environment encompassing one or more learning communities that can expand well beyond the restrictions of any single course selection, thereby connecting learners in unique ways.

APPENDIX A. WELCOME STATEMENT

Welcome Statement

Thank you for being willing to participate in my research study by sharing your recent online learning experiences with UCF. The purpose of this study is to gather first-hand experiences from adult learners regarding of the types of interaction that occur in self-paced online learning environments and in particular what interactions learners like you prefer most.

I'm recording our discussion for data analysis purposes. Please feel free to respond openly and candidly as the information that you supply will be confidentially stored in a secure location and reported in aggregate form only. Keep in mind that your responses will in no way be linked, either directly or indirectly, back to you. Your responses have no bearing on the grade that you receive for the course but will be very valuable in efforts to continue to improve the quality of the online learning experience offered through UCF. Your name will not be used in either the data analysis or results to ensure that your identity is protected.

I _____, have read the welcome statement. I understand that I am participating in this interview of my own free will and that I can cease to participate in this study at any time. I also understand that the interview portion of the study will be recorded.
Signed: _____

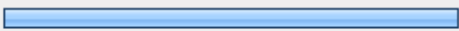# APPENDIX B. LIST OF QUESTIONS

List of Questions

1. How do you prefer to interact with other learners? (e.g., e-mail, discussion board, blog, IM/chat, etc.?)

2. How valuable were the interactions you have with other learners in the web course environment?

3. What activities did you find most beneficial within the course?

4. Thinking of all the different types of collaboration tools you use within this course, which do you think is most important to the overall success of an online course? Why?

5. Do you feel that the different types of collaboration tools that we've discussed within the online course(s) that you've completed are equal? Why/why not?

6. Is one type of collaboration tool more important than others? Could that type of collaboration tool be replaced by an increased level of others?

7. Thinking of all interactions that you had with the instructor…if they were to be diminished or even eliminated from the course, do you feel that an increase in other types of interaction would fill that void? If yes, what other types of interactions would compensate?

8. Thinking of interactions that you had with the other students in the course…if they were to be diminished or even eliminated from the course, do you feel that an increase in other types of interaction would fill that void? If yes, what other types of interactions would compensate?

9. Thinking of interaction that you had with the course content…if they were to be diminished or even eliminated from the course, do you feel that an increase in other types of interaction would fill that void. If yes, what other types of interactions would compensate?

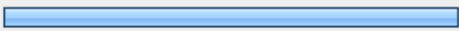# APPENDIX C. STUDENT DEMOGRAPHIC STUDY

Student Demographic Study

Student Demographic Study

<table>
<tr><td colspan="2">1. PROCEDURES - The first part of the study will involve you filling out a short, online questionnaire. We will collect some non-identifying demographic information which will help us understand you better and may provide help us understand why you prefer the online tools you choose. In the second part of the study, you may be asked to participate in a one-on-one interview. This interview can be face-to-face or can be conducted using online communication technology. This interview will be recorded and transcribed for usage within the study. After the interview has been transcribed, the recording will be destroyed. During this interview, you will be asked four main questions. Depending on your answers, there may be a few follow up questions. We do not believe that the interview should take any more than thirty minutes.</td><td>Response Percent</td><td>Response Count</td></tr>
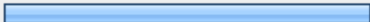<tr><td>I have read the procedures section.</td><td></td><td>100.0%</td><td>125</td></tr>
<tr><td></td><td colspan="2">answered question</td><td>125</td></tr>
<tr><td></td><td colspan="2">skipped question</td><td>0</td></tr>
</table>

<table>
<tr><td colspan="2">2. RISKS, STRESS, OR DISCOMFORT There are no risks to you in participating in this study. All we want are your opinions. OTHER INFORMATION The information we collect will be kept confidential. The information will be kept encrypted and password protected. Only those directly involved in the study will have access to the information we collect. Any students in this class can refuse to participate or may withdraw from this study at any time without penalty or loss of benefits to which you are otherwise entitled. There may be extra credit offered for participating in this study. PARTICIPATION Participation in research is entirely voluntary. You may refuse to participate or withdraw from participation at any time without jeopardizing your employment, student status or any other entitlements. The investigator may withdraw you at his/her professional discretion. PRIVATE INFORMATION Any information derived from this research project that personally identifies you will not be voluntarily released or disclosed without your separate consent, except as specifically required by law. CONTACT INFORMATION If at any time you have questions regarding the research or your participation, you should contact the investigator, Kirk Henry, who will answer all questions. His telephone number is 407-719-5290. The supervising investigator is Dr. Jeff Kaplan. He can be reached at 407-823-2041. If at any time you have comments regarding the conduct of this research or questions about your rights as a research participant, you should contact the Institutional Review Board Administrator at (407) 823-2901.</td><td>Response Percent</td><td>Response Count</td></tr>
<tr><td>I have read the privacy, participation and disclosure sections above.</td><td></td><td>100.0%</td><td>125</td></tr>
<tr><td></td><td colspan="2">answered question</td><td>125</td></tr>
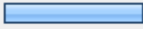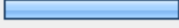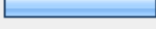<tr><td></td><td colspan="2">skipped question</td><td>0</td></tr>
</table>

3. PARTICIPANT'S STATEMENT - Please select all boxes that apply. I have read the above purpose of the study, and understand my role in participating in the research. I volunteer to take part in this research. I also understand that if I participate in the interview portion of this study, the audio of the interview will be recorded and transcribed for use within the study. I have had a chance to ask questions. If I have questions later, about the research, I can ask the investigator listed above. I understand that I may refuse to participate or withdraw from participation at any time without jeopardizing my employment, student status or other rights to which I am entitled. The investigator may withdraw me at his/her professional discretion. If I have questions about my rights as a research participant, I can call the Institutional Review Board office at (407) 823-2901. I certify that I am 18 years of age or older and freely give my consent to participate in this study. I will receive a copy of this document for my records.

		Response Percent	Response Count
I agree with the above statement and will participate in the study.		100.0%	125
I understand that if I am selected to participate in the interview portion of the study, my responses will be recorded.		80.0%	100
I will not participate in the study.		4.8%	6
	Please enter your email address for your electronic signature		123
	answered question		125
	skipped question		0

4. What is your gender?

		Response Percent	Response Count
Male		20.8%	26
Female		79.2%	99
	answered question		125
	skipped question		0
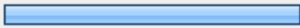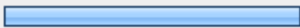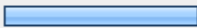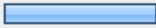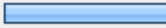
5. Into which of the following ranges does your age fall into?

