

DIGITAL COMMUNICATION APPLICATIONS
IN THE
ONLINE LEARNING ENVIRONMENT

By

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IN THE
ONLINE LEARNING ENVIRONMENT

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CHAPTER I

INTRODUCTION

The ultimate goal of online education is to provide experiences to students that lead to meaningful learning (West & West, 2009, p. 21).

Distance education continues to grow in the United States and across the world. As universities are offering more online courses the issue becomes how to enhance the online learning environment (Bryceson, 2007). In 2004 almost 1.6 million students were enrolled in online courses (Allen & Seaman, 2004) and by 2008 that number had doubled to nearly four millions students (Kupczynski, Ice, Wiesenmyer, & McCluskey, 2010). Some educators believe if the trends continue it is “just a matter of time before distance education becomes the dominant form of teaching and learning” (Saba, 2005, p. 257). With the demand for online courses increasing rapidly, the need is critical to develop effective online instructional methods (Palloff & Pratt, 2007) and as the use of emerging technology continues to be incorporated into online courses the use of the technology needs to be explored (Valetsianos, 2010).

Online education scholars believe that in order for students to be effective in an online learning environment, interaction is important (Conrad & Donaldson, 2004; Draves, 2000; Kearsley, 2000; Palloff & Pratt, 1999, 2001, 2005, 2007; Sims, Dobbs, & Hand, 2002; West & West, 2009), but can be hard to cultivate. Therefore, in order to gain significant learning experiences in the online learning environment, online class instructors need to incorporate various ways for students to be able to interact with one another (Bryceson, 2007). Digital communication applications may be used to assist in creating interaction in the online learning environment. Digital communication applications are various types of technology platforms that allow students to both interact with one another via the Internet through asynchronous (interactions which provide staggered communication) or synchronous (interactions which provide real time communication). “Web 2.0 and social software tools have tremendous potential to help address or alleviate many of the aforementioned problems and barriers of distance education, including those related to teacher contact and student support” (Lee & McLoughli, 2010, p. 69). There are various types of digital communication applications that provide both asynchronous and synchronous interactions. The use of Wikis, VoiceThread and a Blog allows for asynchronous social interaction through the use of discussion boards where students are able to post and reply to other students’ messages. The use of Skype, TokBox and Wimba allows for synchronous social interaction through the use of real time communication.

Even with different types of digital communication applications available for online courses, some educators still remain skeptical of the instructional methods online courses provide. Of the educators who have taught in the online learning environment only about half believe that online courses are as good as traditional face-to-face courses (Benton, 2009).

One reason for their skepticism is because the old technology is already integrated into the culture of the current learning system, so educators do not look at how the new technology can be effectively incorporated into courses to increase the quality of the learning process (Lick & Kaufman, 2005). Although there are various types of digital communication applications, many online class instructors only use the technology available to them from the university and do not research additional communication applications available for online courses. For educators to view online courses as equivalent to face-to-face teaching, they must look at the various ways to transmit information that promotes learning in the online learning environment by using different types of technology to assist in meeting the course's learning objectives.

Throughout my academic career, I have taken various types of traditional and distant education courses. Although each of the distant education courses I took was designed differently, the only mode of digital communication used for each course was the standard university's course management system (CMS). Most universities require online class instructors to use the same CMS in order to provide a look of continuity among all courses, but the way each online class instructor incorporated the functions of the CMS into the course differed, with some online class instructors being more effective than others. For example, some of the online class instructors attached documents, links to websites and other relevant materials to the course site, while other online class instructors only used the standard features such as the discussion board and calendar, without providing supplemental materials to the course site.

The most beneficial online courses to me were designed to be learner-centered, allowing more options for students. In the learner-centered courses, the online class

instructor would post a variety of discussion questions and would allow the students to select which questions they wanted to answer. This allowed the student to interact with others on the topics of their choice as well as learn from others by reading the discussions on the other topics. This is in contrast to the teacher-centered courses in which the online class instructors posted PowerPoint presentations and had quizzes at the end of each week. In one particular course, the online class instructor posted a set of questions in advance and did not participate in the online discussion for the rest of the semester. Although it was interesting to see what others posted, sometimes the topics were irrelevant to the class. Also, it became confusing on what was factual because false information was posted and the postings were not monitored for accuracy.

Overall, all of the online courses were beneficial, but I quickly realized that my learning style was more conducive to a traditional learning environment than an online learning environment. Although my personal learning style and teaching philosophy are informed by the theory of constructivism, my online learning experiences made it difficult for me to construct the knowledge in the online courses due to the lack of social interaction that I needed to best understand the content of the course. Howland and Moore (2002) note that the student's experience is a contributor in students' attitudes toward online courses.

Students who had positive attitudes about their online experiences exhibited attributes of constructivist learners, including self-direction. Students with negative attitudes seemed less able to understand the course content and to trust self-assessment of their learning and reported the need for more guidance (Howland & Moore, 2002, p. 1).

Since students' perceptions of online courses play a role in the students' experiences of the course, research needs to explore students' perceptions of the use of digital communication applications in the online learning environment.

Although I teach in higher education, I have not taught an online course but was asked to design an online course the semester I was collecting data for the study. Having taken online courses as a student, I began to think of different ways online class instructors might be able to teach online classes that would engage students through social interactions. I began to explore how online class instructors design their courses and how they use various digital communication applications to create learner-centered online learning environments. In spring 2010, I attended a university showcase of all the new online courses that were going to be offered in the fall semester. Throughout the showcase many of the online class instructors discussed the use of new digital communication applications they were planning to use in their online courses. One of the online class instructors for a Speech course intended to use an avatar for herself and planned to have each student create avatars based on their own personalities. Students would use their avatars in their first speech as a way for others to get to know them. Another online class instructor for a language course intended to use Skype as a way for students to be able to speak to one another throughout the semester instead of just having students write to one another on the discussion board. Looking at the various course designs, I began to wonder how online class instructors determine what type of digital communication application is best for their course and how students perceive online courses that use these various digital communication applications, with or without the use of the standard university's CMS.

In order to gain better insight and to become familiar with the design of online courses at the university, I participated in the University's Office of Online Learning, 2010 Fall Distance Educators Online Course Design Workshop and the 2011 Spring Distant Educators Online Course Facilitation Workshop and in the summer of 2011 began to design an online course. Before any new online course is taught at the university, all faculty members are required to go through both of the semester long workshops. These workshops are designed to assist all faculty members at the university in overcoming the various obstacles with online teaching and effective course creation. Although a faculty member might have created and taught one online course in the past, the faculty member will have to go through the design workshop for any new online courses being designed. For the fall semester the workshop included four meetings: the first meeting was an orientation and was conducted via Wimba, a digital communication application that is created as a real-time, live virtual classroom delivered via the Internet; the second and third meetings were to discuss course design and were held on the university's campus; and, the fourth meeting was the "Course Showcase", where all the workshop participants, the Provost, Deans and Department Chairs attended. Because I was not designing a course, I worked with other participants on the design of their courses during the workshop. The experience provided me with an overview of the information within the context that online class instructors receive when they are designing their online course.

In the summer of 2011, I was asked to design an online course for a case study course. In designing the course, I participated in the Summer 2011 Distance Educators Online Course Design Workshop. The workshop ran from April 2011 to August 2011. For the workshop each participant attended two general sessions; four mini sessions of their

choice of topic; and had to complete ten modules of various assignments including how to make instructor-made videos for the course. This opportunity allowed me to explore the various applications online class instructors have available to them as well as how to incorporate them into the online course.

The use of technology with online learning offers different opportunities to increase the effectiveness and the efficiency of the learning process (Lick & Kaufman, 2005). Due to continuously changing technology and the lack of research on the online learning environment, when designing online courses some online class instructors simply try to convert their classroom face-to-face material to online material, known as “curriculum conversion,” and do not consider the difference in the transmission of information for their online courses (Akdemir & Koszalka, 2008; Palloff & Pratt, 2007). The notion of curriculum conversion can be seen as Morphey (2005) compares how constructivist strategies used in the traditional setting may be converted into the online setting (See Table 1).

Table 1

Comparison of Constructivist Strategies in Traditional Settings and Web-Based Settings

Constructivist Strategies	Traditional Settings	Web-Based Settings
Journaling	Paper and pencil, or word processed documents read aloud in class	Word-processed document posted on bulletin board for classmates to review
Analogies and Metaphors	Presented in lecture by teacher	Posted by teacher in course content on Web
Hypothesis Making and Testing	Students work cooperatively to make an informed hypothesis and conclusion	A Web quest is used either individually or cooperatively to make an informed hypothesis and conclusion
3D Models	Physical models constructed by students	Computer simulations used or created by students
Concept Maps and Semantic Maps	Co-created in classroom on whiteboard	Co-created using synchronized computer whiteboard
Graphic Organizers	Created by students and presented to class	Created by students and presented to classmates via Web presentation tools
Integrated Themes	Class discussion and lecture	Web quest used to hyperlink various sites
Portfolios	Bounded version created and maintained by students	Electronic version created and maintained by students or campus system
Dialogue and Cooperative Learning	Discussion and cooperative group learning in class	Discussion, using discussion tools or chat rooms, and cooperative group projects submitted for class review
Learning Cycle Lesson	Labs carried out using cooperative groups	Simulations used for presentation of phenomenon with cooperative input using discussion, chat, or presentation tools

Note: Adapted from "Constructivist Teaching and Learning in a Web-Based Environment." by V. N. Morphey, 2005, In C. Howard, J. Boettcher, L. Justice, K., Schenk, P.L. Rogers, & G.A. Berg (Eds). Encyclopedia of distance education. 1, 394-399. Copyright 2005 by Idea Group Inc.

Although the learning tactics in Table 1 use constructivist strategies, the curriculum conversion methods do not take into consideration the difference in the transmission of information between traditional and web-based settings.

Although online class instructors are able to convert their classroom strategies, such as journaling, graphic organizers and portfolios, it must be determined if the conversion is effective and efficient in meeting the learning objectives. For example, if a student in a traditional classroom setting reads a journal aloud in class, does that meet the same learning objectives as students posting their journal entry onto the discussion board in the online course? Another challenge with curriculum conversion is with student presentations since students may be in various time zones and the transmission of information is different over the Internet. In converting students' presentations from the traditional classroom to the online classroom, the online class instructor would need to take into consideration: the amount of time needed; what time all students would be available; if students can effectively present the "graphic organizers" via web presentation tools if they are using visual components such as PowerPoint slides, videos or links to various websites; and whether the students might be required to have additional hardware such as a webcam. By simply converting curriculum from a traditional course to an online course students might not receive the same type of learning outcomes.

Educators who teach both traditional and online classes need to determine if one should convert a strategy or use the same strategy for both courses. For example, with a portfolio assignment in the traditional course, students are producing a bound version, while web-based students are producing electronic portfolios. If both types of portfolios meet the same learning objectives, should all students produce electronic portfolios? Although

traditional curriculum strategies can be converted into the online learning environment, online class instructors need to decide if they are still meeting the same learning objectives when using a particular constructivist strategy or if different types of digital communication applications that allow for students to blog, create social network sites or have face-to-face screen dialog would be more effective and efficient in meeting the learning objectives for both the traditional and online courses.

The advancement in technology and various online instructional tools including, digital communication applications such as, Ning (2005); PBWorks (2005); Second Life (1999); Skype (2003); TokBox (2007); Voki (2007); Wiki (2005); and Wimba (1998), have given online class instructors various methods to transmit information online and to create a learner-centered online environment. These various forms of digital communication applications allow online class instructors to incorporate various learner-centered tactics in their online courses instead of traditional face-to-face methods.

In order to understand which learning tools to incorporate into online courses that will enhance teaching and learning, research needs to be conducted to understand both the educators' and students' perceptions about the learning tools (Liaw, Huang, & Chen, 2007), and to gain a better understanding about the experience and education students are receiving in online learning environments and to determine what types of digital communication applications provide a learner-centered online learning environment.

Purpose and Significance of the Problem

As distance education becomes more visible and a vital part of colleges and universities, many online class instructors are now trying to determine how to effectively design online courses to create learner-centered online environments.

Technology is having, and will continue to have, a profound impact on colleges and universities in America and around the globe. Distance learning, which was once a poor and often unwelcome stepchild within the academic community, is becoming increasingly more visible as a part of the higher education family. (Phipps & Merisotis, 1999, p. 29)

The advancement of technology over the last decade has created various forms of new instructional methods in education for online learning (Dick, 2005). Although today's educators have various types of resources to support learner-centered online environments (West & West, 2009), advancement in technology has not increased the overall quality of the online learning environment (Zemsky & Massey, 2004).

The purpose of this study is for the researcher to obtain a better understanding of the online learning environment, to explore the various ways online class instructors have incorporated digital communication applications to try and provide learner-centered online environments, and to examine the students' perceptions of the use of digital communication applications in achieving learning outcomes.

This research study will explore the various types of digital communication applications in the online learning environment and the use of these applications in the context of various courses.

John Dewey's (1938) philosophy of education concludes that:

What we want and need is education pure and simple, and we shall make surer and faster progress when we devote ourselves to finding out just what education is and what conditions have to be satisfied in order that education may be a reality and not a name or slogan. (p. 116)

As technology continues to advance and additional digital communication applications emerge, as educators we need to “devote ourselves to finding out what education is” in the online learning environment and make “surer and faster progress” in order to begin to and create effective online learning environments and reach the demands of the growth for online courses.

Research Question

The main research question for the study is:

- What is the function of digital communication applications in the online learning environment?

Sub Questions

- How do online class instructors decide which digital communication application(s) to incorporate into their online course(s)?
- What are students' perceptions of digital communication applications in the online course(s) they have taken?

Theoretical Framework

The theoretical framework for the study is based on constructivism, which claims that learning is an active process. There are many theories of constructivism. This study will draw from Vygotsky's (1978) theory, which is based on the notion that social interaction plays a fundamental role in the learning process. Due to the difference in atmosphere and the transmission of information, students in the online learning environment may not have social interactions with other students because they are sitting alone at a computer screen and at times might be the only one "participating" (Northup, 2001). In the online learning environment, due to the transmission of material and lack of social interaction, students may then become passive participants and feel isolated (Bryceson, 2007). Online scholars believe in order for online courses to provide significant learning experiences and allow students to socially construct knowledge, students need to be able to be active learners in the learning process (Mason, 1998; Palloff & Pratt, 2007; Salmon, 2000).

In this study the purpose of digital communication applications is to create social interaction in the online learning environment. In the online learning environment the need for social interaction is almost as important as the use of the content in the course (Nipper, 1998). Digital communication applications in the online learning environment allow for social interactions through various forms of verbal and nonverbal communication modes in order for active learning to occur through social interactions. Vygotsky (1978) notes, "learning awakens a variety of internal developmental processes that are able to operate only when the child is interacting with people in his environment and in cooperation with his peers" (p. 90). This study will explore the use of digital communication applications that

allow students to be active participants in the learning process through interactions in the online learning environment.

Limitations

There are tens of thousands of online courses taught each semester at universities throughout the world. Although there are many courses taught online, many of the online class instructors do not incorporate digital communication applications into their courses. This study focused on four online courses as a convenience sample. Due to the small number of courses in the study and the small number of students enrolled in these courses, the data will only be able to give a snapshot of the overall online course phenomenon and the use of digital communication applications in the courses studied. Since the research was conducted in an environment where the researcher and participants had prior knowledge of digital communication applications and the intent of the study, there may have been predetermined assumptions for the use of digital communication applications in the learning process.

Another possible limitation is that due to the continuous advancement of technology in digital communication applications, some of the applications used during this study may no longer be relevant in the next few years. Also, some of the students taking the online courses may live in other states or in other countries; therefore, having a face-to-face interview might not be practical. Due to the various locations where the participants may live, the students' interviews were conducted using the types of communication applications available in the online courses.

Definition of Terms

The following definitions will be used in this study.

Asynchronous Interaction is staggered written and verbal communication that occurs via the Internet.

Blog is an informal written communication posted via a website in order for one to express their thoughts or ideas about a subject.

Communication Management Systems are virtual learning environments that are designed by universities as an online course's home website.

Constructivism is a theory that claims that students construct knowledge through social interaction.

Digital Communication Applications are various types of technology platforms that allow people to socially interact with one another via the Internet through asynchronous or synchronous interactions.

Digital Screen Shots are digital photos of a computer screen.

Distance Education refers to various types of classes outside of the traditional classroom environment including hybrid, polycom, corresponding and online methods of teaching.

Hybrids are courses that have both online and face-to-face components.

Interactions are written and verbal communications in the learning process.

Instructor-Made Videos are videos the instructor produces using a computer webcam or camera to discuss the course content.

Learner-Centered Environments are learning environments that encourage students to be active participants in the learning process instead of passive recipients of content.

Ning is a website that allows educators to create their own social networking sites, with an interface similar to Facebook and MySpace.

Online Content Videos are pre-produced videos, such as YouTube videos, that relate to the content.

Online Methods of Teaching are teaching methods delivered via the Internet in online learning environments.

PBworks is a free website designed to host educational workspaces in order to foster collaborative learning.

Polycom is video technology that allows courses to be taught in real time at multiple locations.

SitePal is a website that allows the user to create personalized digital speaking avatars. The avatars may be used in other forms of digital communication including Blogs, personal websites and some university computer management systems.

Skype is a free website that allows users to place voice and video calls over the Internet via webcam with other Skype users.

Synchronous Interaction is real time written or verbal communication that occurs via the Internet.

TokBox is a free website that allows users to place voice and video calls over the Internet via webcam with up to 20 other TokBox users. This application was purchased in 2011 and is now licensed under the name Opentok.

VoiceThread is an asynchronous application that can be embedded into a course CMS site and allows students to post presentations and for other students to post verbal and written comments about the presentation.

Voki is a free website that allows the user to create personalized digital speaking avatars. The avatars may be used in other forms of digital communication including Blogs, personal websites and some university computer management systems.

Widget allows for streaming information from another source such as AP News to be embedded into a course CMS site.

Wiki is a free website that allows the creation, collaboration and editing of any number of interlinked web pages via a web browser.

Wimba is a real-time virtual classroom that can be embedded into a course CMS site.

Summary

The advancement of technology continues to change the landscape of the online learning environment. In order to create effective online learning experiences, online class instructors need to look at effective ways to create social interaction and not simply convert curriculum from a traditional course to an online course. The use of digital communication

applications allows various ways for online class instructors to create both asynchronous and synchronous interactions in order for social interaction to occur through verbal and non-verbal communication. By providing social interaction students then have the opportunity to be active participants in the online learning environment.

As technology advances there will continue to be a need for research on how to effectively design online courses. This study will explore the various ways online class instructors have incorporated digital communication applications and examine the students' perceptions of the use of digital communication applications in order to gain a better understanding of the online learning environment.

CHAPTER II

LITERATURE REVIEW

Online learning is a new frontier in universities. The purpose of this chapter is to review literature about the differences between traditional and online learning environments, various perceptions of online education, the factors in designing online courses, inequality issues in the online learning environment and the future of online education. Although there is literature written on the subject of online learning environments, there is limited research on the use of digital communication applications in the online learning environment. As the use of emerging technology such as digital communication applications continues to be incorporated into online courses the use of the technology needs to be explored (Valetsianos, 2010).

Differences Between Traditional and Online Learning Environments

The design of a traditional course is different from that of an online course (Moore, 1991). Although they are different, some research has shown no significant improvements of traditional learning over online learning methods (Lammintakanen &

Rissanen, 2005). In order to effectively incorporate technology into the learning environment, educators need to consider the differences between the traditional and online learning environments (Akdemir & Koszalka, 2008; Palloff & Pratt, 2007). Ko and Rossen (2008) note the two main differences between these learning environments are the atmosphere and the transmission of the information. In order to create an effective online learning environment one must look at the differences between the atmosphere and the transmission of knowledge.

Atmosphere.

The physical differences of where a course is taught or the atmosphere plays an important role in designing a course (Moore, 1991; Huang, 2002). In designing either a traditional or an online learning environment, educators need to look at the interrelationship between the atmosphere and the transmission of information and the importance these aspects play in the learning environment. Max van Manen discusses this interrelationship between the atmosphere and knowledge and states that students get a sense of the class from their surroundings and that “the pervasive mood of a place, its atmosphere, is a complex phenomenon...Atmosphere belongs to all aspects of human existence to things, to space, to events, to time” (van Manen, 1986, p. 32).

In traditional classrooms, educators, to some extent, have direct control of the atmosphere. Traditional courses are typically taught in a set classroom and meet at a set time each day or week. Traditional classrooms may vary in size and set-up, but typically have many of the same components, including walls and desks. In traditional courses, educators are able to assess students’ comprehension of the material in real time, while it

may take days with online discussion (Howland & Moore, 2002). Real time communication allows educators to better foster a learner-centered environment, whereas, in an online environment they must wait for their students to post responses before they reply or continue to the next section (Palloff & Pratt, 2007).

In non-real time online courses, the physical atmosphere and time may differ for each student. Online class instructors need to be aware that students at first might feel disoriented in an online course due to the differences between the traditional and online atmospheres (Ko & Rossen, 2008). In the online learning environment, students can login to a course twenty-four hours a day in different locations; for instance, one day a student could be at home, another day at work and another day on vacation at the beach. In traditional classrooms, educators are present to continuously engage students whereas, in an online environment, it is unapparent to the educator if the students are engaged (Lin, Lin, & Laffey, 2008). To keep students engaged in online classes, online class instructors need to use other modes of communication besides the traditional methods (Minotti & Giguere, 2003), in order for students to be able to be interactive with one another.

Transmission of Information.

Due to the differences in atmospheres, information is not transmitted the same way in traditional and online learning environments. In the traditional learning environment, information is transmitted directly through physical interaction and verbal and nonverbal communication. On the other hand, information in an online environment is transmitted digitally via a computer, and without the use of digital communication

applications there may be no social interaction. Because of the difference in the atmosphere and the transmission of knowledge the roles of the student and online class instructor are becoming intermingled in the online learning environment. As noted by Wellburn and Eib (2010):

the roles of learner and educator are increasingly becoming intermingled in the Web 2.0 environment. Teachers may have always felt the pressure of keeping up-to-date in their field, but it is a profound change that both the learner and the “teacher” have identical access to the same vast set of recourses. (p. 45)

Thus, in the online learning environment the online class instructor role becomes more of a facilitator in the learning process. Though online class instructors and students roles are more intermingled, a concern of the online learning environment is that due to the difference in the transmission of material students may be passive learners and feel isolated (Bryceson, 2007). Students in an online course sit at a computer screen and at times might be the only one “participating” (Northup, 2001) and don’t have the social interaction one might experience in the traditional setting. Due to the transmission of information, students then may become isolated and become passive recipients of the information.

Learner-Centered Environment.

A challenge due to the difference in the atmosphere and the transmission of information between online and traditional courses is creating a learner-centered online learning environment. A learner-centered environment encourages students to be active participants rather than passive recipients of the content in the learning process (Cuban,

2009; Huba & Freed, 2000; McCombs & Whisler, 1997). Research has shown that a learner-centered environment increases students' success in the learning process (Kember, 1997; Sarasin, 1999). When students are passive recipients instead of active participants, "education becomes an act of depositing, in which the students are the depositories and the teacher is the depositor" (Freire, 1993, p. 72). John Dewey (1944) describes the difference between passive recipients and active participants as:

The former (passive) is indifferent to what is going on; one result is just as good as another; since each is just something to look at. The latter (active) is bound up with what is going on; its outcome makes a difference to him.

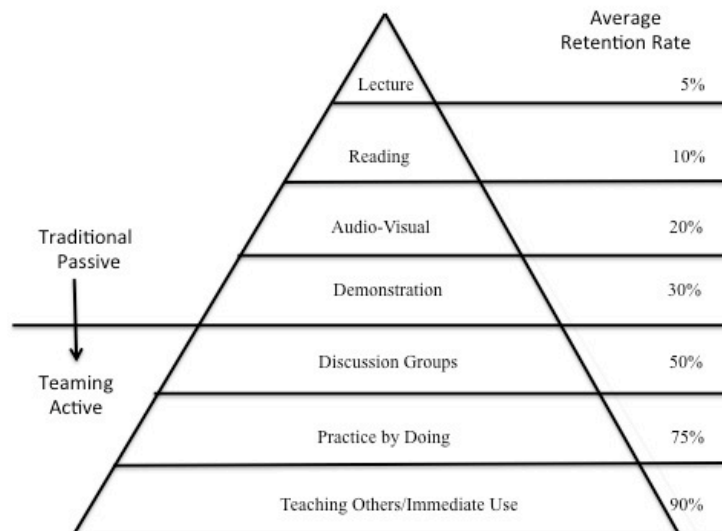
(Dewey, 1944, p. 124)

In a learner-centered environment the learning process focuses on each individual student. In the learning process, "students learn what they care about and remember what they understand" (Erickson, 1984, p. 51). Therefore, in order for students to understand and retain the information, educators need to create process-driven instead of content-driven learning environments (McGlynn, 2007; Dale, 1969). The use of process-driven activities allows the student the opportunity to be an active participant through social interaction.

The Learning Pyramid (See Figure 1) compares content-driven and process-driven teaching methods of students' retention rates and demonstrates that students' retention rates are higher in process-driven teaching methods where they are active participants (Dale, 1969).

Figure 1

The Learning Pyramid



(Dale, 1969, p. 43)

Although students' retention rates are higher in process driven learning environments, in today's traditional learning environments, lectures are still the standard form of teaching (Knewstubb & Bond, 2009; Ko & Rossen, 2008). Therefore, students are retaining less than ten percent of the information they receive (Dale, 1969; Steele, 2009).

Since teachers often teach the way they were taught (Fosnot, 1989; Jones, Palinsar, Ogle, & Carr, 1987; Lortie, 1975), Vega & Tayler (2005) suggest that the switch to learner-centered methods might be challenging because "faculty members inexperience with pedagogical techniques or resources, limits the effectiveness of their

attempt to move from the transmission model of teaching to more interactive facilitation models” (p. 83). The switch may also be hard for students since they have been “conditioned to be passive for so many years that by the time they’re in secondary school or college, active learning can feel strange” (Jenson, 2005, p. 54). Although switching from teacher-centered to learner-centered environments may be difficult for educators and students, by creating a learner-centered environment that is process-driven, students are active participants and retention rate is higher (Dale, 1969).

Although there are many proponents of the learner-centered environment (Huba & Freed, 2000; McCombs & Whisler, 1997; Weimer, 2002), technological advances have prompted criticism of the learner-centered teaching model. Although Dillenbourg (2008) discusses the benefits of various teaching models when using technology in both the traditional and online environments and advocates for the need of “teacher-centric constructivist methods”; his major concern is the role of the educator when technology is incorporated into the design of the course.

Despite all claims that technology will never replace teachers, the developments of replacement technologies reveal contrary underlying assumptions. The often-used slogan ‘from the sage on the stage, to the guide on the side’ conveys the message that technologies induce an evolution of the teachers’ role from knowledge provider to learning facilitator. Even if one accepts that the evolution is a desirable goal, one must reflect carefully on the idea of putting the teacher on the side. (Dillenbourg, 2008, p.131)

Although the fear that technology might put the “teacher on the side” in a learner-centered environment the power does not shift to one side but is shared between the educator and students (Weimer, 2002). In either a traditional or online learner-centered environment the educator is the facilitator of the knowledge and will “know when to hang back and be silent, when to watch and wonder at what is taking place around them” (Ayers, 1986, p. 50).

There are challenges and differences between online and traditional communication and the transmission of information, but online courses can still be effective and influence new ways to communicate (Ko & Rossen, 2008). In online courses because the technology is the primary mode of communication, the challenge then becomes how online class instructors can create social interactions and facilitate learning as one does in the traditional learning environment.

Various Perceptions of Online Education

Because of the different ways information is transmitted and the atmosphere between traditional and online learning environments, online class instructors need to remember when designing an online course that both the student and the instructor play different roles and face different challenges compared to the traditional setting (Conrad & Donaldson, 2004; Buono, 2004). Since the roles of the educators and students are different in the online learning environment than in the traditional classroom (Conrad & Donaldson, 2004), the perception of the environment is also different. Students’ perceptions about their learning experiences in online classes has an impact on their overall satisfaction of the online learning environment (Kenny, 2003). Various research

studies on students' and educators' perceptions of online classes have been conducted (Bolliger & Martindale, 2004; Bolliger & Wasilik, 2009; Howland & Moore, 2002; Hughes & Daykin, 2002; Kenny, 2003; Liaw, 2008; Lin et al., 2008; Motteram & Forrester, 2005). Bolliger and Martindale (2004) determined that the three factors that influence the satisfaction of students in online learning were interactivity, the instructor and technology.

Interactivity.

In the online learning environment the need for interaction is important for students to be successful learners (Conrad & Donaldson, 2004; Draves, 2000; Kearsley, 2000; Palloff & Pratt, 1999, 2001, 2005, 2007; Sims et al., 2002; West & West, 2009). Many research studies that have focused on the success factors of the online learning environment have contributed communication and social interaction as one of the key success components (Carr-Chellman & Duchastel, 2000; Martz & Reddy, 2005; Muilenburg & Berge, 2005; Novitzki, 2005; Ostlund, 2008; Romero, du Boulay, Cox, Lutz, & Bryant, 2007). Muilenburg and Berge (2005) study looked at students' perceptions of the various barriers within the online learning environment and concluded that:

A lack of social interaction was the most severe barrier as perceived by students overall...and, there is a marked drop-off of perceived barriers for students who have taken only one course compared to those who have taken no online course. (Muilenburg & Berge, 2005, p. 45)

Although students perceive social interaction as an important factor in their satisfaction of an online course, social interaction is hard to cultivate in an online environment. Therefore, in order to gain significant learning experiences in the online learning environment, online class instructors need to incorporate various ways for students to be able to socially interact with one another (Bryceson, 2007).

Instructor.

An online class instructor plays an important role in the satisfaction of the students (Bolliger & Martindale, 2004). A study by Kupczynski et al., (2010) looked at the students' perceptions of the online class instructors' presence and the success in the course. The researchers determined that students perceive that the online class instructor plays an active role in the success of the instructional design, organization and direct instruction, including quality feedback, which is needed for overall achievement in the course (Kupczynski et al., 2010).

Since online class instructors play a role in the success of the design, organization, and instruction, they must be proficient in the technology being used in order to establish credibility with students (Collins & Berge, 1996). Powell and Kalina (2009) stated that, "the more prepared and comfortable teachers are in using effective tools such as conversation, discussion, and inquiry; the more they will use them and students can be adept at thinking and communicating" (p. 247). Powell and Kalina (2009) concluded, "instructors who do well online promote a sense of autonomy, initiative and creativity while encouraging questioning, critical thinking, dialog and collaboration" (p. 207).

In looking at the important roles online class instructors play, one must also look at their perception of the online learning environment. A study by Bolliger and Wasilik (2009) examined the factors that influence the satisfaction of online class instructors in online teaching. The most important factors were student-related issues, followed by instructor-related issues and institution-related issues (Bolliger & Wasilik, 2009). The notion of student-related issues being the most important factor for online class instructors demonstrates the need for online class instructor to student interaction in the online learning environment.

Technology.

The other important factor of students' success was the technology. New technologies continue to emerge allowing for new opportunities for social interaction in the online environment (Beldarrain, 2006; Lin et al., 2008). Although digital communication applications can create social interaction, sufficient social interaction is not guaranteed just because the technology is designed to create it (Kreijns, Kirschner, & Jochems, 2003). When using various technologies, such as digital communication applications, to create social interaction in the online learning environment, online class instructors need to understand the effects these emerging technologies have on the social presence in a course and select the appropriate technology for the course (Beldarrain, 2006). For meaningful social interaction to occur it needs to be organized (Kearsley, 1995) and designed to the curriculum of the course (Liaw & Huang, 2000; Northup, 2001). To create social interaction in the online learning environment, "research is needed to investigate how students and teachers can use these tools for educational

purposes, and what benefits or problems arise” (Kear, Woodthrope, Robertson, & Hutchison, 2010, p. 218).

There have been various research studies that have looked at the use of digital communication applications including Wikis (Kear et al., 2010; Arnold, Ducate, Lomicka, & Lord, 2009); Skype (Yang & Chang, 2008); Wimba (Marriott & Hiscock, 2002); Second Life (Smith & Berge, 2009) and Instructor-Made Videos (Rose, 2009).

In a study about the perceptions on the use of Wikis as a tool for collaboration (Kear et al., 2010), the researchers looked at students and tutors perspectives of the use of Wikis compared to discussion forums. Although some students gave positive feedback about the use of Wikis other students preferred the discussion forums because of usability. Some students stated they had problems with the use of various functions and that Wikis do not have all the functions they needed, such as video, for the course. Students also noted having social discomfort using Wikis because it was not as personal or secure. Students did not like editing other students’ work and wanted to be able to make their information private from other students. For the tutors, they liked Wikis because they could monitor the collaboration and see what each student had contributed to the assignments. However, the tutors also had concerns about the usability and lack of functions needed for students to complete the assignments. So, although Wikis are designed to allow for collaboration in the online learning environment, the researchers concluded that digital communication applications need to be useable and sociable in online learning (Kear et al., 2010),

Skype has been used in the online learning environment in order to allow students to socially interact among other students and online class instructors. Although Skype is typically used for face-to-face talking, the application has various features that allow for participants to talk without video or to type without audio. In a study that looked at the use of Skype to help with oral proficiency in speaking English the researchers, Yang and Chang (2008) noted some of the advantages of voice based applications over text based applications: “immediate phonetic feedback, real-voice conversation more authentic interaction” (p. 722). But when looking at the use of Skype in the online learning environment, the study concluded that students who had structural discussions in order to become more proficient in English did not have higher levels of proficiency by the end of the study than those who had unstructured discussion. This demonstrates that although there are advantages to various types of digital communication applications, the applications may be used in different ways, such as structured or unstructured discussions, in order to create interaction and achieve the same results.

The use of Wimba (synchronous communication) and VoiceThread (asynchronous communication) allows students the opportunity to use either audio or text in order to communicate with one another. In an exploratory study, Marriott and Hiscock (2002) looked at the ways in which students communicated with one another when using Wimba. The researcher found that when using the discussion forum in Wimba, most students preferred to make text posts to audio posts. So although students have the options to use either audio or text, students prefer to use the text option, which is more of a traditional form of communication in the online learning environment.

Second Life has been used in the online learning environment in order to allow students and online class instructors to socially interact with one another. In looking at virtual learning many asked questions about how one can effectively teach problem solving in unrealistic consequences but others believed there are limited possibilities with the use of virtual environments in online education (Smith & Berge, 2009). Researchers Smith and Berge (2009) explore students' interactions in Second Life through the lens of Bandura's (1977) social theory; that knowledge is constructed through social interaction with others. The researchers note from a technical standpoint, Second Life, "is an open source environment that fosters observation, imitation and modeling behavior where residents are constantly learning from one another" (Smith & Berge, 2009, para. 28). But Second Life in relation to Bandura's social theory is absent because of the inability to observe other's attitudes and their emotional reactions (Smith & Berge, 2009), which is a critical component of the learning process. Although there may be "limitless possibilities" with virtual worlds one must look at the social interactions in relation to the learning process to determine if the use of the digital communication application is effective in meeting the course objectives.

Another type of digital communication application used in the online learning environment is instructor-made videos. Rose (2009) looked at the students' perceptions of instructor-made videos in both online and face-to-face courses. The researcher affirmed that through the use of instructor-made videos, students felt more connected to the online class instructor and felt that videos helped them understand the material. Also, of the students who answered the survey, 100% of online students in the online course reported watching the videos that offered topical information. The use of instructor-made

videos may then be used to create a social presence of the online class instructor for the students allowing the students to feel connected to others in the online learning community.

Although the use of digital communication applications continues to emerge in the online learning environment, the use of these applications might not be as successful as other methods in reaching the overall learning objectives of the course. When incorporating various types of technology into an online course, online class instructors need to focus on overall course design (Conrad & Donaldson, 2004).

Online Course Design

When designing online courses, some online class instructors fail to realize that the online learning environment is not about the technology but about creating a different structure for learning (Kearsley, 1998; Palloff & Pratt, 2007). When designing online courses, online class instructors need to consider: technology (Kearsley, 1998; Palloff & Pratt, 2007); student readiness (Palloff & Pratt, 2001; Samarawickreme, 2005); access (Palloff & Pratt, 2001, 2007); time (Conrad & Donaldson, 2004; Ko & Rossen, 2008; Maor, 2003; Palloff & Pratt, 2007); building a community (Lin, Gomez, & Yen 2009; Sadera, Robertson, Song, & Midon 2009); asynchronous interactions and synchronous interactions (Conrad & Donaldson, 2004; Ko & Rossen, 2008; Palloff & Pratt, 2007); assessment (McVay, 2002; Palloff & Pratt, 2009) and security (Palloff & Pratt, 2007).

Technology

The advancement of technology has had an effect on the instructional designs of online courses. But how to use technology in distance education is still “fuzzy”

(Valetsianos, 2010). To determine the right type of technology needed for an online course, online class instructors need to first look at the learning objectives for the course then select the most effective type of technology to meet those objectives (Conrad & Donaldson, 2004; Hirschbuhl, 2007; Kearsley, 1998; Palloff & Pratt, 2001, 2005, 2007; Sims et al., 2002; West & West, 2009).

To design online courses many universities use Computer Management Systems (CMS), which are virtual learning environments that are designed by universities as an online course's home website, in order to provide a standard look and tools that allow the transmission of information among users. CMS are packaged program systems that provide course templates for faculty, making it easier to design online courses (Koszalka & Ganesan, 2004). Although the CMS have proven to increase interaction among faculty and students, many online class instructors use these systems for administration and the transmission of course information rather than as a pedagogical tool (Morgan, 2003). Online class instructors may use CMS tools to post assignments, course content, grades and for discussion boards, to discuss questions about the assignments, but don't use them to allow students to be socially interactive with one another in the learning process.

The transmission of information and the atmosphere plays a role in the effectiveness of CMS tools in the online learning environment. One of the standard CMS tools is the discussion board. Discussion boards are designed to create interaction among the students and educators. Dennen and Wieland (2007), in their study, determined that a large number of students find it more useful to share ideas on a discussion board in the online learning environment than to talk in a traditional classroom. But, although students are engaged in posting their ideas, they don't engage as meaningfully with their

classmates when reading and replying to another student's posting (Dennen & Wieland, 2007). By not being engaged during the entire discussion process, the social construction of knowledge aspect is eliminated from the learning process. For social construction to occur online class instructors need to find ways to create interaction in the online learning environment.

Although there have been many failed attempts of technological innovation to enhance learning (Clark & Mayer, 2003; Means & Olson, 1994), the use of advanced technology in online learning is positive (Nicilaou, Nicolaidou, & Constantinou, 2005).

The reason for the optimism in technology used in online learning is because:

1. Networking technologies provide sophisticated communication capabilities that are better tuned to the requirements of teaching and learning.
2. The learning sciences have a better grasp of requirements and potentialities offered by technological solutions.
3. Empirical research tools can support the process of implementation through more authentic evaluation of actual learning outcomes.
4. There is enhanced teacher awareness of the need for dramatic improvements in order to achieve better quality in education.

(Nicilaou et al., 2005, p. 606)

Through the advancement of technology, there are various opportunities including the use of digital communication applications for students to be active participants in the online learning environment (West & West, 2009).

Student Readiness

For students to succeed in the online learning environment, they must be comfortable with the technology (Palloff & Pratt, 2005) and, in order to have an effective design, the course must be easy to navigate (Palloff & Pratt, 2001, 2007). Palloff & Pratt (2001) state that although in the online learning environment “it is assumed that if students can navigate the courseware being used, they should successfully complete the class. In our experience, students also need training to learn what is expected of them in the online classroom” (p. 15).

Some universities, including the university where the research is being conducted, have created computer modules that can predict the students’ readiness and effectiveness in the online learning environment. These modules ask a series of questions that allow the student to self-assess his/her readiness to take online courses. The questions may cover topics about students’ accessibility to Internet access, their proficiency in using various software programs, how they best construct knowledge and prior online learning experiences. After completing the modules, students are ranked by the computer-based test in various categories. Students are then able to view their rankings it determine their overall readiness for the online learning environment.

Since students new to the online learning environment can become overwhelmed by the experience at first (Conrad & Donaldson, 2004), it is recommended that online class instructors immediately build a rapport with their students on the first day of class (Conrad & Donaldson, 2004; Ko & Rossen, 2008). This could be done by having the students write a blog about themselves, or by having the students answer questions about

themselves or by using a digital communication application such as a welcome instructor-made video. In online education, “the degree to which a person is perceived as real in an online conversation” raises the student’s learning to a higher level (Meyer, 2002, p. 59). By building rapport it would allow students to begin to feel as if they were a part of the learning community and to begin to become familiar with the online learning environment.

Access and Technical Issues

Technical difficulties in online courses will continue until compatible technology is available for all students (Howland & Moore, 2002). When designing online courses, online class instructors need to consider the type of Internet service that is accessible to students during the course. Students without access to high speed Internet may find it more difficult to communicate or receive material (Palloff & Pratt, 2001, 2007). Palloff & Pratt (2007) note that, “the most beautiful construction site, complete with graphics, audio and video, is useless to a participant working with older technology to access the site or limited experience with newer technologies” (p. 91). Universities need to support online students by providing technical support for online courses (Howell & Wilcken, 2005). To assist students with these technological challenges, online class instructors should design a section on the course’s home page with technical support information and links to various software upgrades that are offered through the university or online (Ko & Rossen, 2008). As noted by Kelly (2001), “If they’re having trouble with the technology, it’s like showing up at a class and the door is locked and they can’t get in” (p. 5). By addressing potential technical difficulties in advance students can focus on learning.

Time

When designing an online course, online class instructors need to take into account the additional time needed to facilitate an online course and also the time issues of their students. As noted by Boettcher and Conrad (2010), “For faculty accustomed to teaching face-to-face classes and meeting students one, two, or three days a week, the demands of teaching an online course can be shocking. Students often expect faculty to be there all the time” (p. 77). Online class instructors can spend over twice the amount of time each week facilitating an online class from the time spent on a traditional course. The average educator, who spends approximately six to seven hours each week preparing a traditional course, will take up to 18 to 19 hours each week to facilitate an online course (Palloff & Pratt, 2007). Students spend an hour more a week participating in an online course than they do in a traditional course (Halsne & Gatta, 2002). Boettcher and Conrad (2010) recommend online class instructors should, “Develop a set of explicit expectations for your learners and yourself as to how you will communicate and how much time students should be working on the course each week” (p. 40). Also, by setting expectations it gives both the online class instructor and the online student realistic guidelines of the time needed to meet the requirements of the course.

Building a Community

A key factor in building online communities is social presence (Cobb, 2009). Social presence in the online learning environment can play a part in the overall role of the success of a student (Lin et al., 2009; Sadera et al., 2009). In order for students to be successful, online class instructors should create a supportive online course community:

For students who need it, it is an essential part of how they learn. Vygotsky's theories remind us of how much we learn as social beings within a social context. The online community is part of what makes this happen for many students. (Boettcher & Conrad, 2010, p. 40)

Sadera et al. (2009) looked at the success of students in relation to the online community and found a high positive correlation between students who were active participants and the learning index of meeting course objectives and self-reported learning. These findings emphasize the need for students to be able to be active participants in the online learning environment.

In order to create and maintain an online community informal conversations are needed among participants (Hoadley & Pea, 2002). Although students are required to create interaction through various forms of discussion and assignments, it may be hard to cultivate informal conversations. In a study conducted by Jones, Johnson, Millermaier and Perez (2008), which surveyed students at over 29 universities, the researchers noted that over half of the participants (55%) rarely (once or twice per semester) contacted another student when it was not part of the course requirements. Due to the limited amount of informal social interactions initiated by students, online class instructors need to incorporate formal interactions into the design of their courses to try and foster an online learning community.

One way to create social presence is through the use of digital communication applications, but Brady, Holcomb, and Smith (2010) note that, "communities can't be forced even in media that lend themselves to high levels of engagement" (p. 157). In

order to build communities, online class instructors need to verify that the use of digital communication applications in the online learning environments are not focused on students but are used in order to assist students in reaching the course's learning objectives.

Asynchronous Interactions vs. Synchronous Interactions

How one creates social interaction in the online learning environment is different through the use of digital communication applications that create either asynchronous interactions or synchronous interactions. Asynchronous interactions, such as discussion boards and Wikis where postings are staggered, allow for students to interact at various times. Asynchronous interactions can be beneficial since they allow students to express ideas that they may not say in a traditional classroom. Citing various sources Bradley, Thom, Hayes, and Hay (2008), note there are advantages of online discussion including “convenience and flexibility of access, increased reflection time for posts, less intimidating content for introverted students and increased number of discussion comments” (p. 889). Alternatively, asynchronous interactions can be a challenge because students may feel isolated from their classmates since they may “communicate” at different times (Palloff & Pratt, 2007). The thread design of discussion boards causes students in the online environment to need more time to respond to others' comments than the traditional classroom where students are in the same classroom (Ko & Rossen, 2008). Some online class instructors recommend allowing students up to two weeks to “discuss” the course material (Conrad & Donaldson, 2004). In designing the course with asynchronous interactions, the online class instructor will then need to consider the additional time needed to “discuss” the course material.