		Response Percent	Response Count
18-24		**65.6%**	82
25-30		16.0%	20
31-34		4.8%	6
35-40		8.0%	10
40 or older		5.6%	7
	answered question		125
	skipped question		0

6. What is your ethnicity?

		Response Percent	Response Count
Native American or Native Alaskan		0.0%	0
Asian		3.2%	4
Black or African American but not Hispanic		10.4%	13
Hispanic		17.6%	22
White		**64.8%**	81
Other (please specify)		4.0%	5
	answered question		125
	skipped question		0

7. Including this course, how many online courses have you taken in college?		Response Percent	Response Count
1-2		29.6%	37
3-5		37.6%	47
5 or more		32.8%	41
	answered question		125
	skipped question		0

8. Which of the following selections best portrays you as an individual?		Response Percent	Response Count
I am highly energized and action-oriented. I have little need for approval and I am unconcerned with who I please. I put thinking into immediate action. I am very frank, speak out freely and I'm truthful about my feelings. I have no problem confronting people.		25.6%	32
I have a lower energy level. I don't really need approval because I'm not really concerned with pleasing others. I am independent and strong willed. Sometimes I am non-communicative. I prefer to work alone and often resist pressure from authority. I am an independent thinker.		12.8%	16
I am highly energized and productive. I like to use my high levels of energy on constructive tasks. I am strongly motivated by approval and very sensitive to the wishes of others. I Deeply value close bonds with others which may make it difficult at times to deal with direct confrontation. I do my best to create and maintain harmonious relationships. I am highly idealistic, setting lofty goals for myself.		**50.4%**	**63**
I have a lower energy level than most. I need approval because I am concerned with pleasing others. I rarely show anger or resentment and I'm very sensitive to the feelings of others. I am very compliant and loyal and tend to form strong attachments. I have a strong desire to give and receive affection.		11.2%	14
	answered question		125

		skipped question	0

9. Please consider the descriptions below and select AS MANY DESCRIPTIONS as you feel apply to you. All the behaviors in a particular description may not fit you exactly, but please pick AS MANY DESCRIPTIONS as you feel are a good fit for you. In this case, you may pick from 0-4 descriptions.

		Response Percent	Response Count
· Thinks of all possibilities and contingencies before venturing into activities · "What if" … person · May see the negative side of things · Unwilling to take risks		64.0%	80
· Highly organized and methodical · Strongly motivated to finish tasks · Perfectionistic · Tends to form habits · Extremely diligent in work habits · May be mildly ritualistic		64.0%	80
· Sometimes explosive and quick-tempered · Sharp tongued		41.6%	52
· Very frank · May act without thinking		32.8%	41
· Dramatic · May have wide mood swings · May overreact in some situations · Can have emotional outbursts · Creative thinker (rich imagination) · Artistically inclined · Devalues routine work		35.2%	44
	answered question		125
	skipped question		0

APPENDIX D. IRB APPROVAL LETTER

University of
Central Florida

Notice of Expedited Initial Review and Approval

From : **UCF Institutional Review Board**
FWA00000351, Exp. 10/8/11, IRB00001138

To : **Kirk Henry** and Co-PI: **Jeffrey S. Kaplan**

Date : **April 23, 2009**

IRB Number: **SBE-09-06198**

Study Title: **Students' perceptions of collaboration tools in a higher education online collaborative learning environment.**

Dear Researcher:

Your research protocol noted above was approved by **expedited** review by the UCF IRB Vice-chair on 4/22/2009. **The expiration date is 4/21/2010.** Your study was determined to be minimal risk for human subjects and expeditable per federal regulations, 45 CFR 46.110. The category for which this study qualifies as expeditable research is as follows:

6. Collection of data from voice, video, digital, or image recordings made for research purposes.

7. Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

The IRB has approved a **waiver of documentation of consent** for all subjects. Participants do not have to sign a consent form, but the IRB requires that you give participants a copy of the IRB-approved consent form, letter, information sheet. For online surveys, please advise participants to print out the consent document for their files.

All data, which may include signed consent form documents, must be retained in a locked file cabinet for a minimum of three years (six if HIPAA applies) past the completion of this research. Any links to the identification of participants should be maintained on a password-protected computer if electronic information is used. Additional requirements may be imposed by your funding agency, your department, or other entities. Access to data is limited to authorized individuals listed as key study personnel.

To continue this research beyond the expiration date, a Continuing Review Form must be submitted 2 – 4 weeks prior to the expiration date. Advise the IRB if you receive a subpoena for the release of this information, or if a breach of confidentiality occurs. Also report any unanticipated problems or serious adverse events (within 5 working days). Do not make changes to the protocol methodology or consent form before obtaining IRB approval. Changes can be submitted for IRB review using the Addendum/Modification Request Form. An Addendum/Modification Request Form **cannot** be used to extend the approval period of a study. All forms may be completed and submitted online at http://iris.research.ucf.edu .

Failure to provide a continuing review report could lead to study suspension, a loss of funding and/or publication possibilities, or reporting of noncompliance to sponsors or funding agencies. The IRB maintains the authority under 45 CFR 46.110(e) to observe or have a third party observe the consent process and the research.

On behalf of Tracy Dietz, Ph.D., UCF IRB Chair, this letter is signed by:

Signature applied by Joanne Muratori on 04/23/2009 10:23:10 AM EDT

IRB Coordinator

LIST OF REFERENCES

Abdulla, A. G. (2006). Distance learning students' perceptions of the online instructor roles and competencies. *Dissertation Abstracts International, 65* (07), 2409. (UMI No. 3137394)

Alexander, B. (2006). Web 2.0: A new wave of innovation for teaching and learning? *Educause Review, 41*(2), 32-44.

Allen, I. E., & Seaman, J. (2004) *Entering the mainstream: The quality and extent of online education in the United States, 2003 and 2004*. Needleham, MA: The Sloan Consortium.

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

Anderson, T. (2003). Getting the mix right again: An updated and theoretical rational for interaction. *The International Review of Research in Open and Distance Learning, 4*(2). Retrieved July 8, 2006, from http://www.irrodl.org/index.php/irrodl/article/view/149/230

Anderson, T. (2005, November). *Distance learning - social software's killer ap?* Paper presented at the 17th ODLAA Conference, Adelaide, South Australia.

Anderson, T. (2006a). Higher education evolution: Individual freedom afforded by educational social software. In M. Beaudoin (Ed.), *Perspectives on higher education in the digital age* (pp. 77-90). New York: Nova Science.

Anderson, T. (2006b). Interaction in learning and teaching on the Educational Semantic Web. In C. Juwah (Ed.), *Interactions in online education: Implications for theory and practice* (pp. 141-155). New York: Routledge.

Anderson, T., & Dron, J. (2007). Groups, networks and collectives in social software for e-learning, *2007 European Conference on E-Learning*. Copenhagen, Denmark.

Anderson, T., & Garrison, D. R. (1998). Learning in a networked world: New roles and

    responsibilities. In C. C. Gibson (Ed.), *Distance learners in higher education:*

    Institutional responses for quality outcomes (pp. 97-112). Madison, WI: Atwood.

Anderson, T., Annand, D., & Wark, N. (2005). The search for learning community in learner

    paced distance education: Or, 'Having your cake and eating it, too! *Australasian Journal*

    of Educational Technology, 21(2), 222-241. Retrieved July 7, 2006, from

    http://www.ascilite.org.au/ajet/ajet21/anderson.html

Anderson, T., Rourke, L., Garrison, D. R., & Archer, W. (2001). Assessing teaching presence in

    a computer conferencing environment. *Journal of Asynchronous Learning Networks,*

    5(2).

Andone, D., Dron, J., Pemberton, L., & Boyne, C. (2007). E-learning environments for digitally-

    minded students. *Journal of Interactive Learning Research, 18*(1), 41- 53.

Angeli, C., Valanides, N., & Bonk, C. J. (2003). Communication in a web-based conferencing

    system: The quality of computer-mediated interactions. *British Journal of Educational*

    Technology, 34(1), 31-43.