Although discussion boards can be used in online learning in order for students to be active participants in the learning environment (Larkin-Hein, 2001), there is some concern with the level of students' engagement in critical thinking (Bai, 2009; Gilbert & Dabbagh, 2005) and participation (Boettcher & Conrad, 2010). As noted by Boettcher and Conrad (2010), "You can assure that students don't participate in discussion by not allocating any assessment points to the discussion" (p. 94). A study conducted by Gilbert and Dabbagh (2005), stated that less than a quarter of students' responses to discussion boards demonstrated high levels of critical thinking as defined by Bloom's Taxonomy.

Discussion boards are designed to create interaction, but some believe it lacks the personal touch which can be used in digital communication application social media sites such as Ning (Brady et al., 2010). In observing discussion forums Hallett and Cummings (1997) noted that although online class instructors used various prompts in discussion forums to create interaction, the natural interaction among students did not occur (p. 105). In order to raise the level of students' engagement in critical thinking students need to be given guidelines of what is effective in online discussions (Bai, 2009; Black, 2005).

Synchronous interactions using digital communication applications, such as Wimba and Skype, allow for real time communication. These interactions can be beneficial because they can allow for verbal communication, but it can be a challenge to coordinate available times, such as the different time zones in which the students live in order for everyone to participate in the discussion (Pratt & Palloff, 2007). In order for real time communication activities to be effective it is recommended that students be given expectations in advance to prepare for the activity so that time is not wasted during the activity (Pratt & Palloff, 2007).

Although there is a difference between the use of asynchronous interactions and synchronous interactions, the use of these types of interactions can allow students to be active participants in the online learning environment.

Assessment

Assessment is another key issue in designing an online course. Beebe, Vonderwell, and Boboc (2010) looked at how online class instructors transferred their assessment practices for traditional to online learning environments. The study noted various factors that have an impact on effective online assessment including technological, managerial and pedagogical practices. The researchers recommended in regards to assessment that a pedagogical online framework must look at the difference between traditional and online learning environments; and the framework should address the process and the product aspects of online assessment. (Beebe et al., 2010).

In the online learning environment “assessment should play a crucial role in helping students to develop as effective online collaborators” (Macdonald, 2003, p. 388). Online scholars note the types of assessments used for an online course should align with the course design and objectives for the course (Conrad & Donaldson, 2004; Cross, 1996; Palloff & Pratt, 2003, 2005, 2007, 2009; West & West, 2009). Assessment in “the online environment has also brought additional concerns and a call to move beyond traditional means of identifying what students know during and at the end of the course” (Palloff & Pratt, 2009, p. 4). Many online class instructors believe that assessment should be composed of multiple and authentic approaches to allow students multiple ways to construct knowledge (Conrad & Donaldson, 2004; Jonassen, Peck, & Wilson, 1998; Ko & Rossen, 2008; McVay, 2002; Palloff & Pratt, 2001, 2009), and that a significant

weight should be placed on the quality of the student's participation in online communication (Palloff & Pratt, 2007, 2009). By addressing the process and product aspects of online assessment, online students can begin to become "effective online collaborators."

Academic Integrity

Academic integrity is a challenge in both the traditional and the online learning environment. Though some concur that the design of the online learning environment aids to academic dishonesty because one is unable to determine who is actually doing the course work or taking the test or quizzes (Wang, 2008), others have found that academic dishonesty is the same in the traditional and online learning environments (Grijalva, Nowell, & Kerkvliet, 2006; Spaulding, 2009). Spaulding's (2009) study, looked at students' "Perceptions of Academic Honesty in Online vs. Face-to-Face Classroom", and noted that overall 40.7% of students have observed other students using information from the Internet and turning it in as their own work. The study concluded that although some research has shown there may be a difference in academic integrity in online courses vs. traditional learning, and that academic dishonesty is prevalent in education "that there may be unnecessary alarm concerning the prevalence of academic dishonesty in online courses as opposed to face-to-face courses" (Spaulding, 2009, p. 196).

The account of academic dishonesty is still prevalent in education. To safeguard the academic integrity of an online course, online class instructors can incorporate various tools such as Turnitin.com, a tool used to confirm plagiarism; browser locks tools, which allow students access only to online course web browser in the assessment

process and locks access to browse any other computer application including websites and word documents; and keep discussion boards private. Thus, the use of these tools may alleviate some forms of unethical behavior in the course by students looking up or sharing answers or by copying information from the Internet and turning it in as their own work.

Security

Although the Informational Technology (IT) Department of most universities handles the security features of the CMS system, there are various ways a breach in the security of the system may occur. The security threats in online courses may come from many angles, including students posting files from other websites that knowingly or unknowingly have viruses and people giving out the classroom passwords to unauthorized users allowing others to “participate” in the class (Palloff & Pratt, 2007).

Additional security issues occur with the use of digital communication applications in an online course. Because each digital communication application is on a different technical platform and has different privacy settings, educators or students may believe they are securing information correctly, but instead are allowing anyone on the Internet access to the course or to students’ personal information. Due to concerns of the use of digital communication applications, school administrators have banned some types of digital communication applications such as social networking (Brady, 2007).

Although schools site security risks for some sites, the ban on certain types of digital applications from schools can have an effect on the overall pedagogical design of the

course. The advance of technology then creates an issue of pedagogical design or participant privacy when designing an online course.

In order to provide security to the class, online class instructors need to be vigilant about the privacy issues for the various applications used in their courses. When students and online class instructors use social networking sites, a company, such as Facebook, may gather and share personal information about the user, including websites and various types of files the user accesses via the Internet. On Facebook's website (2010) the privacy statement says, "When you access Facebook from a computer, mobile phone, or other device, we may collect information from that device about your browser type, location, and IP address, as well as the pages you visit" (www.facebook.com). Websites, such as www.wikispaces.com (2010) states, "We do not share personally identifiable information with third parties", but the website also states that:

This website contains links to other sites that are not owned or controlled by Tangient LLC. Please be aware that we, Tangient LLC, are not responsible for the privacy practices of such other sites. We encourage you to be aware when you leave our site and to read the privacy statements of each and every website that collects personally identifiable information. (www.wikispaces.com)

When using digital communication applications online class instructors need to stay aware of privacy issues in order to confirm the security of all the participants' information.

Security threats will continue as online education advances and more digital communication applications emerge. In order to keep the course information secure, both

students and the online class instructor need to be aware of the privacy settings for all Internet sites so that they may be able to control the privacy issues for all participants and anticipate other threats that may occur.

Inequality Issues

There are concerns about inequality in the online learning environment in relation to all students having prior knowledge about technology, the course content and having access to the technology.

Prior Experience with Technology vs. Content

The Net Generation students were born between January 1977 and December 1997, making up 27% of the population (Tapscott, 2008). In his book *Grown up Digital*, Don Tapscott (2008) established the need for education to change in order to engage the Net Generation students who have grown up in the digital world. In the last ten years, the amount of time each student spends on the computer has increased rapidly and continues to increase with each generation of students. These students have high expectations regarding the use of technology in education and are often more familiar with technology than many educators (Waterhouse, 2005). They want to have control in when and how they learn (Beldarrain, 2006; Tapscott, 2008). This generation was raised in the digital era and research has shown that the Internet as an interactive form of communication has continued to supersede their use of television, a one-way form of communication (Tapscott, 2009; Vollmer & Precourt, 2008). According to the Kaiser Family Foundation Study by Rideout, Foehr and Roberts (2004) the Net Generation aged 8-18 spent 27 minutes of recreational time each day online. Ten years later, people aged 8-18 spend 99

minutes of recreational time each day online. Since the Net Generation usually prefers interactive forms of communication online class instructors need to determine if there are effective ways to engage all students in meeting the course objectives by staying at the forefront of technology.

Although the Net Generation has been raised in the digital era, some students still don't have prior experience with technology and "without any prerequisites, students come to college with differing technological skills, stratified by gender, socioeconomic status, and racial background" (Goode, 2010, p. 583). Without prior experience of technology it can create hardship in relation to their proficiency in an online course, as noted by Jung, Qui, and Kim (2001) "there is a dynamic relationship between time and established proficiency in computer media. A novice student may need more time to accomplish what an experienced user can do quickly" (p. 510). So students who have prior experience with technology will have advantage over students who do not have the same type of experience.

Though there is literature on the inequality issues based on students' prior experience with technology, some don't believe students' prior experience with technology has a significant impact on their learning in the online learning environment but that their prior knowledge of the content is what makes the difference. As noted by Wellburn and Eib, (2010), although students are familiar with technology it does not necessarily mean that students know how to learn in the digital environment. Therefore, even if a student has "grown up digital" the advantages might not be as beneficial as their previous knowledge of the content. In the online learning community, "learners with little prior knowledge will benefit differently from instructional methods than will

learners who are relatively experienced” (Clark & Mayer, 2007, p. 26). One then can assume that prior knowledge plays a key factor and if students do not have prior knowledge depending on the design and the teaching methods used in the online course inequality issues may occur.

Access to Technology

The digital divide may be more relevant in online courses in terms of who has access to the technology. Although mainstream technology is more accessible and cheaper for most students, the cost continues to divide students into two groups: the haves and the have-nots. In Friedman’s book *The World is Flat*, he notes that the “the world is only half way flat”, for some, due to the limited resources in technology (Friedman, 2005). Those that have the funds for technology have an advantage in their classwork; while those without resources for technology are left behind. And these students who do not use new types of technology are at a potential disadvantage to their peers who use these types of technology, with students in the lower spectrum of technology knowledge often not enrolling in courses that use heavy technology (Goode, 2010). As technology advances, the lack of access for some students will continue to create a greater division between the two groups, of “the flat and the half flat”, rather than creating equal opportunities in education (Kissock, 2005).

In order to address inequality issues, online class instructors need to take into consideration what impact students’ previous experience with technology; prior knowledge of the content and their access to technology has on their learning experience in the online learning environment.

Future of Online Education

The advancement of digital communication applications in online learning environments will continue to provide more opportunities in the design of online courses. Thomas Friedman (2005) notes that in the future “collaborating with all the digitized data is going to be made even easier and cheaper” (p. 165), thus making it more accessible in education. As digital communication applications continue to emerge, there will be a demand to begin to incorporate them into the online learning environment for students, as the use of advanced technology is critical for the future of education in order to stay competitive (Friedman, 2005). The notion of continuing the status quo in the online environment is no longer an option. The option now is how to effectively incorporate the advanced technology into the online learning environment.

Summary

This chapter provided a review of the literature about the differences between traditional and online learning environments, the various perceptions of online education, factors in designing online courses, inequality issues in the online learning environment and the future of online education. Although much literature has been written on the subject of the online learning environment, as technology continues to advance, additional research needs to be conducted.

CHAPTER III

METHODOLOGY

The purpose of this study was for the researcher to obtain a better understanding of the online learning environment, to explore the various ways online class instructors have incorporated digital communication applications to try and provide learner-centered online environments, and to examine the students' perceptions of the use of digital communication applications in achieving learning outcomes. The methodology used was qualitative naturalistic inquiry drawing from Lincoln and Guba's (1985) naturalistic research paradigm.

The naturalist paradigm has "mostly been applied to knowledge generation and research in the field of education" (Erlandson, Harris, Skipper, & Allen, 1993, p. 8). The axioms set forth in the naturalist paradigm are:

1. Realities are multiple, constructed and holistic.
2. Knower and known are interactive, inseparable.

3. Only time- and context-bound working hypotheses are possible.
4. All entries are in the state of mutual simultaneous shaping, so that it is impossible to distinguish cause from effect.
5. Inquiry is value-bound.

(Lincoln & Guba, 1985, p. 37)

Naturalist inquiry is based on the ontological, epistemological, and methodological axioms in the naturalist paradigm. The researcher used naturalistic inquiry by exploring the use of digital communication applications in the societal and individual context, in order to construct new realities about the function of digital communication applications in the online learning environments. The essence of research for naturalistic researchers is:

The ability to get inside the social context, to share constructed realities with the stakeholders in that context, and to construct new realities that enhance both the knowledge of the researcher and the knowledge and efficacy of the stakeholders.
(Erlandson et al., 1993, p. 68)

Naturalist inquiry is complimentary to constructivist theory based on the ontological and epistemological beliefs of the naturalist paradigm in which there are multiple realities and knowledge is considered constructed through interaction. Based on the context of digital communication applications, literature and research, the study drew from Vygotsky's constructivist theory which is based on the notion that social interaction plays a fundamental role in the learning process (Vygotsky, 1978). In this study the purpose of digital communication applications were to allow students to be active

participants in the learning process through interactions in the online learning environment. Literature on the online learning environment notes that in order to assist students in being successful learners in an online learning environment, interaction is important (Conrad & Donaldson, 2004; Draves, 2000; Kearsley, 2000; Palloff & Pratt, 1999, 2001, 2005, 2007; Sims et al., 2002; West & West, 2009), which is consistent with the elements of constructivism. Although there is lack of research about the use of digital communication applications in the online learning environment, research that has been conducted in online learning environments concluded that students perceive the lack of social interaction as one of the main barriers to learning in the online learning environment (Muilenburg & Berge, 2005). To explore the use of digital communication applications, the researcher used tacit knowledge in order to “incorporate the subtle differences of reality” (Lincoln & Guba, 1985, p. 39). Qualitative research methods were used in the study in order to gain in-depth knowledge and to improve understanding of the phenomenon (Patton, 2002).

Research Design

The design of naturalist inquiry studies encompasses emergent design flexibility within the study. This study drew from the interpretation of Erlandson et al., (1993) regarding a naturalistic inquiry approach as one of “observing, recording, analyzing, reflecting, dialoguing and rethinking” (p. 4). For the study the researcher began by interviewing online class instructors on their use of digital communication applications in their online course and observed the students’ experiences with various types of digital communication applications in the online learning environment and then interviewed students about their perceptions of the use of digital communication applications. The

use of naturalistic inquiry allowed the researcher to explore the various contexts of the nature of digital communication applications in the online learning environment.

Research Procedures

Before the research was conducted, the researcher received permission from the Institutional Review Boards from both the university where the degree was earned and the university where the research was conducted (Appendix F). The following are the procedures that guided the study.

1. The researcher completed an IRB application to seek permission to conduct research and submitted the application to the Research Site's University's Institutional Review Board (IRB) where the research was conducted. To receive approval for online consent, researcher had to qualify for a waiver of documentation of consent as defined by the IRB.
2. Once the IRB application was approved through the Research Site's University's IRB, the researcher completed an additional IRB application and submitted it to Oklahoma State University (OSU) IRB for approval. This application included a copy of the approved IRB application from the university where the research was conducted.
3. Once OSU approved the application, the researcher recruited participants and solicited signed consent forms from the online class instructors participating in the survey.

4. Once the online class instructors signed the consent forms, the researcher solicited permission to have online access to the courses for the semester.
5. Interviews were conducted with the online class instructors that were selected for the research study.
6. The researcher then emailed all students in the online courses, with each course having approximately 20 students, a written description of the research study and asked for an email reply with their consent (as defined in the IRB waiver of documentation) to participate in the study.
7. Each week, throughout the study, the researcher observed each of the online courses via the Internet through the university's course management system and the digital communication application websites.
8. After finals were completed, the researcher interviewed selected students in each course.
9. Due to the themes that began to emerge the researcher added an additional course to the study in the summer semester. In order to add an additional course the researcher made modifications to the approved IRB forms at each university and resubmitted the forms to the IRB at both of the universities.
10. Once approval was received from both universities, the researcher followed steps (3-8) for the summer semester.
11. The data then were analyzed. Only the researcher had access to the data. All data were kept in the researcher's office in a locked filing cabinet.

12. After the approval of the dissertation, all data collected for the study were destroyed.

Methods

Research Setting

Each of the online courses in the study was taught at the same regional public university in the suburban area of a metropolitan city in a Midwestern state. The setting for the study took place for the various course selected for the study via the university's course management system WebCT. For the spring semester, the university offered over one hundred courses online with several courses offering multiple sections; and for the summer semester the university offered approximately forty online courses. For this study, the researcher observed three of the online courses in the spring semester and one online course in the summer semester. This allowed the researcher to persistently observe the use of various types of digital communication applications in the online learning environments.

Selection of Participants

Selection of online class instructors.

The online class instructors for the study were purposely selected based on the recommendations from the university's Office of Online Learning. The Office of Online Learning is in charge of overseeing the design and approval process of all online courses at the university. The Office of Online Learning's designers work directly with each of the online class instructors on the overall design and ways to incorporate various forms of

digital communication applications into the course. From working with the online class instructors on the design of their courses, the Office of Online Learning provided the researcher a list of recommended online courses based on the following criteria: 1. the teaching philosophy of the online class instructor was judged to be learner-centered with the class designed to allow students to be active participants in the learning experiences instead of passive recipients, and; 2. the online class instructors used digital communication application(s) in the course to try and create a learner-centered online learning environment. In selecting the participants, the researcher emailed out a questionnaire to potential participants from the list provided by the Office of Online Learning. The questionnaire asked the potential participants about their teaching philosophy, the design of their online course and the use of digital communication application(s) in their online course (Appendix A). From responses to the questionnaires that met the study's criteria (Appendix B), the researcher emailed the online class instructor to set-up individual meetings, in the online class instructor's office, to discuss the study with potential participants. Once it was determined that the course met the study's criteria and the participant volunteered for the study the participant signed a written consent form (Appendix C).

Selection of online students.

All online students enrolled in the four selected courses were informed of the overall research study. The researcher emailed the students about the study with the informed consent form and asked for an electronic approval of his or her participation in the study as approved by the IRB (Appendix D).

For the study, the students being interviewed were purposively selected based on the number of online courses they have participated in for educational purposes. A maximum of two students were selected to be interviewed from each of the four courses. The actual number of students interviewed in each course differed by the number of students who consented to an interview. In order to reflect on the various students' experiences in online courses, a novice student, who has taken less than two online learning courses, and a veteran student, who has taken more than three online learning courses, were selected from each of the online courses. By purposively selecting novice and veteran online students the researcher tried to gain a broader view of students' perceptions of the use of digital communication applications in the online learning environment.

Due to the nature of online research and the mode of technology communication, when selecting the participants the researcher did not know demographic information about the participants; as a person named Jamie could have been either a male or a female and from various ethnicities. In selecting the students, the researcher contacted a novice and a veteran student from each of the courses via email asking them if they would like to participate in an interview (Appendix E). This process continued until one novice and one veteran student from each course consented to being interviewed.

Data Collection

Data were collected from March 2011 to July 2011. This time frame allowed students in the spring semester to become familiar with the technology for the class since it takes most students four weeks to become comfortable with the technology in an online

course (Conrad & Donaldson, 2004). The summer semester online course was a four-week course.

The study used qualitative research methods, which are associated with the naturalistic paradigm, consisting of four data sources: interviews with online class instructors and online students, journaling, observing the online course, and collecting artifacts including the textbooks, course syllabi, digital screen shots of online courses pages and various forms of assessment. Through the use of these methods, the researcher gained a better understanding of digital communication applications situated in the societal and individual context and began to construct new realities in order to enhance the knowledge for all stakeholders.

Interviews.

The interviewing process consisted of interviewing the online class instructors and based on the number of students who consented to be interviewed, up to two students in each course. As noted by Kvale (1996), “The interview is a stage upon which knowledge is constructed through the interaction of interviewer and interviewee roles” (p. 127). For the study there were nine interviews, four online class instructors and five online students. Each interview lasted approximately thirty minutes. The interviews were audio recorded and the tapes were transcribed for analysis.

Online class instructor interview.

The online class instructors were interviewed at the beginning of the study. By interviewing the online class instructors of the courses in the study, the researcher was

able to gain knowledge about the design of their online course. The online class instructors were asked the following questions:

1. How many online courses have you taught?
2. What different online courses have you taught?
3. What are your views on teaching online courses?
4. What are your views about the use of digital communication applications in online courses?
5. What various forms of digital communication applications have you incorporated in teaching online courses? And why? Please give examples.
6. Why did you select these particular (list digital communication applications) for this particular course? Please give examples.
7. Do you have any other thoughts you would like to share?

Online students interview.

The online students were interviewed after finals were completed. The timing allowed the students the opportunity to experience the use of the digital communication applications in the online course and then to be able to discuss their experiences. By interviewing the students in the courses, the researcher gained a better understanding of the students' perceptions of the use of digital communication applications in the online courses. Due to the various locations where the participants may live, each of the students' interviews were conducted via the various modes of communication that were used in the online course including telephone and face-to-face. The students were asked the following questions.

1. How many online courses have you taken?
2. What different online classes have you taken?
3. What are your views on taking online courses?
4. What various forms of digital communication applications have been incorporated in the online courses you have taken?
5. What are your views on how the digital communication applications were used in the online courses?
6. Do you have any other thoughts you would like to share?

Journaling.

During this study, the researcher kept an electronic journal for recording observations, field notes and for documenting experiences of course activities, and individual reflections. The journal technique assisted the researcher with the research methodology, process, and findings and assisted in establishing trustworthiness of the study including “the establishment of credibility, transferability dependability and conformability” (Lincoln & Guba, 1985, p. 327). The researcher made entries in the journal throughout the study, allowing the researcher to have electronic documentation of the various activities and communications. Also, the information from the electronic journal was used to triangulate with other data in the study in order to provide a thick description of the nature of digital communication applications in the online learning environment.

Observations.

Since there are limitations to what one may discover through interviews, observation may assist in understanding the complexities of the phenomenon (Patton, 2002). Due to the differences in the atmosphere with the lack of physical presence and the electronic transmission of information in online learning environments, the mode of observation is also different than in a traditional learning environment. For the study the researcher observed the online courses during the Spring 2011 and Summer 2011 semesters via the Internet through the university's CMS. Through this observation, the researcher was able to explore the students' interactions with the various digital communication applications, for example, by viewing a course's Wimba classroom or students' VoiceThread presentations or other forms of digital communication applications used in the course. The type of observation for each course differed based on the digital communication application(s) used in the course. If a course used VoiceThread, which allows students to post presentations and for other students to post audio or text comments about the presentation, the researcher logged into the course's CMS site and observed the asynchronous interactions among the participants. If a course used Wimba, which is a real-time virtual classroom delivered via the Internet designed for distance education, the researcher logged into the course's CMS site and observed synchronous interaction among the users.

The researcher had access to all four of the online courses. Each week during the study for an hour the researcher observed each of the online courses by logging into each online course's website. This allowed the researcher to observe the use of the digital communication applications used that week in each of the courses. Due to the digital

component used during the observation, data were recorded via digital screen shots of the online course and field notes were recorded in an electronic journal.

Artifacts.

Gathering artifacts allowed the researcher to gain insight into the design of the course. As noted by Patton (2002), “Documents prove valuable not only what can be learned directly from them but also as a stimulus for paths of inquiry that can be pursued only through direct observation and interviewing” (p. 294). The following artifacts were reviewed in order to assist with other aspects of the data collection and to analyze the findings.

- Textbooks
- Course syllabi
- Digital screen shots of online course pages
- Various forms of student assessment including reflection papers

In the consent forms both the online class instructor and students were informed of the types of artifacts that were collected for the study. Digital screen shots of the online course pages obtained through observation included the use of the digital communication applications and various forms of assessment.

Data Analysis

Due to the various modes of communication throughout the data collection process, all data collected were transcribed either into written format or made into digital screen shots in order to analyze. Inductive analysis was used for data analysis. Inductive analysis allows for “important analysis dimensions to emerge from patterns found in the

case under study without presupposing in advance what the important dimensions will be” (Patton, 2002, p. 56). In order to look for emergent categories the data were analyzed using Erlandson et al., (1993) emergent category designation process of:

1. Reading the first unit of data and coding the first entry in the first category.
2. Reading the second unit to determine if the content has the same tacit feel and add to either the first category or create a second category.
3. Continue the process with steps one and two until all units fit into a category or are placed into a miscellaneous category.
4. Develop category titles or descriptive sentences or both that distinguish each category from the others.
5. Begin the process over in order to allow new categories to emerge. This process was done over fifty times in order to answer the research questions.

(Erlandson et al., 1993, p. 118)

For the emergent category designations, the researcher used both NVivo software and notecards as a secondary source. The software allowed the researcher to electronically record the data, categorize the data electronically into the emerging category folders and analyze the data using the emergent category designation process.

During the data analysis process, due to the categories that began to emerge the researcher added an additional course to the study in the summer semester in order to continue to gain additional insight. Once the data had been analyzed, the various data sources were triangulated to examine key experiences and develop common categories.

Based on the analysis of the data, the findings provided written details of the function of digital communication applications in the online learning environment, how online class instructors decide which digital communication application(s) to incorporate into their online course(s), and students' perceptions of digital communication applications in the online course(s) they have taken.

Trustworthiness

To add rigor to the study, trustworthiness was established “by the use of techniques that provide truth value through credibility, application through transferability, consistency through dependability, and neutrality through conformability” (Erlandson et al., 1993, p. 132). In order to provide trustworthiness there were several techniques the researcher used for the study. To “build trust and rapport with the respondents” (Erlandson et al., 1993) there was *prolonged engagement* with the researcher having access to the online courses' websites for five months during both the data collection and the data analysis process. The researcher conducted *persistent observation* for the last eight weeks of the spring course and the entire four weeks of summer course in order to seek out emergent categories and in-depth information. The data were triangulated in order to verify the data. *Triangulation* is used to “enhance meaning through multiple sources and provide for thick description” (Erlandson et al., 1993, p. 115). The triangulation of the data also helped to show validity in the study (Patton, 2002). The researcher obtained *referential adequacy material*, documents and online videos, used in the courses in order to gain additional insight into the courses. The researcher conducted *peer debriefings* with others including those in the Office of Online Learning about the emergent design of the study. The researcher *purposively selected* the

online class instructors based on the criteria relevant to the study. And the NVivo software provided a digital *audit trail* through planning, organizing and recording the data collected by categories.

Table 2

Trustworthiness Table

Techniques	Results	Examples
Prolonged Engagement	Creditability	Learned the culture of the online courses through observing the spring courses for eight weeks and the summer course and four weeks.
Persistent Observation	Obtain in-depth data Obtain accurate data Sort relevancies from irrelevance	During the study each week for an hour observed the weekly interactions in the online course.
Triangulation	Verify Data	Used multiple sources including artifacts, journaling, observations and interview transcripts.
Referential Adequacy Material	Obtain relevant material	Obtained copies of all written material for the course including the syllabus, assignments, textbook and tests.
Peer Debriefing	Validate Study	Met with a colleague before the study began to gain additional insight and after the data had been analyzed to discuss emerging themes.
Purposively Selected	Relevance	Online class instructors and online students were selected based on the same criteria of the study.
Audit Trail	Dependability and Conformability	Used NVivo software to categories data.

By incorporating these techniques into the study the researcher provided rigor and trustworthiness to the study.

Ethical Concerns

The ethical standards of informed consent, full disclosure and confidentiality were addressed with each participant. Each participant received an informed consent form with full written details of the nature of the study (Appendices C & D). To maintain the ethical standards of confidentiality to the participants, each participant was given a pseudonym. Due to the proximity of the researcher to the participants and since information will be shared with others who might know the participants; when communicating the findings no information is used that would directly identify the specific student or online class instructor. Also, in order to provide confidentiality and prevent the possibility of the online class instructor coercing students to participate in the study, the researcher did not provide the online class instructors the names of the students who consented to the study.

The participants were informed that due to the sensitive nature of the subject matter, the researcher owned all data in order to provide confidentiality. In the initial interview with the online class instructors, the researcher addressed the sensitive nature of the data collected including students assignments and tests. The data collected over the Internet and the data stored on the computer were secured by password protected Internet connections and computers. During the study, written material was stored in a locked filing cabinet located in the researcher's office. Once the dissertation was approved, all research data were destroyed.

Summary

The research methodology used in this study was naturalistic inquiry. Naturalistic inquiry is based on the axioms of the naturalist paradigm. The research study used qualitative methods in order to gain a better understanding of the notion of digital communication applications in the online learning environment. The qualitative research methods for the study consisted of interviewing, journaling, observing the online courses and collecting artifacts.

CHAPTER IV

FINDINGS

As innovative technology continues to emerge, the use of the technology in the online learning environment needs to be explored (Valetsianos, 2010). This study explored the functions of digital communication applications in the online learning environment, the ways online class instructors decided to incorporate digital communication applications in their online course, and students' perceptions of digital communication applications in the course(s) they have taken.

Due to the difference in the transmission of information and the atmosphere of the online learning environment, student interactions can be hard to cultivate. Online scholars believe in order for students to be effective in an online learning environment, interaction is important (Conrad & Donaldson, 2004; Draves, 2000; Kearsley, 2000; Palloff & Pratt, 1999, 2001, 2005, 2007; Sims et al., 2002; West & West, 2009). In order to create interaction, some online class instructors are incorporating digital communication applications. Digital communication applications are various types of technology

platforms that allow people to interact with one another via the Internet through asynchronous or synchronous modes of communication.

Using Vygotsky's constructivist theory (1978) based on the notion that social interaction plays a fundamental role in the learning process, this study looked at four online courses where the online class instructors used digital communication applications to try and provide learner-centered online learning environments. Throughout the study, in each of the four online courses, I observed the use of the various types of digital communication applications in the online learning environment, interviewed the online class instructors about their views on online education and how they incorporate various types of digital communication applications into their online courses, interviewed online students who were enrolled in the online courses about their experience and perceptions of the various types of digital communication applications in the online learning environment, reviewed artifacts and course assignments that used digital communication applications, and used the CMS tracking tool to review students' usage of the CMS communication tools and where applicable tracked their usage of the digital communication applications that were used in the course.

Through the data analysis process (Erlandson et al., 1993) emergent category designation, categories began to emerge in order to answer the following research question and sub questions:

Research Question

- What is the function of digital communication applications in the online learning environment?

Sub Questions

- How do online class instructors decide which digital communication application(s) to incorporate into their online course(s)?
- What are students' perceptions of digital communication applications in the online course(s) they have taken?

Study Participants

Online Class Instructors

For the study there were four online class instructors who consented to participate after being purposefully selected based on the recommendations of the university's Office of Online Learning according to the following criteria: 1. the teaching philosophy of the online class instructor was judged to be learner-centered with the class designed to allow students to be active participants in the learning experiences instead of passive recipients, and 2. the online class instructors used digital communication application(s) in the course to try and create a learner-centered online learning environment. From the meetings with the online class instructors, I selected three online class instructors based on a combination of these two criteria and the different types of digital communication applications used in their online courses. As categories began to emerge from the data, I decided to add an additional online course in the summer session in order to gain further insight. The selection process of the additional summer online class instructor was the same as it had been for the three spring online class instructors.

The following are the online class instructors who participated in the study.

Sandy – Law Course.

Sandy has her doctorate degree and has taught in the online learning environment for twelve years. Sandy is a proponent of online education and likes to test different types of digital communication applications in her online courses. She has attended and presented at various online learning environment conferences. Sandy also works with the Office of Online Learning as an evaluator of all new online courses at the university. As an evaluator she confirms that the overall design of each course meets the university's online standard guidelines and as needed makes recommendations to other online class instructors. In the various courses she has designed and taught, Sandy has used several different types of digital communication applications including: avatars, online games, Second Life, Skype, TokBox, Wimba, VoiceThread, online content videos, instructor-made videos and GoogleTalk.

The Law course she taught for the study had both undergraduate and graduate students enrolled in it. Since there are several online law degree programs in the United States, the university offers a combination of traditional and online courses in order to stay competitive. Sandy has taught and designed various types of legal online courses. For the course in the study, Sandy used various types of digital communication applications: Wimba, GoogleTalk, VoiceThread, online content videos, instructor-made videos and avatars. In the course, Sandy used Wimba for an online office hour each week. Students also contacted her through GoogleTalk, via email, chat, phone or set-up an appointment. At the end of the semester, each graduate student created a VoiceThread presentation and all students were able to watch and make comments to the presentations. Sandy believes with the new digital communication applications that have become

available over the last few years, she can offer students much more than she can in a face-to-face class because the applications provide students additional resources that they can use in order to be active participants in the learning process.

Trish – Business Communication Methods Course.

Trish has her doctorate degree and this was her first semester teaching in the online learning environment. The Business Communication Methods course was taught during the summer semester. For the study, Trish used two types of digital communication applications: a Blog and online content videos. Before designing the course Trish spoke with several students about their thoughts on online courses. The students told her, “They like it (the course design) to be easy to decipher, really organized, not overwhelming.” Although Trish had originally designed her course with various digital communication applications including an instructor-made welcome video, for her first online course, she scaled it down in order to test what is effective and what is not effective. For the online course in the study, she used some of the same digital communication applications that have been effective in her traditional courses, such as, online content videos and a Blog. The online content videos for the course were used because they related to the topic and created good discussion points. The Blog was also used because it allowed students to post comments and was easy to navigate to since the link was embedded into the course. Although Trish does not have set online office hours for the summer semester, she checked her emails multiple times a day and encouraged her students to set-up appointments to meet with her, call her, or chat with her when she is logged into the course. In the fall Trish will begin to design a new online course.

Beth – Language Speaking Course.

Beth has her doctorate degree and has taught in the online learning environment for three years. Beth has also attended and presented at online learning conferences.

Beth stated that:

the technical elements of the (online) class sometimes create barriers for the students because they're not familiar with them and they can't just show up for class with their books and start the class. (Interview, March 2011)

In order to help students with the technical elements, Beth has a set time each week when students may call, email or stop by and visit her during office hours.

In the course, Language Speaking, Beth used various types of digital communication applications during the study: Skype, online content videos, an instructor-made video and a digital workbook. Beth used a digital workbook into which students log into the website. The digital workbook has various activities including recording answers and writing answers to questions and links to online content videos. Skype was used in the course in order for students to be able to practice speaking with one another through formal and informal conversation online. Beth also set up times each semester to talk with each student via Skype and conducted oral finals via Skype. Through the use of Skype, Beth believes she is able to interact more one on one with students than she is able to in her traditional courses. She stated in her interview that she believes the use of Skype: *enhances the experience, makes it so much more personal for me to get to know the students and also them to know me (Interview, March 2011).*

Ali – Written Language Course.

Ali is in the process of earning a doctorate degree and in the past ten years she has taught over one hundred online courses and has designed thirteen different online courses at various colleges and universities. Ali is very passionate about online learning and how to effectively use digital communication applications in the online learning environment. In the past Ali worked for the Office of Online Learning at a university and assisted other online class instructors in designing courses. Each year she attends and speaks at various online learning conferences.

In her various online courses, she has used several different types of digital communication applications, such as, avatars, Wimba, GoogleTalk, online content videos and Skype. In the course studied here, Written Language, Ali used an avatar during the semester in order to create interactions with her students and discuss upcoming assignments. Ali sets aside time each week for online office hours where students are able to contact her or stop by to meet with her. Although she does not have a set meeting place online, she sometimes will Skype students and/or uses the Webcam on her computer in order to help guide students to find information about a project or to review one of their assignments. In her interview, Ali noted one reason she no longer use lots of different types of digital communication applications is because:

Someone is always going to get lost...you can have 22 out of 25 students get it, but you still have three that don't and then you are spending time and they are not benefiting from something so I just scrapped it all the last couple of years. I am very sparse on it. I don't use a lot of technology. (Interview, March 2011)

So in her course she now only uses an avatar to create various types of interactions with the students.

Online Students

In each of the four online courses, students were asked to consent to be a participant in the study. For this study from each of the online courses, five novice students and four veteran students were observed and three novice and two veteran students consented to be interviewed at the end of the semester. The difference between a novice and a veteran student was based on the following criteria: a novice (N) is a student who has taken fewer than two online learning courses and a veteran (V) is a student who has taken more than three online learning courses.

Law Course.

The Law course is an upper division course that is required for all of the degree majors and was taught in the spring semester. From the Law course three students consented to participate in the study: Angie and Misty, both novice students, and Adam, a veteran student. Of the three participants, only one novice student, Angie, consented to an interview but the all the participants were observed. For the course, the online class instructor used Wimba, GoogleTalk, VoiceThread, online content videos, instructor-made videos and an avatar.

Angie (N).

Angie is a novice online student who has also taken a math course online. Angie was the only student who participated in the study who was not a net generation student (born between January 1977 and December 1997). Angie works on campus and is an

upperclassman majoring in pre-law. Along with school and work, Angie is also married and has children in high school. Her previous online math class did not use any other form of digital communication applications. Angie believed the use of VoiceThread and videos were effective in the Law course. In the course she was one of the six students in the course who used VoiceThread, for extra credit, and listened to and made a comment about another student's presentation. The interview was conducted via telephone and during the interview, Angie noted that she believes online courses are as good as traditional courses and has enrolled in another Law online course for the summer semester.

Misty (N).

This course was Misty's first online course. She actively participated in the course and often posted questions or replied back to other student's questions on the course's question and answer forum. Although, students received extra credit for making comments on the VoiceThread discussion board, Misty did not use this application to participate in the discussion. Misty did not respond back to the email that requested her consent to an interview.

Adam (V).

Adam is a veteran online student. For the course, he completed all of his assignments but was not active in the discussion portion of the course. Although, students received extra credit for making comments on the VoiceThread discussion board, Adam did not use this application to participate in the discussion. For the summer semester, Adam enrolled in another Law online course. Adam did not respond back to the email that requested his consent to an interview.

Business Communication Methods Course.

The Business Communication Methods course is an upper division course that is required for all of the degree majors and was taught in the summer semester. From the Business Communication Methods course, two students consented to participate in the study: Leah and Mark. Both students, one veteran, Leah, and one novice, Mark, consented to an interview, but only one of the students consented to be audiotaped in the interview portion. The online class instructor for the course used a Blog and online content videos in the course.

Leah (V).

Leah is a veteran online student and has taken four online courses including other communication courses and a math course. Leah works on campus and is an upperclassman majoring in business. Leah has a very busy life with taking classes, working on campus, and taking care of her husband and dogs. In her previous online courses, she was told they were going to use Wimba and Skype, but the only digital communication applications used in those courses were online content videos and instructor-made introduction videos. Throughout the Business Communications Methods course, Leah was very active on the discussion board but her only comment on the course Blog was to introduce herself to the other students. Leah believes she has learned more in some of her online course than she has in her traditional courses and in her interview (Interview, June 2011) stated *I love where technology is going for online classes* and said she would enroll in more online classes. The interview was conducted via face-to-face on the university's campus and was scheduled around her work schedule.

Mark (N).

Mark is a novice online student who has also taken a language online course. Mark is a senior marketing major. Last year, I had Mark in one of my traditional courses. Although his previous online course did not use any digital communication applications, a type of digital communication application he thought was most effective was an instructor-made video that one of his professors in a traditional class posted on the course's CMS site when class was canceled because of inclement weather. Mark liked the instructor-made video because he could watch it on his own time and it gave information about the content of the course as if he were in the classroom. In the Business Communication Methods course on the discussion board and Blog, Mark was an active participant but contributed the minimum amount for the grade. Mark believes that online courses can be as effective as traditional courses but that it depends on the learning style of the student. His interview was conducted via telephone but Mark did not consent to be audio taped. In the fall, Mark plans to take another business online course.

Language Speaking Course.

The Language Speaking course is an introduction general education course and was taught in the spring semester. For the Language Speaking course four students consented to participate in the study: Jen, Chris, Cathy and Bryan. Of the four, one veteran student, Jen, and one novice student, Chris, consented to an interview but all the participants were observed. For the course the online instructor used Skype, online content videos, an instructor-made video and a digital workbook.

Jen (V).

Jen is a veteran online student and has taken seven online courses. Jen's favorite online courses were other general education courses because she was familiar with the topics from high school. But her least favorite course was the Language Speaking course because she was not familiar with the information in advance. Her previous online courses have used online content videos but not any other types of digital communication applications. Jen was very active in the online course and would ask and answer various course related questions on the class question & answer link. For this course, she completed all of her Skype activities but instead of using Skype for all the assignments, most of the time, she would email, call or meet her assigned Skype partners to work on the assignment. Jen had used Skype in the past and said it was frustrating when other students did not know how to use Skype. For the course, she did not use her personal Skype name but created another account to use for the online course. Jen did enjoy using Skype with the online class instructor for the final oral exam because if she had trouble pronouncing a word she could see and hear the online class instructor say it. The interview was conducted via telephone. On the day of her interview, Jen had forgotten about it so we rescheduled it for the next day. The next day she forgot again but when I sent her an email to see if she wanted to reschedule she called me about an hour later to do the interview. In her interview, Jen said even though she will be graduating soon, she is still open to taking online courses but it would depend on the subject.

Chris (N).

Chris, a novice online student, is a junior business major who has taken a hybrid business course and an online business course. In the semester of the study, I had Chris

in one of my traditional classes. Chris was extremely active in my course and even showed up on inclement weather days when few students showed up. He worked well in groups and classmates voted his group's final project as one of the best presentations. Chris was active in the traditional course but he fell behind in the Language Speaking course and dropped the course toward the end of the semester in order not to receive a failing grade, although he had consented to be a participant in the study. He claimed that, *I opened it once or twice and actually forgot that I was not on the waiting list and was enrolled in it and by the time I realized it I was too far behind (Interview, May 2011).*

Chris does not believe that either online or traditional courses are better than the other but each format is just a different way to learn the material. In the fall, Chris plans to take a different Language Speaking course and wished that the course were available online because he had taken a class with that content in high school and believes he would have a better understanding of the content, which would help in the online learning environment. Although Chris dropped the course towards the end of the semester, based on being a novice student and his experience with the use of digital communication applications in the online learning environment, he was asked to consent to an interview. The interview was conducted via telephone. The interview was to be conducted face-to-face on campus but at the time of the interview, Chris called instead of meeting for the interview.

Cathy (V).

Cathy was new to the content of the course. She was active in the course and would post questions to the class question and answer link in order to receive clarification on assignments and due dates. One of the questions she posted was needing help on

determining who her Skype partner was on an assignment that was due the next day. Although, Cathy was active in the class she did not complete one of the Skype assignments with her partner.

Bryan (N).

This was Bryan's first online course. He was taking the course in order to become familiar with how to speak different languages when traveling with his wife. Throughout the semester, he was average in relation to others in his participation in class discussion. He completed all of his Skype assignments except for one of the assignments with his partner. Bryan did not respond back to the email that requested his consent to an interview.

Written Language Course.

The Written Language course is an upper level course that is a required course for all language students and other degree programs including pre-law and was taught in the spring semester. For the course, the online class instructor used an avatar. Although all of the students in the Written Language course were asked by email to be a participant in the study, none of the students consented to the study. Therefore, because none of the students consented to the study, there were no interviews conducted.

Categories

Through the data analysis process categories began to develop in order to answer the study's research questions.

Research Question: What is the function of digital communication applications in the online learning environment?

Based on the data collected from interviewing the online class instructors, observing the online courses and reviewing the artifacts, the common functions of digital communication applications in the online learning environment were: to create instructor to student interaction, student to content interaction and student-to-student interaction. The digital communication applications used by the online class instructors in their online courses included: Wimba, GoogleTalk, VoiceThread, online content videos, instructor-made videos, avatars, digital workbook, Skype and a Blog. Each of the digital communication applications offered different types of interaction in the online courses.

Category 1 – Instructor to student interaction.

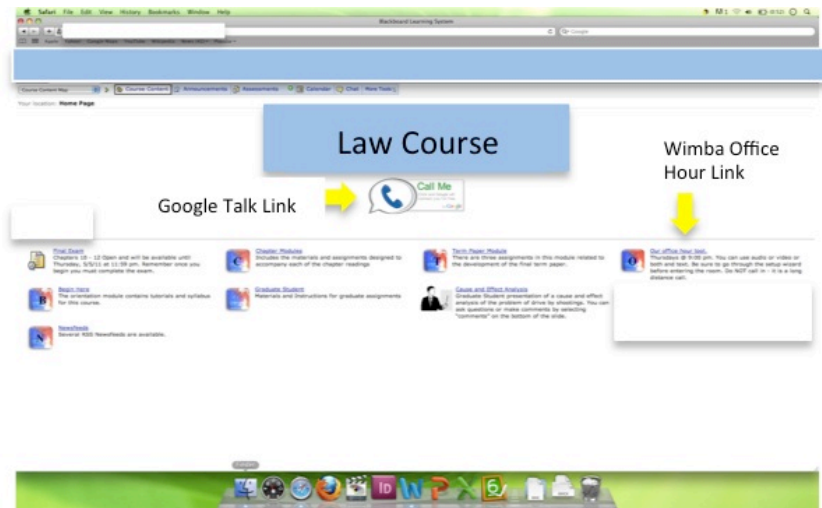
Online class instructors play an important role in students' satisfaction of an online course (Bolliger & Martindale, 2004). In the study, each of the four online class instructors incorporated different types of digital communication applications in order to create various types of instructor to student interactions.