Attwell, G. (2006). Personal learning environments. Retrieved August 16, 2006, from

    http://www.knownet.com/writing/weblogs/Graham_Attwell/entries/6521819364

Attwell, G. (2007). Personal learning environments - The future of eLearning? *eLearning*

    Papers, 2(1). Retrieved March 22, 2007, from http://www.elearningpapers.eu

Aviv, R., Erlich, Z., & Ravid, G. (2005). Reciprocity analysis of online learning networks.

    Journal of Asynchronous Learning Networks, 9(4), 3-13.

Bannan-Ritland, B. (2002). Computer-mediated communication, elearning, and interactivity: A review of the research. *Quarterly Review of Distance Education, 3*(2), 141-160.

Barab, S. A., Squire, K. D., & Deuber, W. (2000). A co-evolutionary model for supporting the emergence of authenticity. *Educational Technology Research & Development, 48*(2), 37-62.

Bednar, A. K., Cunningham, D., Duffy, T. M., & Perry, J. D. (1991). Theory into practice: How do we link? In G. J. Anglin (Ed.), *Instructional technology: Past, present, and future*. Englewood, CO: Libraries Unlimited, Inc.

Beldarrain, Y. (2006). Distance education trends: Integrating new technologies to foster student interaction and collaboration. *Distance Education, 27*(2), 139-153.

Berge, Z. L. (1995). Facilitating computer conferencing: Recommendations from the field. *Educational Technology, 35*(1), 22-30.

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

Berge, Z. L. (2001). New roles for learners and teachers in online education. Retrieved February 21, 2006, from http://www.globaled.com/articles/BergeZane2000.pdf

Berners-Lee, T. (1997). *Weaving the web: The original design and ultimate destiny of the World Wide Web*. San Francisco: Harper.

generation of web-based tools for collaborative clinical practice and education. *BMC Medical Journal, 6*(41). Retrieved August 19, 2007, from http://www.biomedcentral.com/content/pdf/1472-6920-6-41.pdf

Boyd, R. D., & Myers, J. G. (1988). Transformative education. *International Journal of Lifelong Education, 7*(4), 261-284.

Brescia, W. F., & Miller, M. T. (2006). What's it worth? The perceived benefits of instructional blogging. *Electronic Journal for the Integration of Technology in Education, 5*, 44-52. Retrieved October 4, 2006, from http://ejite.isu.edu/Volume5/Brescia.pdf

Brewer, S., & Klein, J. D. (2006). Type of positive interdependence and affiliation motive in an asynchronous, collaborative learning environment. *Educational Technology Research & Development, 54*(4), 331-354.

Brockett, R. G., & Hiemstra, R. (1991). *Self-direction in adult learning: Perspectives on theory, research, and practice*. London: Routledge.

Brookfield, S. (1984). Self-directed adult learning: A critical paradigm. *Adult Education Quarterly, 35*(2), 59-71.

Brown, J. S. (2000). Growing up digital. *Change, 32*(2), 10-20.

Brown, R. E. (2001). The process of community-building in distance learning classes. *Journal of Asynchronous Learning Networks, 5*(2), 18-35.

Brown, S. W., & King, F. B. (2000). Constructivist pedagogy and how we learn: Educational psychology meets international studies. *International Studies Perspectives, 1*(3), 245-255.

Burge, L. (1988). Beyond andragogy: Some explanations for distance learning design. *Journal of Distance Education, 3*(1). Retrieved April 22, 2006, from http://cade.athabascau.ca/vol3.1/burge.html

Caffarella, R. S., & Caffarella, E. P. (1986). Self-directedness and learning contracts in adult education. *Adult Education Quarterly, 36*(4), 226-234.

Cameron, D., & Anderson, T. (2006). Comparing weblogs to threaded discussion tools in online educational contexts. *International Journal of Instructional Technology and Distance Learning, 2*(11). Retrieved December 2, 2006, from http://www.itdl.org/Journal/Nov_06/article01.htm

Chang, C. W. (2006). The efficacy of interaction among college students in a web-based environment. *Dissertation Abstracts International, 67* (05), (UMI No. 3220234)

Chang, M. M. (2005). Applying self-regulated learning strategies in a web-based instruction--An investigation of motivation perception. *Computer Assisted Language Learning, 18*(3), 217-230.

Chang, T. S. (2003). A comparison study of online interaction strategies as perceived by online learners and instructors and the effect of previous online learning experience on preferences for online interaction. *Dissertation Abstracts International, 64* (10), 3564. (UMI No. 3110339)

Charles, C. M., & Mertler, C. A. (2002). *Introduction to educational research* (4th ed.). Boston: Allyn and Bacon.

Chen, Y.-J. (2000). Transactional distance in world wide web learning environments. *Innovations in Education and Teaching International, 38*, 327-338.

Chute, A. G., Sayers, P. K., & Gardner, R. P. (1997). Networked learning environments. *Teaching and Learning at a Distance, 71*, 75-84.

Conrad, D. (2002). Deep in the hearts of learners: Insights into the nature of online community. *Journal of Distance Education, 17*(1). Retrieved March 2, 2006, from http://cade.icaap.org/vol17.1/conrad.html

125

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

Cross, J. (2006). *Informal learning: Rediscovering the natural pathways that inspire innovation and performance*. Hoboken, NJ: John Wiley & Sons.

Curtis, D. D., & Lawson, M. J. (2001). Exploring collaborative online learning. *Journal of Asynchronous Learning Networks, 5*(1), 21-34.

Daloz, L. A. (1999). *Mentor: Guiding the journey of adult learners*. San Francisco: Jossey-Bass.

Dalsgaard, C. (2006). Social software: E-learning beyond learning management systems. *European Journal of Open, Distance and E-Learning, 2006* (2). Retrieved September 26, 2006, from http://www.eurodl.org/materials/contrib/2006/Christian_Dalsgaard.htm

Danaher, P. A. (1994). Open learning and technology: Problems and potentials. *Social Alternatives, 13*(3/4), 23-26.

Daniel, J. S., & Marquis, C. (1988). Interaction and independence: Getting the mixture right. In D. Sewart, D. Keegan & B. Holmberg (Eds.), *Distance education: International perspectives* (pp. 339-359). New York: Routledge.

Dell, C. A. (2006). Emergence of self-regulation among online learners. *Academic Exchange Quarterly, 10*(4). Retrieved July 1, 2007, from http://rapidintellect.com/AEQweb/cho3572z6.htm

Dempsey, J. V., & Van Eck, R. N. (2007). Distribued learning and the field of instructional design. In R. A. Reiser & J. V. Dempsey (Eds.), *Trends and issues in instructional design and technology* (2nd ed., pp. 288-300). Upper Saddle River, NJ: Pearson.

Denzin, N. K., & Lincoln, Y. S. (Eds.). (1994). *Handbook of qualitative research*. Thousand

    Oaks, CA: Sage.

Derrida, J. (1978). *Writing and difference*. Chicago: University of Chicago Press.

Dewey, J. (1938). *Experience and education*. New York: Simon & Schuster.

Dervarics, C. (2008). Disability bill divides higher ed groups. *Diverse Online*. Retrieved

    November18, 2008, from

    http:www.diverseeducation.com/artman/publish/printer_11452.shtml

Dobrovolny, J. (2006). How adults learn from self-paced, technology-based corporate training:

    New focus for learners, new focus for designers. *Distance Education, 27*(2), 155-170.