Sandy.

For Sandy's online Law course, she used Wimba, GoogleTalk, instructor-made video, an avatar, CMS mail tool, announcements, class question and answer link, telephone and on-campus office appointments in order to create interactions with students. For students to have easy access to contact her, on the course's CMS home page there was a link students could click on to be directed to the course's Wimba office hour page and a link students could click on to contact her via GoogleTalk (See Figure 2).

Figure 2

Wimba and GoogleTalk Link on Law Course Home Page



In order for students to be able to interact with her one on one, each week Sandy had one hour of office time via Wimba. Sandy used Wimba for an online office hour each week instead of having typical online office hours, where online class instructors logged into the course's CMS site and are available to interact with students via chat or email. Instead of being in her office on campus during the online office hour, she was at her home office and used a webcam and headphones with a microphone attached for students to be able to see and hear her. When she used the video portion of Wimba, you can see her sitting at her home office desk with the door open to the hallway. Sometimes in the hallway you could see her dogs walking by which she believes gives a human touch to the online learning environment. The office hour was conducted at home because the online office hour was once a week from 9-10 pm (which according to the CMS tracking

report is the most active time of the day for the course). The day of the week was the same each week and that day was selected because it was before most of the weekly assignments were due (CMS tracking system does not report the most active day for the course).

In her interview Sandy discussed the advantages of Wimba as allowing for two-way video and audio and allowing online students who are unable to come to campus during normal office hours the same opportunity as other students. Sandy noted in her interview that:

I use Wimba because I think that's one thing that students miss, whether they admit it or not, is they don't see me. With Wimba they can see my face frowning or my face smiling...my encouragement because it's all facial expression and it really answers that question. (Interview, March 2011)

Sandy also discussed that students were not actively using Wimba and noted that it is the same with traditional office hours where most students may decide to email instead of stopping by the office.

Based on the CMS tracking information, Wimba was not used much by students except at the beginning of the semester. Throughout the sixteen week semester there were twenty times students used Wimba with the total amount of time for all the sessions in the spring semester course being nineteen minutes and twenty-nine seconds. Of those twenty sessions, ten of them were during the first three weeks and only three of those ten were during the office times, the others were when students were clicking on the link for a couple of seconds to look at it during orientation. The most significant use of Wimba was

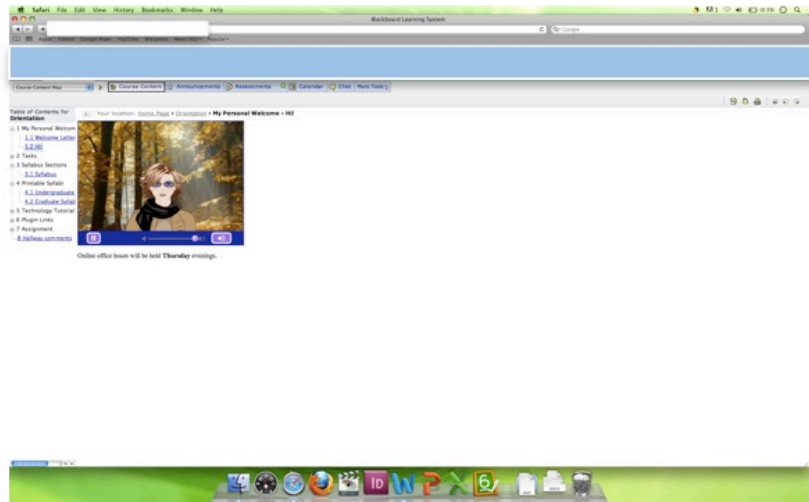
during the second week of school when a student logged into Wimba for fourteen minutes and four seconds during the office hour. So although students were interested in Wimba and clicking on the link to find out about it, it was not used overall in order to have interaction with the online class instructor. In her interview, Sandy did tell stories about students knowing she was online during her Wimba office hour and instead of using Wimba would send her email or a chat invitation. Although few students used Wimba, students knew they could reach her during that time and Sandy plans to continue to use Wimba in order to have a presence in her online course.

Mid-semester Sandy also decided to incorporate GoogleTalk into her course because, *it allowed students who were not on campus the opportunity to talk to her if they need to (Interview, March 2011)*. Instead of giving out personal phone numbers to students, a student is able to click on the GoogleTalk link and type in their name and phone number. GoogleTalk then directs the call to the online class instructor. For Sandy, GoogleTalk would call her home, office and cell phone number. Throughout the study based on the CMS tracking information there were seven times students clicked on the GoogleTalk link. There is no data on how many students placed a call once they clicked on the link.

In her interview, Sandy discussed the importance at the beginning of the semester that all online class instructors use some type of video, avatar or picture so that the students can begin to identify and interact with them. To begin and create instructor to student interaction in her Law course, the first week of class and throughout the semester, Sandy used an avatar (See Figure 3).

Figure 3

Avatar Used in Law Course



For the beginning of the spring semester, which began in January, the avatar is dressed in winter clothes. The avatar used Sandy's voice and welcomed students to the course and told them an overview of where to find the syllabus, tutorials, the group assignments and how to contact her. The welcome avatar according to the CMS tracking system information was watched forty six times, which is almost twice the amount of students who were enrolled in the course.

The use of the avatar to create instructor to student interaction can be told in a story Sandy mentioned in her interview about a student who recognized her from her avatar:

I was in the hallway by the pop machine, a student came in from the north side by the north door and walked up to me and said, "Are you Dr. Sandy?" "I said yes," and student smiled and said, "I recognized you from your avatar."

(Interview, March 2011)

Sandy believes by allowing students to be able to interact with her in the online learning environment it creates a positive relationship between the student and the online class instructor.

Trish.

For Trish's online course, she used different types of communication in order to create interactions with students including a Blog, CMS mail tool, announcements, class question and answer link, telephone and on-campus office appointments. Trish decided to select multiple ways for students to be able to contact her because she wanted students to feel comfortable contacting her and because she did not want students to be frustrated when they can't complete an assignment simply because they could not reach her to answer a question. In her interview, Trish stated:

In an online class they should be able to get hold of you every day, and I know we're not taught to do that seven days a week. But I'm checking mine seven days a week and I'm going to be live at least a couple of hours a day. But I respond to their mail as soon as I can. I told them it's always going to be within a few hours. (Interview, June 2011)

In the Business Communication Methods course, Trish introduced herself and the course to the students by using a Blog and posting a photo of herself. She believes the use of the

Blog allows students to interact with her as she posts her thoughts and comments throughout the semester. Although Trish used the Blog as a way to express her thoughts and ideas to students, her main form of instructor to student interaction was through the traditional CMS tools such as announcements and email.

Beth.

For Beth's online course, she used different types of communication in order to create interaction with students including an instructor-made welcome video, Skype, CMS mail tool, announcements, class question and answer link, telephone and on campus office appointments.

To begin to create instructor to student interaction at the beginning of the course, Beth used an instructor-made video of her interacting with students in her traditional course. Beth believes the instructor-made welcome video allowed the online students the opportunity to get a sense of how she interacts with students and allowed the online students the opportunity to see what types of activities they will be doing throughout the semester. She does not use other types of instructor-made videos in the course because she said her class is not set-up as a lecture format but more practical application.

In her online course, Beth also used Skype in order to create instructor to student interaction through informal one-on-one conversations and during their final oral exam. To inform students about Skype being used for instructor to student interaction in the orientation module, it stated:

Every other week, you will SKYPE with me in an informal conversation. This is a time to ask me individual questions and to work on pronunciation. You are

welcome to post questions on the Course Q&A board at any time! I will respond within 24 hours. (Interview, March 2011)

In her interview, Beth talked about the benefits of having informational conversation with her online students and stated because of these informal Skype sessions she has, *more one-on-one time with (her) online students than I have with my traditional (students) (Interview, March 2011)*. The use of Skype also assists with the final oral exam because instead of just having students record the information and posting it for her to grade she is able to interact with them and answer questions. Overall, Beth believes Skype is effective in creating instructor to student interaction because *it's not a robot teaching the class or a computer screen teaching the class, but a person who is interacting with them...and in a live interaction it is more immediate for them (Interview, March 2011)*.

By using welcome instructor-made videos and Skype in her course for assignments and every other week informal conversations, Beth is able to have interaction with her students.

Ali.

For Ali's online course, she used different types of communication in order to create interaction with students including an avatar, CMS mail tool, announcements, class question and answer link, telephone and on-campus office appointments. In her interview, Ali discussed that she did not use many digital communication applications in the course to speak to the entire class because the course is more individual writing and she communicated with students a lot individually on their assignments through WebCT tools such as email. In order to begin to create social interactions with students, Ali used

an avatar the first week of class to introduce herself. The main reason she used the avatar the first week is for students to know she is a female instead of a male because her name is neutral. In the past, some of her online students thought Ali was a male, and would address email Mr. Ali, because of the countries where the students were from her name was used for men. Ali also used the avatar three other times during the semester in order to update students about the course content and assignments and direct them to her if they had any questions.

During the study, each of the online class instructors used different types of digital communication applications in the online courses including: Wimba for weekly office hours; GoogleTalk starting mid-semester for students to call the online class instructor; a Blog with five post throughout the semester; Skype for every other week informal conversations; avatars for welcome introduction of the course; and instructor-made videos for welcome introduction of the course in order to create instructor to student interaction.

Category 2 - Student to content interaction.

Due to the differences in the transmission of information in the online learning environment, the interactions students have with content can be different because they are unable to physically interact by using their senses of speaking, hearing, touching, smelling or tasting. For this study each of the online class instructors incorporated different types of digital communication applications in order to create student to content interaction.

Sandy.

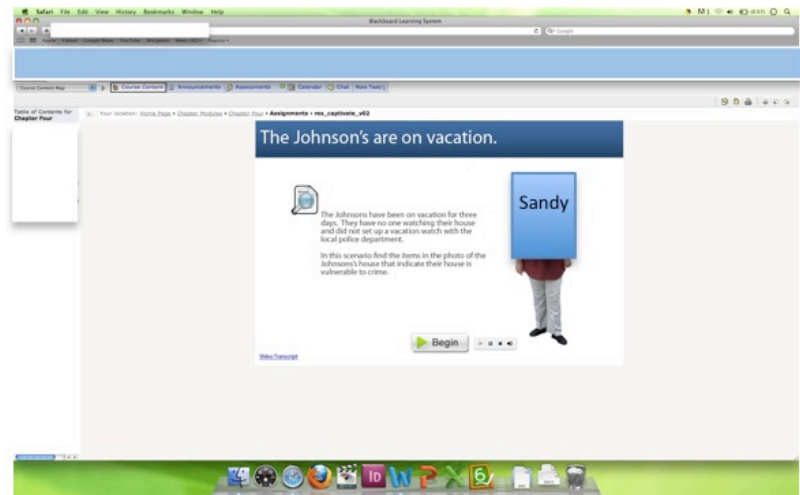
In her interview Sandy noted that with the advancement of technology, *you can ask them (students) to do more things...and maybe think beyond just the content that's being discussed (Interview, March 2011)*. For her online course in order to create student to content interaction, Sandy used various types of videos including instructor-made videos and online content videos. Through the use of different types of videos in her courses, Sandy tries enhance the learning experiences for her students. As Sandy noted in her interview:

I think the thing is to go beyond just providing information and ask for discussions. I think you have to think about websites that might be useful. Give them ways to get outside of the textbook. (Interview, March 2011)

In her course, she had three instructor-made videos. In making the instructor-made videos, she tried to *make it personal by explaining some points in a chapter, summarizing the last chapter, or commenting on their assignments, how well they did or how well they didn't do (Interview, March 2011)*. In this instructor-made video clip below, Sandy explained the topic and had student relate the content from their assigned reading to a scenario that she described to the students. By using their mouse to click on possible outcomes, students were able to interact with the content.

Figure 4

Instructor-Made Video Used in Law Course



This type of communication application allowed the student to see, hear and “touch” the content that is related to the online course.

As well as using instructor-made videos, Sandy used various online content videos that are posted on various websites including YouTube. Sandy believes the uses of online content videos enhances the student’s learning experience overall because:

students are able to watch them at their own time...and you are able to offer them more...even if they only click on two of those outside links and just take a look at the website...they’ve added more than they probably would in a classroom environment where videos are not used. (Interview, March 2011)

By using instructor-made videos and online content videos in her online course, Sandy is able to provide various opportunities for student to interact with the content.

Trish.

In her online course, Trish used the Blog and online content videos as a way to create student to content interaction. On the introduction Blog she posted *I'll use the Blog to give you feedback on how the course is going, discuss something from current events or share case studies, some of which will come from you. Be sure you read it regularly.* The use of the Blog allowed Trish to add content and to post information about current events in the news that related to business communications methods, weekly course content topics including recent CEO and political scandals.

Throughout the semester, Trish also used online content videos that related to the topics including a YouTube Video about a journalist who was filming a person drowning in rapid waters and did not try to help the victim because of the danger. After watching the video, students used the discussion board to make comments about whether the journalist should have continued to video tape the drowning or stopped videoing after it became apparent that the person might not be able to be rescued because of the rapid water. In their comments about the online content video, students related their explanation of what they believed was the best options back to the week's readings. Trish also had an assignment where students made their own online video that related to the subject and she posted the links on the Blog for students to view. This allowed students additional opportunities for other students to interact with the content through making videos and watching the student-made videos. For the course, Trish decided not to

include any instructor-made videos but noted that she planned on using instructor-made videos if she saw that students were not grasping a particular subject and/or they needed more clarification.

Beth.

For her course, Beth used a digital workbook to create interaction between students and the content. In order to create student to content interaction, the digital workbook had various assignments including pronunciation assignments where students recorded their voice and she was able to go back and listen to it. The digital workbook also provided students with various online content videos that related back to the content including people speaking different languages and the culture of different countries. Through the use of the digital workbook there were various ways for students to interact with the content.

Ali.

For her course, Ali used the avatar during various weeks of the semester in order to create student to content interaction. Through the use of the avatar she was able to try and connect the students to the course content by reminding them of how all the content of the course relates. In one of the avatar videos she stated:

Remember to continue to pay attention to connections between assignments and readings. Try not to think of each activity as a separate assignment; rather, think of them as interconnected--use one assignment/chapter to help you with the next and so on.

By emphasizing various connections among the assignments she tried to create student to

content interaction.

For the fall semester, Ali designed a new language online course. For the new course she will be using an avatar of herself and throughout the semester the avatar will use two different dialects depending on that week's course content. For example when introducing herself to the class, the avatar will use her natural southern dialect in order for students to be able to identify with her. During the vocabulary pronunciation sections of the course, the avatar will have a British accent because English is a second language to many of the students in the course and the British accent is the primary dialect these students learn when speaking English. With the British accent, the objective is for students to be able to hear the correct pronunciation of the word as it relates back to the course content.

During the study, each of the online class instructors used different types of digital communication applications in their online course including: three instructor-made videos; seven online content videos, a Blog with four post about the content, four different avatar messages and a digital workbook with various assignments in order to create instructor to content interaction.

Category 3 – Student-to-student interactions.

In order to create student-to-student interactions all of the online class instructors used the CMS discussion tool. But in order to create different types of student-to-student interactions some of the online class instructors used various forms of digital communication applications including VoiceThread, Skype and a Blog.

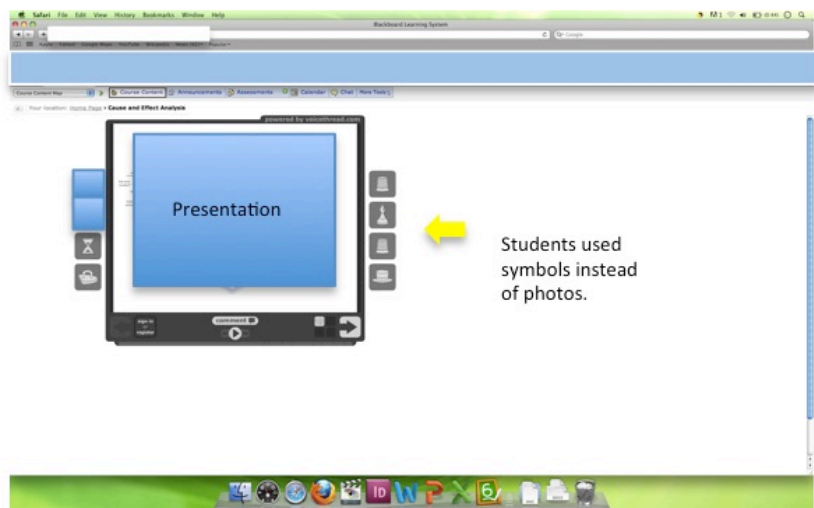
Sandy.

In her online courses, Sandy has used various types of digital communication applications including Second Life, TokBox and VoiceThread in order to create student-to-student interaction. For her Law course, Sandy only used VoiceThread as a way for students to be able to present their material to other students and for other students to be able to leave audio or text comments about the presentation. VoiceThread looks like a PowerPoint slide presentation. To post a comment, each student selects either a photo or a symbol to represent themselves and then students type or record their comment. When a student posts their comment, either an audio or text comment, their photo or symbol appears around the outside of the presentation slide. Other students then are able to click on the photo or symbol to either hear or read the student's comments.

For the Law course, the graduate students presented the material and after watching the presentation students posted comments (See Figure 5).

Figure 5

VoiceThread Used in Law Course



For example after watching a presentation one student posted the following comment to the presenter:

I really enjoyed the way that the information was presented. As someone that lives in a middleclass neighborhood, drive by shootings aren't really something that I thought about, but something that really struck me in the information provided was about location; my neighborhood is a block off the turnpike and one block off of old 66. This presentation makes what I've chosen to do for my field study seem that much more important. I hope that I can make a difference in a kid's life that will keep them from drugs and gangs.

By incorporating VoiceThread into the course students were able to interact with other students by presenting material, watching other students' presentations and posting their comments.

In some of her other online courses that required group work, Sandy has used Second Life in order to help facilitate the discussion and create student-to-student interaction. Sandy believes that:

Second Life provides an excellent space for that (group work)...all you need is someplace for them to sit down or even stand, it doesn't matter, just a place, a space. And they can talk about their stuff and they can either be text or be audio. I go in as an avatar and do exactly the same thing I was (doing) in face-to-face classes. So it's really cool. You do have to establish a time when they can all meet so you do have to kind of mess around (with) schedules but it is worth it. (Interview, March 2011)

By using different types of digital communication applications including VoiceThread and Second Life in her courses, Sandy has been able to create different types of student-to-student interactions.

Trish.

In order for students to become acquainted with the Blog and one another, Trish did an introduction Blog for her course as a way to introduce the course. She had students for bonus points post a comment on the Blog with information including their major and answer a question about what type of interaction they have had with the content of the course business communication. Of the twenty-four students originally enrolled in the course nineteen students posted an introduction of themselves. During the course, Trish also posted four other blogs, but students opted not to make comments on those posts.

Another way Trish created student-to-student interaction was for one assignment to have students create student-made video about various topics and had students send her links to the videos so that she could post the links to the videos on the Blog. Students were able to view the videos then make comments about them through the discussion board.

Beth.

Beth for her course used Skype assignments as a way for students to have interactions with one another. During the course, students had six different Skype assignments and were assigned different partners in order to complete the assignments. The Skype assignments ranged from: a problem solving assignment where one student

was given half of the information and the other student was given the other half and they had to work together in order to solve the problem; to information seeking assignments where each student had to ask the other student questions about themselves. Beth believed Skype was effective because it allowed students to do some of the same activities her traditional course students do with each other. Because it was an online learning environment, Beth noted it was hard to setup Skype partners in the online learning environment and stated:

I have to be more involved in pairing them up and then inevitably there's somebody who e-mails me and tells me, 'My partner doesn't respond to me', or 'I don't know what to do about this'. So, it's not, the success rate is not 100% on those activities and in which I don't know how it could be, but the students who want that get disappointed when their partners don't come through for them. (Interview, March 2011)

But although there can be some challenges in setting up Skype partners there are also some benefits of using Skype. In her interview, she stated in her third semester of teaching the course she was excited when she found out students were using Skype to have informal conversations with one another:

students were just getting on Skype and seeing who else was on and having a chance to chat or practice a little more outside of what they were required to do and I never entertained that happening, that was a big bonus. (Interview, March 2011)

Although it might be hard to set-up partners in the online learning environment

through the use of Skype students were able to have both informal student-to-student interactions through using the class list of students' Skype name and formal student-to-student interactions through six assignments.

Ali.

Due to the content of the course, Ali did not use any forms of digital communication applications for student-to-student interaction in her Written Language course. In the past, Ali has used different types of applications, including avatars, in assignments to create student-to-student interaction. Some of the different avatar assignments Ali has done in order to create student-to-student interaction were having students create an avatar based on historical figures or a character from a book and then having the students interact with one another using the persona of the historical figures or character from a book. This allowed students to interact with the content of the course through student-to-student interaction.

Based on interviewing the online class instructors, observing the use of the digital communication applications and reviewing the artifacts the common functions of digital communication applications in the four online courses were to create instructor to student interaction, student to content interaction, and student-to-student interactions. These types of interactions can be seen through the use of: Wimba for weekly office hours; Skype for informal conversations and assignments throughout the semester; GoogleTalk for students to be able to contact the online class instructor; VoiceThread for student presentations; Blogs for online class instructor to post information about the course and subject; avatars for introduction of the course and information about the content throughout the semester; online content videos about the content of the course; instructor-

made videos for introduction of the course and information about the content, and digital workbook with various assignments.

Sub Question 1: How do online class instructors decide which digital communication application(s) to incorporate into their online course(s)?

A digital communication application can be used for multiple functions for example, a Blog, can create instructor to student interaction, student to content interaction or student-to-student interaction. Online class instructors look at different ways to incorporate digital communication applications in their online courses. Based on the data collected from interviewing the online class instructors, observing the online courses and reviewing artifacts for this study, the common deciding factors online class instructors used to determine which digital communication application(s) to incorporate into their online course(s) were: course objectives, online class instructor's past experiences with the use of the application, and students' past learning experiences with the application.

Category 1 – Course Objectives.

Just like an instructor in traditional courses uses various methods to teach each of their courses, online class instructors use different types of digital communication applications in their online courses. In determining which type of digital communication applications to incorporate into their online courses, all of the online class instructors incorporated digital communication applications that assisted in meeting the course objectives. Since some of the online class instructors teach the course in both an online and traditional learning environment where the course objectives are the same, but the transmission of information and atmosphere is different, online class instructors must determine how to effectively meet the course objectives in the online learning

environment through CMS tools and/or digital communication applications.

Sandy.

When talking with Sandy about how she determines the different types of digital communication applications she uses in her course, she stated, *How I select what application I am going to use depends not on the course but on the content of the chapter (Interview, March 2011)*. Sandy discussed that certain chapters lend themselves better to different types of applications and gave examples such as for the history chapter she uses various links to online material because there are a lot of articles and online content videos that meet the chapter's content objective. But, for a chapter about legal issues, she might create an instructor-made video so she can emphasize some of the readings from the chapter. So, instead of using the same digital communication applications in each of her chapters, Sandy determines which application in particular will emphasize the content in order to help meet the objectives for the chapter.

Another type of digital communication application Sandy used in her course in order to meet her course objectives was VoiceThread. One of Sandy's objectives as noted in her syllabus is for students *to examine various groups in society and how those groups interact with the law*. In her course this semester, Sandy decided to incorporate VoiceThread in order for students to be able to present material about other groups in society and for other students to be able to hear, see and respond to the presentations about the various groups in society. Sandy discussed the various reasons for incorporating VoiceThread including:

VoiceThread allows them to talk about it just like they would in a classroom

presentation...and, other students can add a little clip in there and comment in response. So, it's much more like the classroom environment where you have them presenting and students asking questions or making a comment. (Interview, March 2011)

Although only the graduate students presented the material using VoiceThread, all students in the course were able to interact in the learning process by posting their comments and discussing the content with other students.

Trish.

In Trish's course in order to assist in meeting the objective: *Analyzing issues of current and historical case studies while thinking, speaking and writing critically*, she used a Blog in order to incorporate current events. In her course, one of her Blog postings included all of the newspaper headlines for a recent corporate scandal and discussed the types of questions students should be asking when working on their case studies. Trish also used different online content videos that emphasized the chapter content.

When designing her online course, Trish looked at various types of digital communication applications. It was recommended by others for her to use avatars in her course, and in her interview Trish noted that avatars can be *a great tool for explaining things (Interview, June 2011)*, but Trish decided not to use avatars in her course because of the subject content and noted that in most business communication avatars are not used to communicate and would draw away from the content being presented. Trish stated, *Now I have seen classes where they have used it (avatars) very well, but for the initial*

design of my class I decided to use more basic communication (Interview, June 2011).

So, instead of selecting several different types of digital communication applications, she selected only two types of applications, the Blog and online content videos in order to assist in meeting the course objectives. Trish noted that as she continues to work at becoming familiar with the online learning environment she will be looking to determine if there are other types of digital communication applications she can incorporate in order to reach course objectives.

Beth.

For Beth's Language Speaking course, the first learning objective listed on the course CMS site is for students: *to be able to: make short statements and ask/answer simple questions.* In her traditional course, she and the students are constantly speaking to one another in various languages as well as participating in various language speaking activities. To reach the course objective in her online course, Beth looked at ways in which students could be exposed to the language by participating in activities through both audio and visual components. In order to meet the same learning objectives in her online course, Beth incorporated Skype and a digital workbook that contains online content videos into her course. The use of Skype allowed the students to practice the pronunciation of the words and to speak the language with others in the course throughout the semester. The digital workbook included various activities where students answered questions by recording their response and posting their answers so the online class instructor could go back and listen in order to determine if they were able to communicate and speak the words. Through these digital communication applications online students were able to experience the verbal and audio components through *making*

short statements and asking/answering simple questions in order to meet the course objectives.

Although Beth was able to use digital communication applications to meet some of her course objectives, one course objective that she had a hard time meeting in the online learning environment was in regard to students' writing. In the course syllabus, another course objective is for student to be able: *to write short essays that demonstrate thoughtful organization, good grammar and vocabulary skills, and creativity*. In her interview, Beth discussed because of the ways written information is communicated via typing in the online learning environment instead of writing in their workbooks as they do in the traditional learning environment, that the process is different for the online students. She stated:

There's a whole different process that goes on when you're writing things down by hand than when you're typing. (But) because the online environment requires that they type everything, I don't see that there's a way for me to force them to write in a workbook. (Interview, March 2011)

So even though the activity is the same for students in the online and traditional courses, the process that the information is communicated in the online learning environment is different in meeting the course objective. In her course, Beth is able to use some digital communication applications to meet her course objectives but for some of her objectives she must use alternate ways to meet the course objectives that might not be as effective.

Ali.

In Ali's online course, the first objective on the CMS site is for students to: *Understand the components of technical writing and technical communication.* In her interview, Ali talked about keeping students on task so they don't fall behind in their writing assignments and to understand how each of their writing assignments relates to one another by using an avatar to speak to the students. Throughout the semester, Ali used her avatar to remind students of upcoming assignments and how they relate to one another. For example, one time the avatar said:

It is really, REALLY important that you review Chapter 16 and Week Eight module Monday through Wednesday in order to properly complete the proposal worksheet.

Through the use of the avatar, it allowed students to be able to know where they should be on their writing assignments and to have interaction with the online class instructor.

In some of her other online courses, Ali discussed how she was able to use avatars in order to meet other course objectives. In her Verbal Language course, she uses avatars in order for students to be able to see how the lips move when saying a word and even has the avatar use a British American accent so they hear the correct pronunciation of the word. In another one of her online course, she has had students use avatars in order to create different historical figures or characters out of books in order to understand the persona of the historical figure or the character. But because those types of activities do not cross over into some of her other courses, such as Written Language, students in those courses don't create avatars. Ali noted, *Because of what I teach (this semester)*

they don't need to use an avatar. They don't need a different persona (Interview, March 2011). So, although the use of a digital communication application might be effective in meeting the objectives in one course the use of a digital communication application in another course might not be effective.

When asked why she used an avatar in the course instead of instructor-made videos, Ali discussed that she likes to talk with her hands and that does not look good in videos. But, if she does not talk with her hands she looks stiff, so the avatar allows for flexibility in her the accent of her voice and movement but does not distract from the overall content of the message. In designing her courses, Ali said she, *Keeps it as simple as possible (Interview, March 2011).* She said when designing online courses, online class instructors should keep in mind what students should know by the end of the lesson. She said if, *At the end of this lesson, they're going to know what a thesis statement is. All you focus on should be on a thesis statement, you don't need a YouTube video to teach with all of the time (Interview, March 2011).* By incorporating effective digital communication applications that relates to the content into the course, Ali is able to help students in meeting the course objectives.

With different types of digital communication applications online class instructors can use in their courses, online class instructors decide which digital communication applications assist in meeting their course objectives. In order to meet the course objectives in the online learning environment, the online class instructors used various types of digital communication applications: VoiceThread, instructor-made videos, online content videos, Skype, a Blog, avatars and a digital workbook.

Category 2 – Online Class Instructors’ Past Experiences.

In order to decide what type of digital communication applications to incorporate into their online courses, the online class instructors also looked at their past experiences using digital communication applications.

Sandy.

Sandy likes to explore different types of digital communication applications in her online courses. In order to explore different types of digital communication applications, Sandy attends various online course workshops on campus including a Wimba workshop during the spring semester of the study. Also, Sandy is a reviewer for the university’s new online courses and tries to attend each semester’s New Online Course Showcase to see and learn more about how other online class instructors are using digital communication applications in their online courses.

When asked about past experiences with different types of digital communication applications she discussed the previous digital communication applications she has used and why she selects different ones. In her interview, Sandy stated:

(In the past I used) TokBox, but now I am using the Wimba. I used Skype sometimes, but I really would like to have a Windows product that is called Pronto. Pronto is just like Skype, except our university supports it. They don’t support Skype (since it is a third party vendor it is not linked into the course and IT can’t diagnose students’ problems with the site). So, if something messes up in your Skype, they can’t help you. (Interview, March 2011)

Instead of just selecting digital communication applications to meet her course’s

objectives, based on past experience, Sandy also looked at digital communication applications that are supported in the university's CMS system, so students will have technical support if they need it, and on her experience using digital communication applications when attending various online workshops and reviewing new online courses for the university.

Trish.

Since this was Trish's first online course to teach, she decided not to use lots of different types of digital communication applications. In the interview Trish stated:

I know different professors who use lots of digital communication applications to create interaction. I'm just trying not to overwhelm them (students) and because it's the first time I've taught it. I just want to see how it goes. I thought, you know, I'll just build a basic class and see how it goes and then I'm going to ask for feedback from them to find out what they like or maybe they would have preferred to have something else. Just like you do in regular classrooms. You try it, you know, if it didn't work you will do something different next time. I didn't want to overwhelm myself either. I didn't want to have so much in there that it overwhelmed the topic. I want them to get the topic. I want them to understand it and if they're too concerned with technology or if this didn't work or that didn't work, that's going to be a problem. (Interview, June 2011)

When asked what types of digital communication applications she was going to use she stated:

I'm using YouTube (online content videos) and I'm using a Blog, which I've

actually used a Blog in one of my regular courses before and I really enjoyed it and I think they (students) get a lot out of it. She also noted the online content videos she already used most of them in (her other) class. (Interview, June 2011)

Though Trish decided to limit the number of digital communication applications due to lack of experience teaching in the online learning environment and based on her previous experience with the use some digital communication applications in her traditional courses, Trish did decide to use both a Blog and online content videos. In her interview, Trish discussed that for her fall course she might add or delete some of the digital communication applications she is currently using in the course depending on her experience in teaching her first online course.

Beth.

When designing her course, one reason Beth selected Skype was because of her past experience of using the digital communication application to talk with her family and friends in different cities and countries. Although the university's IT department can't technically support Skype because it uses a third party platform she thought online students would benefit from it in the course. And because online students might be in different locations or traveling, for fun or on the job, they still have access to Skype the same way they have access to the course.

Since Beth began to teach her course there have been other types of digital communication applications introduced that could reach the same course objectives and are supported by the university's IT department, she has continued to use Skype because of her own past experiences using Skype in her courses. When asked why she continues

to select Skype over other types of digital communication applications she stated that:

(In the beginning) Skype was more available to me, so I was familiar with it already. But, that was three years ago and Wimba was not really on the scene...(but) I really like the idea that Skype is also available outside the classroom learning environment because of the technology that they could bring with them into other context. (Interview, March 2011)

Due to her experiences with using Skype in the online learning environment she plans to continue to use Skype in her online course and is not looking at other types of digital communication applications.

Ali.

Based on her past experiences working with different types of digital communication applications, Ali has been able to determine what was effective and not effective in her online course. Ali noted that online class instructors, *can add lots of extra types of technology to a class that can take up lots of time (Interview, March 2011)* but to be effective one should only add technology if it adds quality to the course and is easy for students to be able to use. In her online course now Ali only uses avatars and based on her past experience noted that when using avatars you have to determine:

The level of how much you want to control it. You will have students who are 18 and if I say you can create any avatar you want, sometimes you get things that are inappropriate. This is an academic study and you want to say, "What's inappropriate to me is maybe not inappropriate to them. (Interview, March 2011)

She told the story of a student who in another online class put a broken heart on the face

of his avatar. This type of avatar might be appropriate in Second Life or an Online Dating site but she believes it is inappropriate for academic settings and is probably not something someone would do in a traditional course. In courses where students create avatars, Ali now has a disclaimer that students need to select something that is appropriate for the academic setting. By setting guidelines for using avatars or by creating assignments where students make historical figures, she can indirectly control the process and, if needed, direct the students to the disclaimer.

In regards to teaching, Powell and Kalina (2009) stated that, “the more prepared and comfortable teachers are in using effective tools such as conversation, discussion, and inquiry; the more they will use them and students can be adept at thinking and communicating” (p. 247). In the online learning environment, the more previous experiences an online class instructor has with using a digital communication application the more comfortable they are with incorporating it into their course.

Category 3 – Students’ Past Learning Experiences with the Application.

When determining what types of digital communication applications to incorporate into their courses, the online class instructors also focused on the students’ learning experiences and asked for their feedback on the various types of digital communication applications. By focusing on the students’ experiences, it allowed the online class instructors to incorporate digital communication applications students have had prior experiences using in the online learning environment.

Sandy.

When selecting digital communication applications Sandy selected ones that are not overwhelming to students. Sandy said:

I know some people on campus think all our students are computer savvy, but they're not. I mean, they know how to do G-Mail and Hotmail and happy Facebook, and maybe games, but there's a little bit of a learning curve to everything academic. (Interview, March 2011)

In selecting the types of digital communication applications for her course, Sandy tried to select a variety of applications. For example if students have an urgent question they may use GoogleTalk, email, or once a week she is also available via Wimba for an office hour where students are able to physically see and hear her.

When incorporating the digital communication applications, Sandy determines the students' experiences with the application and tries to provide information in order to assist students in using it. For applications such as VoiceThread, although she believes it is "pretty easy," on the CMS site she posted a link to the VoiceThread tutorial so students are able to find answers to the questions about the application.

Sandy also listens to the feedback of students. Sandy stated that students don't like to do online course evaluations but instead of doing evaluations she said:

They do stop by here or they e-mail me and if I get an opportunity I say, "How's the class going?" They say "Oh it's going fine. I really like it." So you get an idea you don't get as much feedback or maybe as much body language as face-to-face classes but you hear things like about, "Oh Yeah, I enjoyed the class. I

thought it was great,” or they make a recommendation. So there’s no grade attached to that conversation,...(and) they’re pretty forthcoming. (Interview, March 2011)

These types of conversations Sandy discussed do play a factor when deciding what types of digital communication applications to use in the course.

Trish.

Before beginning to design her first online course, Trish spoke with students about what they believed was effective and not effective in the online learning environment. When talking with the students they told her, *We like it to be easy to decipher. We like it to be real organized, not overwhelming.* Trish asked students what types of digital communication applications they liked, and students told her that in regard to instructor-made welcome videos and avatars that *we don’t really care if you use them.* So, she deleted the instructor-made welcome video from her course and did a welcome letter and a Blog post with a photo of her.

In order not to overwhelm students for her course, Trish decided to use more of the traditional tools of e-mail and announcements instead of lots of digital communication applications but based on her past experiences with students using a Blog, in one of her traditional courses, she did decide to use a Blog in her online course. She stated *I just find the Blog a really great tool, easy, they all know how to use it (Interview, June 2011).* In the future Trish discussed the possibility of using Facebook because students are accustomed to it. But, for now, she plans to continue and use the

Blog and online content videos. By incorporating students' feedback in the design of the course she tried to design a course that is not overwhelming to the students.

Beth.

Based on the content of her course, Beth tried to make the course more personal by using Skype but understands based on student feedback that at first there are some technical barriers students must overcome. Beth stated that:

I think because of the technical issues it just takes longer for them to kind of get into it. Uh, and the students, whatever the conventional wisdom is, the online classes aren't that hard to take...Without frightening them, I try to give them the material up front to say, "This is a very demanding class." (Interview, March 2011)

She does take into consideration the technical barriers of using Skype and in the syllabus gives her students, upfront, all of the information they need to know about the required resources needed for the course including a webcam, and a headset with a microphone. In order to help students with technical problems and not to *frighten them*, Beth also tries to build personal relationships with students through her informal Skype conversations with students. By setting up informal conversations with the students, she is able to help them individually with any problems that might arise during the semester in order to assist with the students' experience. Based on students' experiences in her prior online courses using Skype for their assignment and with informal conversations with her and other students in the course she plans to continue to use Skype.

Ali.

In the past, Ali has used various types of digital communication applications but students' comments such as, "I can't make it work" and, "Do we have to use this?" have made her evaluate the different types of applications she incorporates into her class. Similar to what Sandy expressed Ali said when designing online courses:

Everyone has the misconception...that students know how to do everything on the computer. They know how to do Facebook and how to search the Internet, but some don't even know how to do the basics. I've had students who don't know how to print the screen, that's basic. (Interview, March 2011)

When designing her course, Ali did not want students to be frustrated so in courses where students use digital communication applications, she gives students the option of using the designated applications or using another way to do the assignment. Ali said she wants the students' focus to be on the content not on the technology.

Although she has used other types of digital communication applications including Skype, she noted that she now only uses digital communication applications where students don't have to go to a different site unless she can embed the link into her course so they will not have technical difficulty. By looking at students' past experiences with the use of digital communication applications in the online learning environment Ali has been able to decide what types of digital communication applications to incorporate into her course.

From interviewing the online class instructors, observing the use of the digital communication applications and reviewing artifacts, the common deciding factors of

which digital communication application(s) to incorporate into their online course(s) were: course objectives, online class instructors' past experiences with the use of the application, and students' past learning experience with the application.

Sub Question 2: What are students' perceptions of digital communication applications in the online course(s) they have taken?

Based on the data collected from interviewing the online students, observing the online courses and reviewing the artifacts the common categories for students' perceptions of the use of digital communication applications in the online learning environment were: students preferred using traditional forms of communication over digital communication applications; students are more inclined to use digital communication applications if a grade is assigned as part of the participation; students believe the use of online content videos and instructor-made videos are effective in the learning process. In this study the perceptions of novice and veteran students were similar with few to no differences.

Category 1 – Students preferred using traditional forms of communication.

Each of the online courses in the study used various types of communication including traditional communication applications such as CMS tools, email, and face-to-face meetings, and digital communication applications such as avatars, GoogleTalk, online content videos, instructor-made videos, Wimba, VoiceThread, Skype, a Blog and digital workbook. But, when students were able to choose either a traditional form of communication such as email and chat, or a digital communication application such as Wimba or GoogleTalk students used the traditional form of communication. As seen in Table 2, students preferred the use of traditional forms of communication to the use of

digital communication applications.

Table 3

Use of Traditional Applications vs. Digital Applications

Course Application Student Usage	Legal	Language Verbal	Language Written	Business Communication Methods ^a	Total
CMS Announcements	836	338	368	451	1993
CMS Chat	108	143	0	48	299
CMS Mail	897	1399	635	345	3276
Class Q & A	460	703	310	72	1545
Blog ^b	n/a	n/a	n/a	341	341
VoiceThread ^c	8	n/a	n/a	n/a	8
Wimba ^d	20	n/a	n/a	n/a	20
GoogleTalk ^e	7	n/a	n/a	n/a	7
Avatar	46 ^f	n/a	27 ^g	n/a	73
Total Usage	2474	2736	1423	1743	8376
My Grades ^h	725	197	635	538	1898
Students enrolled ⁱ	20	15	18	21	75
Most active hour of the day	9pm–10pm	8am–9am	8pm–9pm	9pm–10pm	

Note. ^aBusiness Communication Methods was a four-week summer course. ^bThe online class instructor posted five times on the Blog. Only on the first posting did any student make comments. ^cVoiceThread was used for one assignment. Student received bonus points for making comments. ^dWimba was used for one hour during weekly office hours. ^eGoogleTalk was incorporated into the course mid-semester. ^fIn the course the avatar was used at the beginning of the semester to welcome the students. ^gIn the course the avatar was used four times throughout the semester. ^hThe ‘my grades tool’ is where students are able to monitor their grades. ⁱNumber of students enrolled at the end of the semester.

Based on the CMS tracking tool that was used in each of the online courses in the study, there were only 449 instances of student usage of digital communication applications with 341 of the usages being the Blog that was used for a four week summer course, compared to almost 8000 students’ usage of using CMS’s traditional tools such as mail, chat and announcements. The digital communication applications that were tracked were ones that were linked to the courses CMS site such as Wimba, VoiceThread, avatar

and a Blog. Digital communication applications that were not linked and made students go to outside sites, such as Skype, or applications that were embedded into the course such as instructor-made videos and online content videos were unable to be tracked through the CMS tracking tool.

Each of the online students interviewed, whether novice (N) or veteran (V), also discussed their preferences for traditional forms of communication over the use of digital communication applications but did see the benefits of having various modes to communicate.

Angie (N).

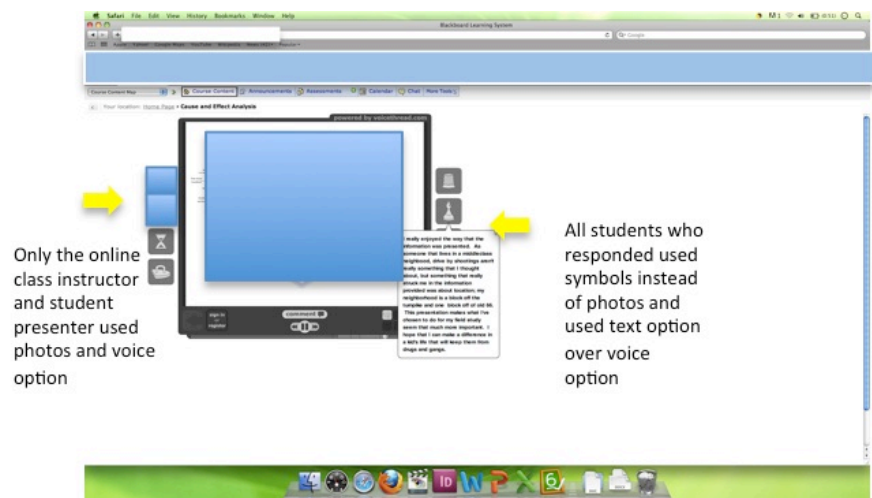
Angie was a student in the Law course, where the online class instructor used Wimba for her office hours. Angie discussed that although she knew the weekly time for the Wimba office hour she was never on the computer at that time. Angie did note that if she ever had a pressing issue she might have used Wimba but since the online class instructor was good at returning emails, she used email instead of Wimba.

The online course Angie was in also used VoiceThread. The purpose of VoiceThread is for students to be able to present and discuss with other students via audio or text. When using VoiceThread students are able to either post a photo or select a symbol, such as a thimble or hat, to represent them. Then when students post either an audio or text comment, their photo or symbol appears around the outside of the presentation slide. Students can then click on others' photo or symbol to hear or read what the student posted. In the course only approximately one third of the students

enrolled in the course responded back to the VoiceThread presentation. Of the six students who responded back to the presenter, all of the students used a symbol instead of a photo and all of the students used the text option instead of using the audio option (See Figure 6).

Figure 6

VoiceThread Used in Law Course



When asking Angie why she selected the text option over the audio option she said, *“It always feels weird to talk like that plus I didn’t know what my voice would sound like coming across that so I was like...I will just type that”*(Interview, May 2011). So, instead of using a photo and the audio portion, Angie used the symbol and preferred the traditional text option over the audio option.

Leah (V).