Downes, S. (2006). Learning networks and connective knowledge. Retrieved October 16, 2006,

    from http://it.coe.uga.edu/itforum/paper92/paper92.html

Downes, S. (2007). Collaboration tools and web 2.0. Retrieved August 21, 2007, from

    http://www.downes.ca/presentation/139

Driscoll, M. P. (2006). Psychological foundations of instructional design. In R. A. Reiser & J. V.

    Dempsey (Eds.), *Trends and issues in instructional design and technology*. Upper Saddle

    River, NJ: Pearson Merrill Prentice Hall.

Dron, J. (2006a). Any color you like, as long as it's Blackboard, *E-Learn 2006*. Hawaii.

Dron, J. (2006b). Social software and the emergence of control, *The 6th IEEE International

    Conference on Advanced Learning Technologies*. Kerkrade, The Netherlands.

Dron, J. (2006c). The teacher, the learner and the collective mind. *AI & Society*.

Dron, J. (2007). Designing the undesignable: Social software and control. *Educational

    Technology & Society, 10*(3), 60-71.

Ellis, A. K. (2001). *Teaching, learning, & assessment together: The reflective classroom.* Larchmont, NY: Eye on Education.

Ellis, R. A., Jarkey, N., Mahony, M. J., Peat, M., & Sheely, S. (2007). Managing quality improvement of eLearning in a large, campus-based university. *Quality Assurance in Education, 15*(1), 9-23.

Fink, A., & Kosecoff, J. (1998). *How to conduct surveys: A step-by-step guide* (2nd ed.). Thousand Oaks, CA: Sage.

Fisher, M., & Baird, D. E. (2005). Online learning design that fosters student support, self-regulation, and retention. *Campus-Wide Information Systems, 22*(2), 88-107.

Franklin, S., Peat, M., Lewis, A., & Sims, R. (2001). *Technology at the cutting edge: A large scale evaluation of the effectiveness of educational resources.* Paper presented at the World Conference on Educational Multimedia, Hypermedia and Telecommunications.

Freire, P. (1970). *Pedagogy of the oppressed.* New York: Continuum.

Freire, P. (1994). *Education for critical consciousness.* New York: Continuum.

Friesen, N., & Anderson, T. (2004). Interaction for lifelong learning. *British Journal of Educational Technology, 35*(6), 679-687.

Fulford, C. P., & Zhang, S. (1993). Perceptions of interaction: The critical predictor in distance education. *The American Journal of Distance Education, 7*(3), 8-21.

Fung, Y. Y. H. (2004). Collaborative online learning: Interaction patterns and limiting factors. *Open Learning, 19*(2), 135-149.

Garrison, D. R. (1992). Critical thinking and self-directed learning in adult education: An analysis of responsibility and control issues. *Adult Education Quarterly, 42*, 136-148.

Garrison, D. R. (1997). Self-directed learning: Toward a comprehensive model. *Adult Education Quarterly, 48*(1), 18-33.

Garrison, D. R. (2000). Theoretical challenges for distance education in the 21st century: A shift from structural to transactional issues. *The International Review of Research in Open and Distance Learning, 1*(1). Retrieved June 4, 2007, from http://www.irrodl.org/index.php/irrodl/article/view/2/333

Garrison, D. R. (2003). Cognitive presence for effective asynchronous online learning: The role of reflective inquiry, self-direction and metacognition. In J. Bourne & J. C. Moore (Eds.), *Elements of quality online education: Practice and direction*. Needham, MA: The Sloan Consortium.

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

Garrison, D. R., & Archer, W. (2000). *A transactional perspective on teaching and learning: A framework for adult and higher education*. Amsterdam: Pergamon.

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

Garrison, D. R., Anderson, T., & Archer, W. (2001). Critical thinking, cognitive presence, and computer conferencing in distance education. *American Journal of Distance Education, 15*(1).

Garrison, D. R., Cleveland-Innes, M., & Fung, T. (2004). Student role adjustment in online

    communities of inquiry: Model and instrument validation. *Journal of Asynchronous*

    Learning Networks, 8(2), 61-74.

Gayton, J. (2007). Visions shaping the future of online education: Understanding its historical

    evolution, implications, and assumptions. *Online Journal of Distance Learning*

    Administration, 10(1). Retrieved June 21, 2007, from

    http://www.westga.edu/~distance/ojdla/summer102/gaytan102.htm

Gorsky, P., & Caspi, A. (2005). A critical analysis of transactional distance theory. *The*

    Quarterly Review of Distance Education, 6, 1-11.

Greene, H. C. (2005). Creating connections: A pilot study of an online community of learners.

    Journal of Online Interactive Learning, 3(3). Retrieved September 2, 2006, from

    http://www.ncolr.org/jiol/issues/PDF/3.3.3.pdf

Greene, J. C. (2008). Is mixed methods social inquiry a distinctive methodology? *Journal of*

    Mixed Methods Research, 2(1), 7-22.

Greene, J. C., Caracelli, V. J., & Graham, W. F. (1989). Toward a conceptual framework for

    mixed-method evaluation designs. *Educational Evaluation and Policy Analysis*, 11, 255-

    274

Grooms, L. D. (2000). Interaction in the computer-mediated adult distance learning environment:

    Leadership development through online education. *Dissertation Abstracts International,*

    61 (12), 4692. (UMI No. 9999213)

Gunawardena, C. N. (1995). Social presence theory and implications for interaction and

 collaborative learning in computer conferences. *International Journal of Educational*

 Telecomunications, 1(2/3), 147-166.

Habermas, J. (1968). *Knowledge and human interests*. Boston: Beacon Press.

Hamilton, M. (2006). Just do it: Literacies, everyday learning and the irrelevance of pedagogy.

 Studies in the Education of Adults, 38(2), 125-140.

Hannafin, M. J. (1989). Interaction strategies and emerging instructional technologies:

 Psychological perspectives. *Canadian Journal of Educational Communication, 18*(3),

 167-179.

Heath, M. J. (1997). The design, development, and implementation of a virtual online classroom.

 Dissertation Abstracts International, 58 (08), 3097. (UMI No. 9803569)

Hedberg, J., & Sims, R. (2001). Speculations on design team interactions. *Journal of Interactive*

 Learning Research, 12(2), 189-214.

Herrington, J., Reeves, T. C., & Oliver, R. (2006). A model of authentic activities for online

 learning. In *Interactions in online education: Implications for theory and practice* (pp.

 91-103). New York: Routledge.

Hewitt, J. (2005). Toward an understanding of how threads die in asynchronous computer

 conferences. *Journal of the Learning Sciences, 14*(4), 567-589.

Hillman, D. C., Willis, D. J., & Gunawardena, C. N. (1994). Learner-interface interaction in

 distance education: An extension of contemporary models and strategies for practitioners.

 The American Journal of Distance Education, 8(2), 30-42.

Hines, R. A., & Pearl, C. E. (2004). Increasing interaction in web-based instruction: Using

    synchronous chats and asynchronous discussions. *Rural Special Education Quarterly, 23*,

    33-36.