When given the option between traditional forms of communication and digital

communication applications, Leah used the traditional forms of communicating to interact with others including the online class instructor in the online learning environment. When discussing why she used traditional forms of communication she said:

I found that email is the best. I know some of them (online class instructors) are online from time to time, but I cannot imagine a teacher having to sit in front of the computer just in case someone wants to chat some time during those three hours. (Interview, June 2011)

Instead of waiting for the online class instructor's online office hours, Leah would email her questions. Leah also noted she probably would not use some of the different types of digital communication applications in order to contact the online class instructors. She said:

I would not use GoogleTalk or Skype because I think that I would be too afraid to call them. You know it is more personal because they are at home or you're either at home, or somewhere and it is almost too abrasive. If it was possible to have a time frame then I might. It depends on how big my problem was. (Interview, June 2011)

So, although she can't imagine an online class instructor doing online office hours and sitting in front of their computer, if an online class instructor was to use different types of digital communication applications she believes there should be a set time but would prefer to use the traditional forms of communication.

Mark (N).

Mark liked the Business Communication Methods course because there were various ways, including traditional and digital communication applications, to reach the online class instructor if needed but only used the traditional form of email when contacting the online class instructor. Mark stated, *secondary ways of being able to communicate with the online class instructor are always beneficial (Interview, June 2011)*. In discussing instructor to student interaction, Mark talked about how frustrated he was about one of his previous online courses where the online class instructor merely used email as a way to be contacted and only responded back to the email about every two weeks. He noted that because he could not contact the online class instructor in the class he often had to get outside help on the assignments by visiting the tutoring center on campus. So he believed online class instructors should use various forms of communication in order to be reached.

Jen (V).

Although Jen believes Skype was beneficial for the final oral exam, Jen often used traditional forms of communication such as email, calling or meeting instead of using Skype which was the required mode of communication for the assignments. For each of the six Skype assignments, each student was assigned to a different partner. The students were then given an assignment that they had to work together with their partner on in order for it to be completed. For example, one student is given information about time and days of a meeting, while the other student is given the location and the content. The students must then work together on the assignment to determine all of the information about the meeting.

Of the six Skype assignments, Jen said she only used Skype on *probably two of them* (Interview, May 2011). The other assignments she and her partners used traditional forms of communication such as calling each other on the phone, emailing each other and meeting each other at Starbucks. Some of the reasons she gave for using the traditional forms of communication were, being frustrated that other students did not know how to use Skype, people not being at their computers, students forgetting about the set time and having to call them, or it was easier to just meet or to have one person email one part of the assignment and another person email the other part of the assignment. So, although the students were still meeting the course objectives and had student-to-student interactions, Jen and her partners were using traditional forms of communication instead of the digital communication application designated for the assignment.

Jen also did not use Skype to have every other week informal conversations with the online class instructor. She said she only used Skype to talk with the online class instructor during the final oral exam and the remainder of the semester used the CMS email system. When asked about having the informal meetings with the online class instructor every other week she seemed puzzled and said although she had the online class instructor's Skype user name, she did not use it to contact her during the semester. Jen did believe that Skype was helpful because of the audio and visual options, especially when she used it during her final oral exam because if she was having trouble with the pronunciation of a word she could see and hear the online class instructor say the word.

Chris (N).

Chris did not have any online courses that required the use of digital communication applications, except for the Language Speaking course he dropped in April. In the course Chris did not do any of the Skype assignments and did not participate in the every other a week informal conversations with the online class instructor. In Chris's previous online course, the instructor used instant messaging as an option for students to be able to contact him. So, when the online class instructor might not be logged into the course's CMS site, if the online class instructor was on his computer students could still send him an instant message. Even though the instant message option was available, Chris thought it could have "*came in handy [sic]*" if needed but still used email, the traditional forms of communication to contact the online class instructor.

Although students liked that there were various types of communication applications available in their online courses, students used traditional forms of communication over the use of the digital communication applications when presented with both options.

Category 2 - Students are more inclined to use a digital communication application if a grade is assigned as part of the participation.

Similar to Boettcher and Conrad's (2008) notion that "you can assure that students don't participate in discussion by not allocating any assessment points to discussion" (p. 94), in this study, I observed where students did not use a designated digital communication application when it was not part of an assignment. In the different opportunities where students did receive bonus points for participating there was some

participation with the use of the digital communication applications.

For the course that used VoiceThread for presentations, students were asked to watch the presentations from the graduate students and were told they would receive bonus points for making comments. And, although the presentations were presented at the end of the semester when most students are worried about their grades, only six of the students in the course made comments. The other two thirds of the students enrolled in the course did not make comments including two of the participants in the study, Misty and Adam. Throughout the study, I observed Misty being very active with her group discussions, often leading and helping to organize the team assignments and being the first one to reply back to others' questions, but she did not participate in making comments on the VoiceThread presentation. Adam, who was not as active in his group discussions and who sometimes waited until the last day to respond to his group, also did not participate in making comments on the VoiceThread presentation. Angie, though, was one of the six students who participated for the bonus points and made a comment on the VoiceThread presentation. Angie believed that the use of VoiceThread was a good way for the material to be presented and liked interacting with the presenter through making a comment. When asked about her experience using VoiceThread Angie noted:

It was really interesting. I was not really sure when it showed up and when she (online class instructor) posted it, what I thought about it then when I watched the presentation and made comments which was really easy to do. It was really interesting. (Interview, May 2011)

For one of the courses that used avatars as a way to create interaction, few

students clicked on the link to view the avatar. The class enrolled eighteen students and although I couldn't track if each student watched the avatar, I could track how many times someone clicked on each of the avatar links. For the class there were a total of four avatars posted and they were all watched a total of twenty-seven times. In the class there were 18 students enrolled. The first week there were 15 times students watched the introduction welcome avatar. The next three times the online class instructor posted an avatar there were only 12 times students watched the avatar, with one of the avatars only being watched twice. So though the avatars gave information to the students about the course content all of the students did not watch each of the avatars' messages.

For the course that used the Blog, the online class instructor wrote five blogs and allowed students to leave comments. For the first blog, in order for students to become familiar with the process, she provided bonus points for students who posted a comment and wrote a personal introduction about them. Of the twenty-four students originally enrolled in the course, nineteen students posted a comment on the introduction blog. Both of the participants in the study, Leah and Mark, did use the blog and posted a personal introduction about themselves. But, although Leah wrote and posted the information about herself, and looked at all the other students' posts she still did not know one of her friends was in the course until the end of the semester and could not recall if that person had written a personal introduction on the Blog. The other four blogs included information about the course content, course assignments, and links to student-made videos. But, even though the students had viewed the Blog 341 times during the four weeks of the course, students did not make any comments on the other four blogs. So although students were reading the Blog, they only made comments when they

received bonus points for participating.

Students did use the digital communication applications such as online content videos when a grade was attached. During the study, I observed the online class instructor posting online content videos, and for a grade, having student respond back via discussion board comments about the video. In each of these instances nearly all the students made comments to the discussion board or turned in assignments about the video. So although online class instructors incorporated various types of digital communication applications into their online courses, students were not inclined to use them unless a grade was assigned to the participation.

Category 3 - Students believed the use of videos in the online learning environment were effective.

Overall, students believed the use of instructor-made videos and online content videos were effective in the online learning environment. Through talking with the students and observing their behavior I noticed that students were actually watching and responding on the discussion boards about the content of the videos in their online courses. In the interviews, the students would use the term “video” in general. In this study the students were referring to two different types of videos that online class instructors used in their course: 1) online content videos which are pre-produced videos, such as YouTube videos, that relate to the content, and, 2) instructor-made videos which are videos the instructor produces using a computer webcam or camera to discuss the course content. Although the students used the term video for both, they did talk about the benefits of having both of these instructor-made videos and online content videos in their online courses. The main reasons students thought videos were effective was

because they provided additional content information about the course, some of the students are visual learners, and they liked the interaction with the instructor because they were able to get a sense of the online class instructor's personality. Here are some of their other comments:

Angie (N).

In the online learning environment, Angie thinks the online content videos were effective because, *with videos, it was just another dimension, to learn (Interview, May 2011)*. So, besides just reading and using the discussion board, Angie was able to gain additional knowledge through the use of videos. Another part Angie liked about videos was there were no technical problems with using them since most of the videos in her course were embedded into the course's CMS. This made watching the videos easier for the students since they did not have to go to another site to gain access to the videos.

Leah (V).

In asking Leah about her perception of videos in the online learning environment she said they were, "*Great! Great,*" she especially liked *the introduction (instructor-made videos) that some of my professors did. They both had the intro and you kind of got to meet them kind of face-to-face (Interview, June 2011)*. Leah believed she was able to learn more about the professor and their personality from the instructor-made videos. Although Leah liked the instructor-made videos, the course she was enrolled in, Business Communication Methods, the instructor decided not to use an introduction video but did use a Blog for students to introduce each other and also did a welcome letter with a photo of herself.

Leah also liked the online content videos where she had to click on a link to retrieve the video. In relation to videos and content Leah said, *If they have a link to the Internet it is almost like our generation (net generation) goes 'oh yes' a link, let me go learn more on the Internet (Interview, June 2011)*. So, by adding additional resources to the course similar to Angie's it added another dimension to the learning.

Mark (N).

In Mark's online class, the online class instructor used online content videos. Mark expressed his like for online content videos because he could go back over the material as needed and believed it was easier to watch the videos than it was to sit in a classroom and listen to a lecture. Although in his online course, the online class instructors did not use instructor-made videos, one of his traditional class instructors used them when there was inclement weather. He thought the instructor-made videos would be effective in the online learning environment and said, *I liked it a lot because I am a visual person (Interview, June 2011)*. Because Mark is a visual learner he said online videos helped him remember the information over reading the material.

Jen (V).

Jen liked the online content videos used in the Language Speaking course. Jen thought the course could benefit from the use of more videos. In order to learn the language, she thought it would be effective to use online content videos with subtitles in order for students to see and hear the words in the content of different conversations. Jen also believed instructor-made videos would have assisted in her learning. Jen thought if the course had instructor-made videos instead of just audio files of how words are pronounced then she could see and hear how the online class instructor pronounced the

words for the final oral exam review. But based on the content of the course she and the online class instructor agreed the instructor-made videos should not be lecture-style because is not a lecture-style course but rather more a practical application course.

Chris (N).

Although the online course Chris was enrolled in used instructor-made orientation videos and content online videos through the course's digital workbook, he did not enroll in the class until after the orientation module was complete and throughout the semester did not log into the digital workbook, so he was unaware of the online content videos.

With the different types of videos that can be used in the online learning environment, students believe both online content videos and instructor-made videos are effective and enhanced the online learning experience.

Category 4 – There were no differences in perceptions of novice students compared to veteran students.

Based on the data, even though a veteran student might have taken more online courses it seems that being either a veteran student or a novice student did not affect their overall perception or participation of digital communication applications in the online learning environment. For this study from each of the online courses, five novice students and four veteran students were observed, and three novice and two veteran students consented to be interviewed. When observing both novice and veteran students, it was hard to differentiate between them. In some of the courses, the novice students participated more while in other courses the veteran students participated more. For example, with VoiceThread one of the novice students made comments but the veteran

students did not participate. One of the reasons for this might be because many of the previous courses taken by both the novice and veteran students did not use any type of digital communication applications. So, although veteran students might be considered more experienced in the online learning environment they might not necessarily be the most experienced in relation to using digital communication applications.

In relation to overall participation in one course, Jen a veteran student, was very active in the Language Speaking course, while Adam, a veteran student, was not active in the Law course. For the novice student, Mark was active in the use of the digital communication applications in the online course, although he was not active in my traditional course, while Chris was not active in the Language Speaking course and dropped out of it in April because he forgot he had enrolled in it. However, when I had Chris in one of my traditional courses, he was active. So, although students might be not be active in the online learning environment, they might not be active in the traditional setting either.

Based on the data collected, the common categories for students' perceptions of the use of digital communication applications in the online learning environment were: students preferred using traditional forms of communication over digital communication applications; students are more inclined to use digital communication applications if a grade is assigned as part of the participation; students believe the use of online content videos and instructor-made videos are effective in the learning process, and there is no differences in students' perceptions between novice students and veteran students.

Overview

Although the online class instructors were selected based on their use of digital communication applications in order to try and create learner-centered online learning environments based on the data, most of the digital communication applications in this study did not create learner-centered online learning environments. The data from the study indicated that although online class instructors' intentions in using the various digital communication applications were to have learner-centered environments, these applications did not assist students in being active participants in the learning process. Instead of being active participants, most students were passive recipients and either used a traditional form of communication instead of a digital communication application (Skype) or did not participate at all (Wimba, Blog, VoiceThread, watching avatars).

The lack of active participation with the use of digital communication applications is demonstrated with students selecting the use of traditional communication over the use of the digital communication applications. For example in the online course that used Skype, for students to interact with one another, one student only used Skype for two of the six assignments. Instead of using Skype to contact her partner, she and her partner would use email to send their information or she would meet with her assigned partner for that particular assignment to determine what each person needed to do to complete the assignment or call each other. This student also created a different Skype name for the class so other students would not know when she was on Skype talking to her other friends. Some of the other students in the course also did not complete all the Skype assignments and some did not participate at all. So even though the use of the

digital communication application could allow students to be active participants in the learning process, some students chose to use traditional modes of communication.

The lack of active participation can also be seen with the use of other types of digital communication applications including Wimba, VoiceThread, avatars, and Blog. With the use of Wimba, most of the students clicked on the link once and then used email or chat to contact the online class instructor. With the use of VoiceThread, only one third of the students used VoiceThread to watch and made comments on the presentation even though they received bonus points for participating. With the use of the avatar, in one of the online classes only two students watched one of the avatars the online class instructor had posted. And even though the Blog had over 341 views, only 19 of the 24 students did an introduction post for bonus points and no students made comments on any of the other four blog posts for the semester. And with the Blog some students were not going back and reading other students' introduction posts. In the course that used the Blog, two students who were friends and did introduction posts did not realize until the end of the semester that they were in the class together. So although the online class instructor incorporated the digital communication applications in order for students to be active participants not all students used the digital communication applications were active participants.

At the beginning of the study, I was observing the use of Wimba, Skype, VoiceThread, the Blog and avatars, but throughout the study I began to notice that the digital communication applications where students were being active participants in the learning process were through the online content videos. In observing online students' discussions and assignments where online content videos were used, students related the

content of the video to the course. After viewing one of the online content videos a student posted the comment to a discussion question:

I do believe it is possible to be a “moral atheist.” Although, I believe there is a standard of morals that apply to everyone as a whole and those that people choose to apply to their own lives, such as religion. As stated in the video, we all agree that we want to live in a morally correct world where no one steals, rapes, or lies. Those are a handful of the universal principles that are applied to everyone. Those who chose religion, choose to live by a different set of morals than what the world accepts as morally correct.

The comment demonstrates the student was able to relate the course content to the online content video and the student is being an active participant in the learning process through expressing her opinion about the subject. Students also made comments to her posting about their thoughts on her view allowing her to actively interact with students about the content.

Another online class instructor had students write reaction papers about the online content videos. One of the online content videos discussed how the advancement of technology has played a role in regard to Law. Here is an excerpt from one of the papers:

Technology has always been interesting to me, so when it is coupled with my other interest, law enforcement, it makes it that much more interesting. However, what they were describing in the video is just an entry point of what can be done with technology. Robots with more dexterous hands can be used in more delicate situation and used to deactivate explosive devises instead of only removing them.

Taking the cameras and sensors on the helicopter one step further and use high definition equipment for a higher resolution view of the actual scenes. As technological breakthroughs are made the use of technology by law enforcement will increase making response times faster and keeping our boys in blue safer.

This demonstrated how the student was able to take the content of the video and give his views and critiques of the use of technology in Law. For another video about the history of Law in relation to police officers, a student wrote:

It's always good to know history on what you want to do for a living, but like most things in today's society it took a while for policing to embrace the fact that women can do the job. I grew up around law enforcement, my father was a reserve deputy and my uncle was on a police force. These days even my two best friends from high school are in law enforcement. I found the video very interesting in the fact that it imparted information that I was not aware of. I am a firm believer in community oriented policing, my neighborhood had a few issues with cars being broken into, but once we started the patrols in the evening we didn't have that issue anymore. A strong community relationship with their police force is advantageous for everyone.

The student's comment demonstrated how she was able to relate personally to the video but another student after watching the same history video shared his concerns with the video.

As a general community information video, I thought the video did a very good job of educating the public about the department in a positive light. This video

probably influenced people to learn more about the department and become involved in community policing projects. As a recruiting video, it should have shown that policing is difficult and time-consuming. It would be better to get applicants that know the cons to policing as well the pros, so that they are more likely to be successful in policing.

The comparison of two the students reflection of the online content video demonstrates that each student is constructing their own knowledge in regard to the content of the video.

Throughout the study, the use of online content videos allowed students the opportunity to not just read the material out of a textbook or view a powerpoint online but allowed students to be active participants by watching the video and relating how the video is relevant to them and through sharing their opinion.

During the interviews with the online students there were several comments about the use of videos including:

“I liked it a lot because I am a visual person.”

“If they have a link on the Internet it is almost like our generation (net generation) goes ‘oh yes’ a link, let me go learn more on the Internet”

“With videos, it was just another dimension, it helped to learn”

“(videos in online courses) are Great, Great”

“you can watch them at your own pace”

One student even shared that she wished there were more videos in the online class.

“additional ways would have helped (to learn the subject) ...like videos with subtitlesor watching the teacher talk in the language and seeing her mouth and how to pronounce the word...and I could practice saying the word with her”

As noted through the students’ comments by using online content videos to enhance the learning experience, it allows online students to be more active in their learning process with the content of the course.

Due to the transmission of information and the difference in the atmosphere the online learning environment provides, online class instructors need to look at effective ways to create learner centered learning environments. Although the function of digital communication applications in the online learning environment is to create interaction, students are not using most forms of digital communications to be active participants. The use of online content videos does allow students to become active participants in the learning process through students watching the videos and writing their views and opinions as it relates to the content of the course. So when incorporating digital communication applications in the online learning environment, online class instructors need to remember just because you are using the latest technology does not mean actively students are learning from it.

Summary

Using Vygotsky’s constructivist theory (1978) which is based on the notion that social interaction plays a fundamental role in the learning process, I observed nine students in the four online courses where the online class instructors used digital

communication applications including: Wimba, GoogleTalk, VoiceThread, online content videos, instructor-made videos, avatars, Skype and Blogs in order to try and create learner-centered online learning environments. Also, I interviewed the four online class instructors and five online students; and reviewed the online courses' artifacts. Through the data analysis process of emergent category designation (Erlandson et al., 1993), categories began to emerge in order to answer the study's research questions.

Question 1: What are the functions of digital communication applications in the online learning environment?

Each of the digital communication applications used in the four online courses in the study had a different function in the online learning environment. The common functions for digital communication applications were to create instructor-to-student interaction, student-to-content interaction, and student-to-student interaction.

Question 2: How do online class instructors decide which digital communication application(s) to incorporate into their online course(s)?

Since digital communication applications are used for different types of interaction in the online learning environment, online class instructors looked at different ways to incorporate digital communication applications in their online course. The common categories for determining which digital communication applications to incorporate into their online course were course objectives, online class instructor's past experiences with the use of the application, and students' past learning experience with the application.

Question 3: What are students' perceptions of digital communication applications in the online course(s) they have taken?

The students who participated in the study had various experiences with the different types of digital communication applications used in the online course(s) that they have taken. The common categories for students' perceptions of digital communication applications in online courses were students preferred using traditional forms of communication over digital communication applications when both options were available, students were more inclined to use a digital communication application if a grade was assigned as part of the participation, and students believed the use of online content videos and instructor-made videos were effective in the learning process and there was no difference in students' perception in relations to novice students and veteran students.

The initial categories concluded that although online class instructors incorporate different types of digital communication applications in order to create various types of interactions in the online learning environment, students' use of most types of digital communication applications did not assist students in being active participants in the learning process.

CHAPTER V

CONCLUSION

This study explored the use of digital communication applications in the online learning environment. The purpose of this study was for the researcher to obtain a better understanding of the online learning environment, to explore the various ways online class instructors have incorporated digital communication applications to try and provide learner-centered online environments, and to examine the students' perceptions of the use of digital communication applications in achieving learning outcomes.

The theoretical framework for the study was Vygotsky's (1978) constructivist theory which is based on the notion that social interaction plays a fundamental role in the learning process. Looking through the lens of constructing knowledge through social interaction, the function of the digital communication applications used in the study was to create various types of interactions including instructor to student, student to content and student-to-student. Even though the digital communication applications were incorporated into the online courses in order to try and create learner-centered online

learning environments where students were active participants instead of passive participants through the use of the digital communication applications, students often did not use the digital communication applications in order to actively interact in the online courses. As Kreijns et al., (2003) noted, sufficient interaction is not guaranteed just because technology is designed to create it. Instead of using digital communication applications in order to interact, students either did not use the applications or opted to use traditional forms of communication. Based on the findings from the study, because students were not using the digital communication applications to interact in the learning process, as the online class instructor incorporated the applications to be used in the courses, students were not active participants in the learning process through the use of the digital communication applications in the online courses.

Significance of the Study

Many studies in relation to digital communication applications in the online learning environment only looked at the use of one type of digital communication application in an online course. This study looked at the holistic dimensions of the use of various types of digital communication applications that were incorporated into different online courses. By exploring the use of digital communication applications in the societal and individual context, it allows stakeholders to construct new realities about the function of digital communication applications in the online learning environments. The findings from the study will contribute to the knowledge about the use of various types of digital communication applications in the online learning environment and will emphasize that just because online class instructors are using the latest technology in order to create interaction it does not mean students are actively learning from the use of the technology.

Discussion

With the advancement of technology there are many new types of digital communication applications that are available for online class instructors to incorporate into their online courses in order to create learner-centered online learning environments. By effectively using the various forms of technology, online class instructors can create learner-centered online learning environments (West & West, 2009). Research has shown that a learner-centered environment increases students' success in the learning process (Kember, 1997; Sarasin, 1999). To explore how digital communication applications are used to try and create learner-centered online learning environments, in order for students to be active participants in the learning process, the researcher purposely selected online class instructors who used digital communication applications with the intentions of creating learner-centered online learning environments and looked at the following questions:

Research Question

- What is the function of digital communication applications in the online learning environment?

Sub Research Questions

- How do online class instructors decide which digital communication application(s) to incorporate into their online course(s)?
- What are students' perceptions of digital communication applications in the online course(s) they have taken?

Based on the findings from online class instructors' and students' interviews, tracking the usage of both digital and traditional communication applications, observing

the applications used in the study and reviewing the artifacts, students did not actively use the digital communication applications in the online courses.

Research Question

The main research question was, *what is the function of digital communication applications in the online learning environment?* The function of digital communication applications in the online learning environment was to create interaction. Each of the online class instructors used the different types of digital communication applications in order to create various types of interaction including: instructor to student interaction, student to content interaction and student-to-student interaction.