Hirumi, A. (2002). A framework for analyzing, designing, and sequencing planned elearning

    interactions. *The Quarterly Review of Distance Education, 3*(2), 141-161.

Hirumi, A. (2006). Analysing and designing e-learning interactions. In C. Juwah (Ed.),

    Interactions in online education: Implications for theory and practice (pp. 46-71). New

    York: Routledge.

Ho, C.-H. (2005). Evaluating online interaction in an asynchronous learning environment: A

    conversation analysis approach. *Dissertation Abstracts International, 66* (02), 473. (UMI

    No. 3164602)

Hodge, E., Bossé, M. J., Foulconer, J., & Fewell, M. (2006). Mimicking proximity: The role of

    distance education in forming communities of learning. *International Journal of*

    Instructional Technology & Distance Learning, 3(12). Retrieved January 14, 2007, from

    http://www.itdl.org/Journal/Dec_06/article01.htm

Hodges, C. B. (2005). Self-regulation in web-based courses: A review and the need for research.

    The Quarterly Review of Distance Education, 6(4), 375-383.

Holmberg, B. (1989). *Theory and practice of distance education*. New York: Routledge.

Irlbeck, S., Kays, E., Jones, D., & Sims, R. (2006). The Phoenix Rising: Emergent models of

    instructional design. *Distance Education, 27*(2), 171-185.

Jick, T. D. (1979, December). Mixing qualitative and quantitative methods: Triangulation in

    action. *Administrative Science Quarterly, 24*, 602-611.

Johnson, G. M. (2006). Synchronous and asynchronous text-based CMC in educational contexts: A review of recent research. *TechTrends, 50*(4), 46-53.

Johnson, H. (2007). Dialogue and the construction of knowledge in e-learning: Exploring students' perceptions of their learning while using Blackboard's asynchronous discussion board. *European Journal of Open, Distance and E-Learning, 2007*(1). Retrieved January 14, 2007, from http://www.eurodl.org/materials/contrib/2007/Henry_Johnson.htm

Johnson, R. B., & Onwuegbuzie, A. J. (2002). Mixed methods research: A research paradigm whose time has come. *Educational Researcher, 33*(7), 14-26.

Johnson, R. B., Onwuegbuzie, A. J & Turner, L. A. (2007). Toward a definition of mixed methods research. *Journal of Mixed Methods Research,* 1(2), 112-133

Jonassen, D. H. (1991). Objectivism versus constructivism: Do we need a new philosophical paradigm? *Educational Technology Research & Development, 39*(3), 5-14.

Jonassen, D. H. (1999). Designing constructivist learning environments. In C. M. Reigeluth (Ed.), *Instructional-design theories and models: A new paradigm of instructional theory* (Vol. II, pp. 115-140). Mahwah, NJ: Lawrence Erlbaum Associates.

Jones, C., & Steeples, C. (2001). *Networked learning: Perspectives and issues*. New York: Springer-Verlag.

Jones, N., & Peachey, P. (2005). The development of socilization in an on-line learning environment. *Journal of Online Interactive Learning, 3*(3). Retrieved September 2, 2006, from http://www.ncolr.org/jiol/issues/PDF/3.3.4.pdf

Jung, I., Choi, S., Lim, C., & Leem, J. (2002). Effects of different types of interaction on learning achievement, satisfaction and participation in web-based instruction. *Innovations in Education and Teaching International, 39*(2), 153-162.

Juwah, C. (2006). Introduction. In C. Juwah (Ed.), *Interactions in online education: Implications for theory and practice* (pp. 1-5). New York: Routledge.

Kahn, B. H. (1997). *Flexible learning in an information society*. Hershey, PA: Information Science Publishing.

Kanuka, H., & Garrison, D. R. (2004). Cognitive presence in online learning. *Journal of Computing in Higher Education, 15*(2), 30-48.

Kays, E., & Sims, R. (2006). Reinventing and reinvigorating instructional design: A theory for emergent learning. In L. Markauskaite, P. Goodyear & P. Reimann (Eds.), *Proceedings of the 23rd annual conference of the Australasian Society for Computers in Learning in Tertiary Education: Who's Learning? Whose Technology?* (pp. 409-412). Sydney: Sydney University Press.

Ke, F., & Carr-Chellman, A. (2006). Solitary learner in online collaborative learning: A disappointing experience? *The Quarterly Review of Distance Education, 7*(3), 249-265.

Keegan, D. (1996). *Foundations of distance education* (3rd ed.). New York: Routledge.

Keenan, C. (2002). *Successful strategies: Collaborative learning for blended courses.* Paper presented at the World Conference on E-Learning in Corp, Govt., Health & Higher Ed.

Khan, B. H. (Ed.). (1997). *Web-based instruction*. Englewood Cliffs, NJ: Educational Technology Publications.

Kirschner, P. A., Sweller, J., & Clark, R. E. (2006). Why minimal guidance during instruction does not work: An analysis of the failure of constructivist, discovery, problem-based, experiential, and inquiry-based teaching. *Educational Psychologist, 41*(1).

Klein, J. D., Spector, J. M., Grabowski, B. L., & Teja, I. (2004). *Instructor competencies: Standards for face-to-face, online, and blended settings*. Greenwich, CT: Information Age.

Knowles, M. S. (1975). *Self-directed learning: A guide for learners and teachers*. Chicago: Associated Press Follet.

Knowles, M. S. (1980). *The modern practice of adult education: From pedagogy to andragogy*. Englewood Cliffs, NJ: Cambridge Adult Education.

Knowles, M. S. (1990). *The adult learner: A neglected species* (4th ed.). Houston, TX: Gulf.

Knowles, M. S., & Associates. (1984). *Andragogy in action: Applying modern principles of adult education*. San Francisco: Jossey Bass.

Konieczny, P. (2007). Wikis and Wikipedia as a teaching tool. *International Journal of Instructional Technology & Distance Learning, 4*(1). Retrieved April 3, 2007, from http://www.itdl.org/Journal/Jan_07/article02.htm

Koszalka, T. A., & Ganesan, R. (2004). Designing online courses: A taxonomy to guide strategic use of features available in course management systems (CMS) in distance education. *Distance Education, 25*(2), 243-256.

Laurillard, D. (1993). *Rethinking university teaching - A framework for the effective use of educational technology,* London: Routledge.

Lee, J., & Gibson, C. C. (2003). Developing self-direction in an online course through computer-mediated interaction. *The American Journal of Distance Education, 17*(3), 173-187.

Lee, J., Carter-Wells, J., Glaeser, B., Ivers, K., & Street, C. (2006). Facilitating the development of a learning community in an online graduate program. *The Quarterly Review of Distance Education, 7*(1), 13-33.

Leedy, P. D., & Ormrod, J. E. (2001). *Practical research: Planning and design* (7th ed.). Upper Saddle River, NJ: Prentice Hall.

Lim, C. P. (2004). Engaging learners in online learning environments. *TechTrends, 48*(4), 16-23.

Liu, X., Bonk, C. J., Magjuka, R. J., Lee, S.-h., & Su, B. (2005). Exploring four dimensions of online instructor roles: A program level case study. *Journal of Asynchronous Learning Networks, 9*(4), 29-48.

Livingstone, D. (2000). *Exploring the icebergs of adult learning: Findings of the first Canadian survey of informal learning practices. NALL working paper no. 10.* Unpublished manuscript.

Lodico, M. G., Spaulding, D. T., & Voegtle, K. H. (2006). *Methods in educational research: From theory to practice*. San Francisco: Jossey-Bass.

Lyotard, J. F. (1984). *The postmodern condition: A report on knowledge*. Minneapolis: University of Minnesota Press.

Lyotard, J. F. (1992). *The postmodern explained*. Sydney, Australia: Power Publications.

Mann, S. J. (2005). Alienation in the learning environment: A failure of community? *Studies in Higher Education, 30*(1), 43-55.

Maor, D. (2003). The teacher's role in developing interaction and reflection in an online learning community. *Educational Media International, 40*(1/2), 127-138.

Martens, R., Bastiaens, T., & Kirschner, P. A. (2007). New learning design in distance education: The impact on student perception and motivation. *Distance Education, 28*(1), 81-93.

Martindale, T., & Wiley, D. A. (2005). Using weblogs in scholarship and teaching. *TechTrends, 49*(2), 55-61.

Marton, F. (1988). Phenomenography: Exploring different conceptions of reality. In D. M. Fetterman (Ed.), *Qualitative approaches to evaluation in education: The silent scientific revolution* (pp. 176-205). New York: Praeger.

Mayer, R. (2004). Should there be a three-strikes rule against pure discover learning? The case for guided methods of instruction. *American Psychologist, 59*(1), 14-19.

McAuliffe, G., and Lovell, C. (2000). Encouraging transformation: Guidelines for constructivist and developmental instruction. In G. McAuliffe and K. Eriksen (Eds.) *Preparing counselors and therapists: Creating constructivist and developmental programs*, pp. 14–41. Alexandria, VA: Association for Counselor Education and Supervision.

McConnell, D. (2005). Examining the dynamics of networked e-learning groups and communities. *Studies in Higher Education*, 30(1), 25-42

McDaniel, S. N. (2003). Faculty variables that influence effectiveness of online classes. *Dissertation Abstracts International, 64* (12), 4341. (UMI No. 3116154)

McIsaac, M. S., Blocher, J. M., Mahes, V., & Vrasidas, C. (2002). Student and teacher perceptions of interaction in online computer-mediated communication. *Educational Media International, 36*(2), 121-131.

McLaughlin, K. D. (2004). Toward a new paradigm for teaching and learning: A case study of the process of integrating instructional design and technology at Florida Community College at Jacksonville. *Dissertation Abstracts International, 65* (10), 3667. (UMI No. 3150697)

McMillan, J. H., & Schumacher, S. (2006). *Research in education: Evidence-based inquiry* (6th ed.). Boston: Pearson.

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.

Mehanna, W. N. (2004). e-Pedagogy: The pedagogies of e-learning. *Research in Learning Technology, 12*(3), 279-293.

Merriam, S. B. (2001). Andragogy and self-directed learning: Pillars of adult learning theory. In S. B. Merriam (Ed.), *The new update on adult learning theory: New directions for adult and continuing education* (pp. 3-11). San Francisco: Jossey-Bass.

Merriam, S. B., & Caffarella, R. S. (1999). *Learning in adulthood: A comprehensive guide* (2nd ed.). San Francisco: Jossey-Bass.

Meyer, K. A. (2004). Evaluating online discussions: Four different frames of analysis. *Journal of Asynchronous Learning Networks, 8*(2), 101-114.

Meyer, K. A. (2005). The ebb and flow of online discussions: What Bloom can tell us about our students' conversations. *Journal of Asynchronous Learning Networks, 9*(1), 53-63.

Mezirow, J. (1991). *Transformative dimensions of adult learning*. San Francisco: Jossey-Bass.

Mezirow, J. (1997). Cognitive processes: Contemporary paradigms of learning. In P. Sutherland (Ed.), *Adult learning: A reader*. Sterling, VA: Kogan Page.

Mezirow, J. (2000). Learning to think like an adult: Core concepts of transformation theory. In J. Mezirow & Associates (Eds.), *Learning as transformation: Critical perspectives on a theory in progress*. San Francisco: Jossey-Bass.

Mimirinis, M., & Bhattacharya, M. (2007). Design of virtual learning environments for deep learning. *Journal of Interactive Learning Research, 18*(1), 55-64.

Moller, L., Prestera, G., Harvey, D., Downs-Keller, M., & McCausland, J. (2002). Creating an organic knowledge--Building environment within an asynchronous distributed learning context. *Quarterly Review of Distance Education*, *3*(1), 59. Retrieved January 27, 2009, from Professional Development Collection database.

Monson, J. A. (2003). The importance of human interaction in online learning: Learner and instructor perceptions and expectations. *Dissertation Abstracts International, 64* (06), 1959. (UMI No. 3094140)

Moore, M. G. (1986). Self-directed learning and distance education. *Journal of Distance Education, 1* (1). Retrieved March 24, 2007, from http://cade.athabascau.ca/vol1.1/moore.html

Moore, M. G. (1989). Editorial: Three types of interaction. *American Journal of Distance Education, 3*(2), 1-7.

Moore, M. G. (1993). Three types of interaction. In K. Harry, M. John & D. Keegan (Eds.),

    Distance education: New perspectives (pp. 19-24). New York: Routledge.

Ng, K. C. (2007). Replacing face-to-face tutorials by synchronous online technologies:

    Challenges and pedagogical implications. *The International Review of Research in Open*

    and Distance Learning, 8(1). Retrieved June 15, 2007, from

    http://www.irrodl.org/index.php/irrodl/article/view/335

Noble, D. F. (2001). *Digital diploma mills: The automation of higher education*. New York:

    Monthly Review Press.

Northrup, P. T. (2002). Online learners' preferences for interaction. *The Quarterly Review of*

    Distance Education, 3(2), 219-226.

Oladoke, A. O. (2006). Measurement of self-directed learning in online learners. *Dissertation*

    Abstracts International, 67 (01), (UMI No. 3206369)

Onwuegbuzie, A. J., & Leech, N. L. (2005). On becoming a pragmatic researcher: The

    importance of combining quantitative and qualitative research methodologies.

    International Journal of Social Research Methodology, 8(5), 375-387.

Orellana, A. (2006). Class size and interaction in online courses. *The Quarterly Review of*

    Distance Education, 7(3), 229-248.

Ormrod, J. E. (1999). *Human learning* (3rd ed.). Upper Saddle River, NJ: Merrill.

Ortiz-Rodriguez, M., Telg, R. W., Irani, T., Roberts, T. G., & Rhoades, E. (2005). College

    students' perceptions of quality in distance education: The importance of communication.

    Quarterly Review of Distance Education, 6(2), 97-105.

Palloff, R. M., & Pratt, K. (1999). *Building learning communities in cyberspace: Effective strategies for the online classroom*. San Francisco, CA: Jossey-Bass.

Palloff, R. M., & Pratt, K. (2003). *The virtual student: A profile and guide to working with online learners*. San Francisco, CA: Jossey-Bass.

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

Patton, M. Q. (1990). *Qualitative evaluation and research methods* (2nd ed.). Newbury Park, CA: Sage.

Paulsen, M. F. (1993). The hexagon of cooperative freedom: A distance education theory attuned to computer conferencing. *Distance Education Online Symposium, 3*(2). Retrieved February 14, 2007, from http://www.nettskolen.com/forskning/21/hexagon.html

Pawan, F., Paulus, T. M., Yalcin, S., & Chang, C. (2003). Online learning: Patterns of engagement and interactions among in-service teachers. *Language Learning & Technology, 7*(3), 119-140.

Perry, B., & Edwards, M. (2005). Exemplary online educators: Creating a community of inquiry. *Turkish Online Journal of Distance Education, 6*(2).

Piaget, J. (1969). *The mechanisms of perception*. New York: Routledge Kegan Paul.

Picciano, A. G. (2002). Beyond student perceptions: Issues of interaction, presence, and performance in an online course. *Journal of Asynchronous Learning Networks, 6*(1), 21-40.

Piskurich, G. M. (1993). *Self-directed learning: A practical guide to design, development, and implementation*. San Francisco: Jossey-Bass.

141

Prammanee, N. (2005). Understanding participation in online courses: A case study of online interaction. *Dissertation Abstracts International, 66* (04), 1267. (UMI No. 3173595)

Ramsden, P. (1992). *Learning to Teach in Higher Education.* London: Routledge.

Restauri, S. L. (2006). Faculty-student interaction components in online education: What are the effects on student satisfaction and academic outcomes? *Dissertation Abstracts International, 67* (01), 602. (UMI No. 3206695)

Rhode, J. F. (2006). Anatomy of a socially-constructed self-paced learning environment. Retrieved August 20, 2007, from http://www.idolresources.com/?p=416

Richardson, J. C., & Newby, T. (2006). The role of students' cognitive engagement in online learning. *American Journal of Distance Education, 20*(1), 23-37.

Richardson, J. C., & Swan, K. (2003). Examining social presence in online courses in relation to students' perceived learning and satisfaction. *Journal of Asynchronous Learning Networks, 7*(1), 68-88.

Roberts, B. (2002). Interaction, reflection and learning at a distance. *Open Learning, 17*(1), 39-55.

Roblyer, M. D., & Wiencke, W. R. (2003). Design and use of a rubric to assess and encourage interactive qualities in distance courses. *American Journal of Distance Education, 17*(2), 77-99.

Roblyer, M. D., & Wiencke, W. R. (2004). Exploring the interaction equation: Validating a rubric to assess and encourage interaction in distance courses. *Journal of Asynchronous Learning Networks, 8*(4).

Rogers, C. R. (1969). *Freedom to learn*. Columbus, OH: Charles E. Merrill.

Rourke, L., & Anderson, T. (2002a). Exploring social interaction in computer conferencing. *Journal of Interactive Learning Research, 13*(3), 257-273.

Rourke, L., & Anderson, T. (2002b). Using peer teams to lead online discussion. *Journal of Interactive Media in Education,1* (1), 2.

Rourke, L., Anderson, T., Garrison, D. R., & Archer, W. (1999). Assessing social presence in text-based computer conferencing. *Journal of Distance Education, 14*(3), 51-70.

Rovai, A. P. (2002). Building a sense of community at a distance. *International Review of Research in Open and Distance Learning, 3*(1).

Rovai, A. P., & Barnum, K. T. (2003). On-line course effectiveness: An analysis of student interactions and perceptions of learning. *Journal of Distance Education, 18*(1). Retrieved March 17, 2007, from http://cade.athabascau.ca/vol18.1/rovai.pdf

Russell, T. L. (2005). No significant difference phenomenon. Retrieved December 5, 2005, from http://www.nosignificantdifference.org

Russo, T. C., & Benson, S. (2005). Learning with invisible others: Perceptions of online presence and their relationship to cognitive and affective learning. *Educational Technology & Society, 8*(1), 54-62.

Russo, T. C., & Campbell, S. W. (2004). Perceptions of mediated presence in an asynchronous online course: Interplay of communication behaviors and medium. *Distance Education, 25*(2), 215-232.

Saba, F. (2000). Research in distance education: A status report. *The International Review of Research in Open and Distance Learning, 1*(1), 1-9. Retrieved November 21, 2006, from http://www.irrodl.org/index.php/irrodl/article/view/4

Saba, F., & Shearer, R. L. (1994). Verifying key theoretical concepts in a dynamic model of

distance education. *The American Journal of Distance Education, 8*(1), 36-57.

Salmon, G. (2003). *E-moderating: The key to teaching and learning online*. London:

RoutledgeFalmer.

Sechrest, L., & Sidana, S. (1995). Quantitative and qualitative methods: Is there an alternative?

Evaluation and Program Planning, 18, 77-87.

Selwyn, N., Gorard, S., & Furlong, J. (2006). Adults' use of computers and the Internet for self-

education. *Studies in the Education of Adults, 38*(2), 141-159.

Shea, P. J., Li, C., Swan, K., & Pickett, A. (2005). Developing learning community in online

asynchronous college courses: The role of teaching presence. *Journal of Asynchronous

Learning Networks, 9*(4), 59-82.

Sher, A. (2004). Assessing the relationships of student-instructor and student-student interaction

with student learning and satisfaction in Web-based distance learning programs.

Dissertation Abstracts International, 65 (03), 903. (UMI No. 3126415)

Siemens, G. (2004). Connectivism: A learning theory for the digital age. Retrieved November

11, 2006, from http://www.elearnspace.org/Articles/connectivism.htm

Sims, R. (1999). Interactivity on stage: Strategies for learner-designer communication.

Australian Journal of Educational Technology, 15(3), 257-272. Retrieved July 8, 2006,

from http://www.ascilite.org.au/ajet/ajet15/sims.html

Sims, R. (2000). An interactive conundrum: Constructs of interactivity and learning theory.

Australian Journal of Educational Technology, 16(1), 45-57. Retrieved December 2,

2006, from http://www.ascilite.org.au/ajet/ajet16/sims.html

Sims, R. (2003). Promises of interactivity: Aligning learner perceptions and expectations with strategies for flexible and online learning. *Distance Education, 24*(1), 87-103.

Sims, R., & Bovard, B. 2004. Interacting with online learners: How new elaborations of online presence can foster critical thinking and reflection. In R. Atkinson, C. McBeath, D. Jonas-Dwyer, & R. Phillips (Eds.), *Beyond the comfort zone: Proceedings of the 21st ASCILITE Conference* (pp. 841-850). Retrieved December 5, 2008 from http://www.ascilite.org.au/conferences/perth04/procs/sims.html

Sims, R., & Salter, D. (2006). Blogging for learning: Integrating social networks for staff development. In L. Markauskaite, P. Goodyear & P. Reimann (Eds.), *Proceedings of the 23rd annual conference of the Australasian Society for Computers in Learning in Tertiary Education* (pp. 775-778). Sydney, Australia: Sydney University Press.

Sims, R., & Stork, E. (2007). Design for contextual learning: Web-based environments that engage diverse learners. In J. Richardson & A. Ellis (Eds.), *Proceedings of AusWeb07*. Lismore, NSW: Southern Cross University.

Smith, M. K. (2005). 'Andragogy', the encyclopedia of information education. Retrieved April 20, 2006, from http://www.infed.org/lifelonglearning/b-andra.htm

Song, L., & Hill, J. R. (2007). A conceptual model for understanding self-directed learning in online environments. *Journal of Online Interactive Learning, 6*(1), 27-37.

Stein, D. S., Wanstreet, C. E., Calvin, J., Overtoom, C., & Wheaton, J. E. (2005). Bridging the transactional distance gap in online learning environments. *The American Journal of Distance Education, 19*(2), 105-118.

Strachota, E. M. (2003). Student satisfaction in online courses: An analysis of the impact of

    learner-content, learner-instructor, learner-learner and learner-teacher interaction.

    Dissertation Abstracts International, 64 (08), 2746. (UMI No. 3100902)

Su, B. (2006). Experiences of and preferences for interactive instructional activities in online

    learning environment. *Dissertation Abstracts International, 67* (04), (UMINo. 3215221)

Su, B., Bonk, C. J., Magjuka, R. J., Liu, X., & Lee, S. H. (2005). The importance of interaction

    in web-based education: A program-level case study of online MBA courses. *Journal of

    Interactive Learning Research, 4*(1), 1-19.

Sutton, L. A. (2000). Vicarious interaction in a course enhanced through the use of computer-

    mediated communication. *Dissertation Abstracts International, 61* (06), 2272. (UMI No.

    9976346)

Swan, K. (2002). Building learning communities in online courses: The importance of

    interaction. *Education, Communication & Leadership, 2*(1), 23-49.

Swan, K., & Shih, L. F. (2005). On the nature and development of social presence in

    onlinecourse discussions. *Journal of Asynchronous Learning Networks, 9*(3), 115-136.

Sweller, J. (2003). Evolution of human cognitive architecture. In B. Ross (Ed.), *The psychology

    of learning and motivation* (Vol. 43, pp. 215-266). San Diego, CA: Academic Press.

Tan, S. H. S. (2006). Social networks in online learning environments. *Dissertation Abstracts

    International, 67* (05), (UMI No. 3216179)

Tashakkori, A., & Teddlie, C. (1998). *Mixed methodology: Combining qualitative and

    quantitative approaches*. Thousand Oaks, CA: Sage.

Tashakkori, A., & Teddlie, C. (Eds.). (2003). *Handbook of mixed methods in social and behavioral research*. Thousand Oaks, CA: Sage.

Taylor, J. C. (2001, April). *Fifth generation distance education*. Keynote presentation at the 20th ICDE World Conference, Düsseldorf, Germany.

Teddlie, C., & Tashakkori, A. (2003). Major issues and controversies in the use of mixed methods in the social and behavioral sciences. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of mixed methods in social and behavioral research* (pp. 3-50). Thousand Oaks, CA: Sage.

Topper, A. (2005). Facilitating student interactions through discursive moves: An instructor's experience teaching online graduate courses in educational technology. *The Quarterly Review of Distance Education, 6*(1), 55-67.

Tosh, D., & Werdmuller, B. (2004). Creation of a learning landscape: Weblogging and social networking in the context of e-portfolios. Retrieved August 2, 2006, from http://www.eradc.org/papers/Learning_landscape.pdf

Tough, A. M. (1979). *The adult's learning projects: A fresh approach to theory and practice in adult learning* (2nd ed.). Austin, TX: Learning Concepts.

Tu, C.-H. (2005). From presentation to interaction: New goals for online learning technologies. *Educational Media International, 42*(3), 189-206.

Tu, C.-H., & Corry, M. (2003). Designs, management tactics, and strategies in asynchronous learning discussions. *The Quarterly Review of Distance Education, 4*(3), 303-315.

Tusting, K. (2003). *A review of theories of informal learning. Lancaster Literacy Research Centre working paper no 2*. Unpublished manuscript.

Twigg, C. A. (2003). Improving Learning and reducing costs: New models for online learning. *Educause Review, 38*(5), 28-38.

Varvel, V. E. (2007). Master online teacher competencies. *Online Journal of Distance Learning Administration, 10*(1). Retrieved June 21, 2007, from http://www.westga.edu/~distance/ojdla/spring101/varvel101.htm

Vonderwell, S., & Zachariah, S. (2005). Factors that influence participation in online learning. *Journal of Research on Technology in Education, 38*(2), 213-230.

Vrasidas, C. (2000). Constructivism versus objectivism: Implications for interaction, course design, and evaluation in distance education. *International Journal of Educational Telecomunications, 6*(4), 339-362.

Wagner, E. D. (1994). In support of a functional definition of interaction. *The American Journal of Distance Education, 8*(2), 6-29.

Wagner, E. D. (1997). Interactivity: From agents to outcomes. *New Directions for Teaching and Learning, 71*, 19-26.

Waits, T., & Lewis, L. (2003) Distance education at degree-granting postsecondary institutions: 2000-2001. [Electronic version]. Retrieved June 5, 2005, from http://nces.ed.gov/pubs2003/2003017.pdf

Wallace, R. M. (2003). Online learning in higher education: A review of research on interactions among teachers and students. *Education, Communication and Information, 3*(2), 241-280.

Wang, H., Gould, L., & Fulton, D. (2007). Bridge the virtual gap: Using new technology to enhance interaction in distance learning. *International Journal of Instructional Technology and Distance Learning, 4*(3). Retrieved April 21, 2007, from http://www.itdl.org/Journal/Mar_07/article05.htm

Watson, J. B. (1930). *Behaviorism*. Chicago: University of Chicago Press.

Wedemeyer, C. A. (1971). Independent study. In R. Deighton (Ed.), *Encyclopedia of Educatioin IV* (pp. 548-557). New York: McMillan.

Wegerif, R. (1998). The social dimension of asynchronous learning networks. *Journal of Asynchronous Learning Networks, 2*(1), 34-49.

West, R. E., Waddoups, G. L., Kennedy, M. M., & Graham, C. R. (2007). Evaluating the impact on users from implementing a course management system. *International Journal of Instructional Technology and Distance Learning, 4*(2). Retrieved April 6, 2007, from http://itdl.org/Journal/Feb_07/article01.htm

West, R. E., Wright, G., Gabbitas, B., & Graham, C. R. (2006). Reflections from the introduction of blogs and RSS feeds into a preservice instructional technology course. *TechTrends, 50*(4), 54-60.

Whipp, J. L., & Chiarelli, S. (2004). Self-regulation in a web-based course: A case study. *Educational Technology Research & Development, 52*(4), 5-22.

Willging, P. A., & Johnson, S. D. (2004). Factors that influence students' decision to dropout of online courses. *Journal of Asynchronous Learning Networks, 8*(4), 105-118.

Williams, M. F., III. (2003). A comparative study on transforming an education graduate degree

    program from traditional classroom instruction to online-based instruction. *Dissertation*

    Abstracts International, 64 (07), 2409. (UMI No. 3099282)

Williams, P. E., & Hellman, C. M. (2004). Differences in self-regulation for online learning

    between first- and second-generation college students. *Research in Higher Education,*

    45(1), 71-82.

Wilson, S., Liber, O., Beauvoir, P., Milligan, C., Johnson, M., & Sharples, P. (2006). Personal

    learning environments: Challenging the dominant design of educational systems.

    Retrieved October 31, 2006, from http://hdl.handle.net/1820/727

Zimmerman, B. J. (1989). A social cognitive view of self-regulated academic learning. *Journal*

    of Educational Psychology, 81(3), 329-339.