Online scholars discuss that in order for students to be effective in an online learning environment, interaction is important (Conrad & Donaldson, 2004; Draves, 2000; Kearsley, 2000; Palloff & Pratt, 1999, 2001, 2005, 2007; Sims et al., 2002; West & West, 2009). Since digital communication applications function is to create interaction, it may be assumed that the use of the application in the online course would assist students in overcoming the lack of social interactions. The types of interactions that occur though may differ depending on how the online class instructor incorporates the digital communication applications into the online course. For examples in this study, in order to create instructor to student interaction, two online class instructors used an avatar to introduce students to the course. And both of the online class instructors also used the avatar during the semester in order to create student to content interaction by giving students information about the subject.

Muilenburg and Berge (2005) noted that students perceive the lack of social interaction as the “most severe barrier” in online learning. Even though students believe that the lack of interaction is the most severe barrier in online learning (Muilenburg & Berge, 2005), students opted either not use the digital communication applications or to use traditional communication applications. In determining why students used traditional forms of communication instead of using digital communication applications in the online learning environment, the data showed that students were either not comfortable or familiar with using the technology in the online learning environment. As Palloff and Pratt (2005) discussed, for students to succeed in the online learning environment, they must be comfortable with the technology. In the online class instructors’ interviews, two of the online class instructors discussed that although students might be comfortable with the technology, there is a learning curve in regard to using the technology in the online learning environment. As Conrad and Donaldson (2004) stated it takes about four weeks for students to be comfortable with the use of the technology in an online course. So just because students might be familiar with technology, if the course only uses the application a couple of times in the semester or it is a four week course instead of a 16 week semester course, students might not be comfortable using the application in the online learning environment.

The findings indicate that the function of digital communication applications in the online learning environment is to create interaction. But because students were not comfortable or familiar with the use of the technology in the online learning environment, students did not utilize the function of the digital communication applications and significant interactions did not occur.

Research Sub Questions

Findings from the two research sub questions gave insight into how online class instructors decide which digital communication applications to incorporate into their online courses and online students' perceptions of the use of the digital communication applications.

The first research sub question, *how do online class instructors decide which digital communication application(s) to incorporate into their online course(s)*, resulted in identification of various categories including the online class instructors' course objectives, their past experiences with the use of the applications and students' past experiences with the use of the applications. Much literature affirms that in deciding the right type of technology needed for an online course, online class instructors need to first look at the learning objectives for the course then select the most effective type of technology to meet those objectives (Conrad & Donaldson, 2004; Hirschbuhl, 2007; Kearsley, 1998; Palloff & Pratt, 2001, 2005, 2007; Sims et al., 2002; West & West, 2009). But in designing an online course, some online class instructors believe that online learning is about the technology rather than about creating a different structure for learning (Kearsley, 1998; Palloff & Pratt, 2007). So although the online class instructors in the study were looking at the course objectives in determining what type of digital communication applications to incorporate into their online course, instead of trying to create a different type of learning experience, many of the online class instructors only looked at the technology and did "curriculum conversion" which is converting their traditional classroom material to online material in order to meet the course objectives.

Online scholars have noted that due to continuously changing technology and the lack of research on the online learning environment, online class instructors simply try to convert curriculum and do not consider the difference in the transmission of information for their online courses (Akdemir & Koszalka, 2007; Palloff & Pratt, 2007). From interviewing the online class instructor, reviewing the artifacts and observing how the digital communication applications were incorporated into the course, I could see how the online class instructors were converting some of the traditional curriculum into their online courses through the use of the digital communication applications. In the interview each online class instructor made comments of trying to recreate an activity they do in their traditional course into their online course or selecting a digital communication application because it worked well in their traditional course. For example one of the online class instructors used VoiceThread for student presentations in order for students to have the same type of experience as students do in the traditional courses. Another online class instructor used Skype for students to be able to practice talking to one another in other languages and to do the same class activities that are done in the traditional classroom. And one of the online class instructors incorporated the Blog because of her past experience using it in a traditional course.

With the use of digital communication applications, online class instructors were able to convert the curriculum from their traditional courses to their online courses to meet the class objectives. But because online class instructors did not take into consideration the difference in the structure of learning, the course objectives were not always being met through the use of the digital communication applications.

In determining what types of digital communication applications to use in their online courses, the online class instructors also looked at their past experiences and students' past experiences of the use of the applications. Liaw et al., (2003) noted in order to understand which learning tools to incorporate into online courses that will enhance teaching and learning, research needs to be conducted to understand both the educators' and students' perceptions about the learning tools. In the interviews there were various times when the online class instructors discussed incorporating the application based on their experience using the application. By online class instructors looking at their past experience it allowed them to incorporate the digital communication applications that they were familiar and comfortable teaching with in the online learning environment. As Collins and Berge (1996) note, since online class instructors play a role in the success of the design, organization, and instruction of an online course, they must be proficient in the technology being used in order to establish credibility with students. By looking at their past experiences the online class instructors in the study were able to establish credibility as they tried to enhance the learning experience by providing learning tools they thought would benefit students in the learning process.

In this study, the online class instructors also looked at students' past experiences with the use of the digital communication applications. As Kenny (2003) noted, students' perceptions about their learning experiences in online classes has an impact on their overall satisfaction of the online learning environment. Although this study did not directly look at students overall experience with the course in relation to the use of the digital communication applications being used, there was some direct correlation on students' perceptions of the applications in relation to their overall satisfaction of the

course. In the study students who had a positive experience with the course spoke favorably about the use of the digital communication applications even though they might not have used them. And the veteran student, who at the beginning of the interview stated that the Language Speaking online course was her least favorite online course she had taken, was outspoken about her dislike for the use of the digital communication applications, but did provide recommendations on how her experience in the online course could have been better through the use of online videos.

In the online courses when determining the types of digital communication applications to incorporate into their courses, the online class instructors looked at the learning objectives, their past experiences and students' past experiences with the use of digital communication applications. Although the online class instructors looked at their past experiences and students' past experiences because they did not create a different structure for learning but instead did "curriculum conversion", the students did not effectively meet the course objectives by being active participants in the online course through the use of the digital communication applications.

The second research sub question, *what are students' perceptions of digital communication applications in the online course(s) they have taken*, resulted in the identification of various categories including student preferred traditional forms of communication, more students were inclined to use a digital communication application if a grade was assigned as part of the participation, students believe that the use of online content videos were effective and there was no difference in the perception of novice students compared to veteran students.

Students in this study preferred the use of traditional forms of communication over digital communication applications, Although students did use traditional forms of communication over digital forms of communication, when presented with both options, some students though did use digital communication applications if a grade was assigned. This is similar to the use of traditional forms of communication, where students are more inclined to participate when grades are assigned to discussion board assignments (Boettcher & Conrad, 2010). But though students were interacting through the function of the digital communication applications in order to receive a grade, there was not sufficient interaction when using the applications.

Although students in the study preferred the use of traditional forms of communication over digital communication applications, based on the findings of students' perceptions of digital communication applications, students were active participants through the use of online content videos which function is to create student to content interaction. In interviews, students discussed how the online content videos that were incorporated into the various online courses enhanced the online learning experience by adding a different dimension and did not require students just to read out of the textbook but allowed them to interact with the material online. By using the online content videos, students were able to construct knowledge through sufficient interaction with the content which was seen through reviewing various types of assessment including personal reflection papers and discussing posting about their opinions about of the online content videos.

In reviewing the findings, I was also surprised that there were no differences in the perceptions of novice students compared to veteran students. As Jung et al., (2001)

had noted “there is a dynamic relationship between time and established proficiency in computer media. A novice student may need more time to accomplish what an experienced user can do quickly” (p. 510). But in regard to the use of digital communication applications even though the veteran students had taken more online classes and may be perceived to be more proficient in the online learning environment there was not a difference in the usage or perception of the digital communication applications between a novice and a veteran student. And as a researcher without knowing in advance if a student was novice or a veteran it would have been unclear in observing and interviewing the students which ones were novice students and which ones were veteran students.

Although the functions of the digital communication applications in the online courses were to create various types of interactions, students regularly opted to use traditional forms of communication in order to interact in the online learning environment. The findings from interviews, artifacts and recommendations for more online content videos, demonstrate that students had significant interactions through the use of online content videos and want to be active participants in the online learning environment.

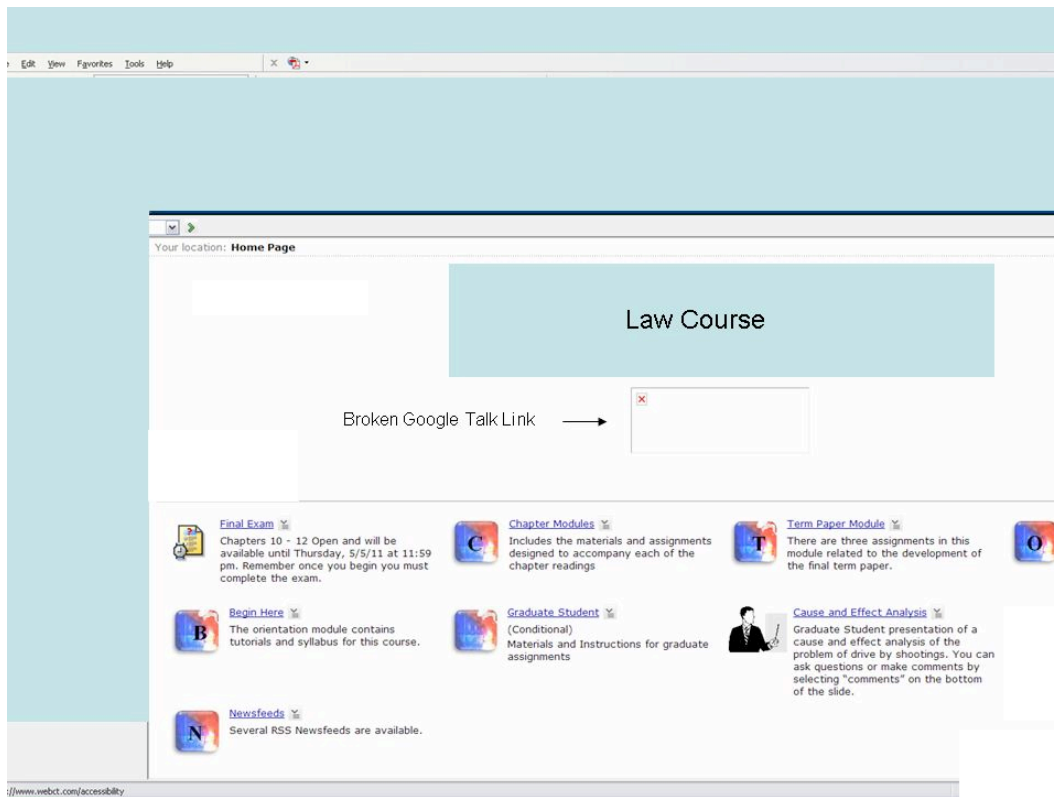
Missing Category

In reviewing the data, one category I believe was missing, was the technical problems students may have in the online learning environment. Howland and Moore (2002) noted that technical difficulties in online courses will occur until compatible technology is available for all students. Throughout the observation phase of data collection, I occasionally had various technical difficulties with being unable to view

different functions in the online courses. One day in observing the Law Course, I was unable to view some of the components on the online course's home page including the GoogleTalk link (Figure 7) and another day the VoiceThread presentations would not open.

Figure 7

Technical Difficulties in Law Course



The reason given by the Office of Online Learning for the technical difficulties was based on the notion that the computer software was not compatible with the web browser that I was using in observing the courses. For example for the university's CMS

it was recommended when using a Macintosh computer to use the Safari web browser. In order to assist with the technical difficulties, I was directed to the CMS main login page that stated:

Due to the issue with CE (Campus Edition software suite used to host online classes) and the recent releases of Java, we recommend that you don't upgrade to the current version when promoted. If you have already upgraded your computer, here is a link to download Java. These instructions will walk you through uninstalling the newer version.

But although technical difficulties did occur in the online courses, students did not seem concerned about the technical issues. In the interviews, students did not mention any technical problems. When asking about technical difficulties in the Law course, Angie stated she did not have any. But when I mentioned to Angie when observing the course that I was not able to see the GoogleTalk link or open up one of the VoiceThread presentations she said, *oh I guess that would be a technical difficulty, I thought she (the online class instructor) did not want us to view the presentation yet* (Interview, May 2011). But her response was more like a thought instead of direct statement which related to the notion that she did not seem concerned that there were any technical difficulties in the course. A reason students might not have been concerned by the technical issues was because if one occurred they could email the online class instructor with questions about the assignment or ask the questions on the class question and answer link. So although technical difficulties did occur, because the software was not compatible, students did not seem concerned about technical difficulties in the online courses.

Limitations of Online Learning and Teaching

Through the advancement of technology which can create various types of interaction, there are various opportunities including the use of digital communication applications, for students to be active participants in the online learning environment (West & West, 2009). But the types of social interaction in the online learning environment are different due to the atmosphere and the transmission of information in the online learning environment. Because of the differences in the atmosphere and the transmission of information there are some limitations in both teaching and learning the online learning environment.

One limitation is due to the difference in the atmosphere, students are often left alone interacting with the content, and might be the only one participating (Northup, 2001). Since students might be the only one learning they are not constructing knowledge through interaction. Although technology can help online class instructors to try and create interaction, students may still not be active participants in the learning process. A limitation in the use of technology is the transmission of information in the learning process. As Wellburn and Eib (2010) noted that although students are familiar with technology it does not necessarily mean that students know how to learn in the digital environment. For this study, all of the student participants were net generation students (born between January 1977 and December 1997) except for one. Literature written on net generation students says that they like interactive use of computer media. Waterhouse (2005) noted that net generation students have high expectations regarding the use of technology in education and are often more familiar with technology than many educators. These students have *Grown Up Digital* and their use of interactive forms of

communication such as the Internet has superseded their use of television, a one-way form of communication (Tapscott, 2008; Vollmer & Precourt, 2008). But with the difference in the atmosphere and the transmission of information there are limitations in the types of interaction that may occur through the teaching and learning in the online learning environment. Due to the limitations in the online learning environment students may not construct knowledge through the same types of social interaction as they do in the traditional learning environment.

Based on the findings from this study, due to the difference in the atmosphere and the transmission of information in the online learning environment, additional research needs to be conducted to look at effective ways to create learner-centered online learning environments and of students' perceptions and the trends of digital communication applications and how effective the applications are used in the overall online learning environment. In order to continue to gain a better understanding of the online learning environment, as digital communication applications become more relevant in society and as additional applications are created, research will need to be conducted to examine how to effectively incorporate these applications into the online learning environment.

Recommendations

My overall recommendations are based on the findings from the study. For online class instructors to meet the course objectives and allow students to be active participants in the online learning environments, online class instructors should: allow various opportunities for students to be active participants in the online learning environment, provide various opportunities for instructor to student interaction, continuously receive

student feedback, and, because one of the deciding factors in incorporating digital communication applications into the course was online class instructor's past experience with the use of the applications, universities should provide professional development on the use of various types of technology in the online learning environment.

First, online class instructors should provide as many opportunities as possible for students to be able to learn in the online learning environment. Since the objective of the online learning environment is to create a different type of learning environment, online class instructors should create various opportunities in order to provide students with additional resources including online content videos that allow them to be active in the online learning environment through discussion, reflection and by participating in simulation videos. From the findings, students believed there was a benefit to the online content videos because the videos create interaction and the opportunity to learn more about the course content. In addition some students are visual learners and others like to explore learning through various links on the Internet. In the online learning environment due to the transmission of material and lack of social interaction, students may then become passive participants and feel isolated (Bryceson, 2007). The use of digital communication applications such as online content videos provides additional resources for the students and allows for students to interact with the content and be active participants.

Second, online class instructors should incorporate various ways to create instructor to student interaction. In relation to digital communication applications creating instructor to student interaction, students in their interviews said that online class instructors should have various ways for students to be contacted them through face-to-

face and online interactions. But although three of the online class instructors provided various types of digital communication applications in order to create two-way instructor to student interaction including Wimba, GoogleTalk, Blog and Skype, the students interviewed did not use the digital communication applications in order to interact with the online class instructor. Instead of using the digital communication applications students used traditional forms communication, but students did like that there were multiple ways in the courses to interact with the online class instructors and might have used the digital communication application if needed.

Another way to create instructor to student interaction is through instructor-made videos and traditional communication applications. In the study all of the online class instructors discussed the importance of creating interactions the first week. All of the online class instructors in the study either created an instructor-made video, avatar or posted a blog with a photo. It is recommended by online scholars that online class instructors immediately build a rapport with their students on the first day of class (Conrad & Donaldson, 2004; Ko & Rossen, 2008). The use of an instructor-made video can began to build rapport with students. Students believed this type of interaction is effective with one student stating, *I love especially the introduction like Dr. N and Dr. V both did it. They both had the intro (video) and you kind of got to meet them kind of face-to-face (Interview, June 2011)*. And, throughout the semester, it is important to use other types of interaction that does not need to include the use of a digital communication application. For example, in most CMS sites there is a chat or discussion board function. Online class instructors can set-up a time each week, for thirty minutes, where they can be online to discuss or chat information. Also, online class instructors should set-up

guidelines on the instructor's response time to email. If an online class instructor tells students they will respond back within 24 hours students can know when to expect an email and not wait for two weeks wondering if they will receive a response. As noted online class instructors play an important role in students' satisfaction of an online course (Bolliger & Martindale, 2004). By creating interaction the first week and throughout the semester it allows students to be able to focus more on learning and will assist in contributing to their satisfaction of the online course.

Third, online class instructors should continually receive feedback from students about their perceptions of the online learning environment. This feedback will allow students to become active participants in the learning process. In the traditional classroom instructors are able to receive students' feedback by both verbal and non-verbal cues, but in the online learning environment, due to the difference in the atmosphere and the transmission of information, this is hard. Due to lack of interaction and physical presence of students' reactions in the online learning environment there is a greater need for online class instructors to look at students' perceptions. Max van Manen (1984) comments that in education we should look at the learning experience from the students' viewpoint in order to gain a better understanding of how they experience learning. Although most of the online class instructors in the study noted that students do not like to fill out online course evaluations, the online class instructors in the study still asked for student feedback about their perception of digital communication applications in the online learning environment. Online class instructors can then determine what applications students are using and if the applications are helping in meeting the course

objectives. By allowing students to be a part of their online learning it can assist them to be active participants in the online learning environment.

The last recommendation is for universities to offer online class instructors professional development workshops on the use of technology in the online learning environment. As Powell and Kalina (2009) stated, “the more prepared and comfortable teachers are in using effective tools such as conversation, discussion, and inquiry; the more they will use them and students can be adept at thinking and communicating” (p. 247). Because online learning environments and the use of digital communication applications are still a new layer that has yet to settle to the foundation of education, online class instructors should be educated about the online learning environment and the various applications that are available in order to assist in creating significant learning experiences in the online learning environment.

One of the common themes in discussing how online class instructors determine what types of digital communication applications to incorporate into their online classes was the online class instructors’ previous experiences with the application. Often online class instructors lack the previous experiences needed in order to determine how to effectively incorporate digital communication applications into their courses in order to create learner-centered online learning environments. Similar to students sometimes feeling isolated in the online learning environment, I believe that online class instructors are often isolated from others in how they teach their online courses. Although they can rely on their own personal experiences on the use of digital communication applications there is often a lack of sharing of what others are doing in the online learning environment.

Professional development should be conducted in order to allow online class instructors to experience the use of the digital communication applications in the online learning environment and to share their experiences with other online class instructors. As noted by Huba and Freed (2000) “when faculty discuss their responses with each other, they discover common themes to pursue and examine. They also learn that their own unique experiences are not completely unique” (p.280). In order to learn more about the online learning environment all of the online class instructors except Trish, who was teaching an online course for the first time, have attended an online education conference throughout the years. These conferences allow online class instructors experience with various methods of teaching in the online learning environment including the use of digital communication applications. Some of the online class instructors have also attended various online learning workshops to learn more about particular subjects.

In order to gain additional experience about the use of Wimba in the online learning environment two of the participants in the study attended a one-day on campus workshop. Throughout the day the attendees were able to experience the various ways Wimba can be used in the online learning environment. At the end of this one-day workshop the attendees were divided into groups and assigned to create a Wimba classroom session and then conduct the session with other group members. After conducting the session the attendees were invited to come back and share their experience about the workshop. Some noted that even though they sat through the entire one-day session about Wimba they still had a couple of mishaps when conducting the Wimba session, like forgetting to turn on the archive or not paying attention when participants were raising their hands to ask a question. By the end of the workshop,

during the evaluation phase, everyone that attended believed the workshop was extremely beneficial because it allowed the online class instructors the experience of using Wimba by creating and participating in a Wimba classroom session. By having professional development workshops it allows online class instructors to experience the use of different digital applications so they will have more past experiences to draw from when designing online classes.

By allowing various opportunities for students to be active participants in the online learning environment, providing various opportunities for instructor to student interaction, continuously receiving student feedback, and university's offering professional development on the use of various types of technology in the online learning environment, it may assist in creating learner-centered online learning environments.

As distance education becomes more visible and a vital part of colleges and universities need to look at various ways to create meaningful learning in the online learning environment such as allowing various opportunities for students to be active participants in the online learning environment, providing various opportunities for instructor to student interaction, continuously receiving student feedback, and provide professional development on the use of various types of technology in the online learning environment.

Limitations of the Study

Online Research

Online research is still new to many in education and there are limited studies out there on how to design an online research study. Although there are different advantages

and disadvantages of online research, the need for it is critical in order to gain additional knowledge of how students learn and interact in the online learning environment. Just as the traditional and online learning environments are different due to the atmosphere and the transmission of information, the research environments in the traditional and online environments are also different because of the atmosphere and the transmission of information. In designing research studies in the online learning environment, online researchers need to take into consideration the difference in the atmosphere in online learning with no physical interaction and transmission of information where students might not fully understand or read the information about the study. Due to these differences and being a novice to online research there were some advantages and disadvantages I experienced during the study.

One of the advantages of online research is the validity you are able to establish through observation, collecting of artifacts and journaling. In traditional environments most researchers are unable to observe each of the classes and might miss various discussions and not gain an understanding of other factors, such as, the hidden curriculum. In online research, I was able to observe each of the courses each week in its entirety including all assignments, instructor class emails and announcements as well as interactions the students had through discussions. I was also able to have access to that data throughout the research study. Because I had continuous access during the study, while writing my findings I could go back and verify the data with what students said in their interviews, what they wrote on the Blog or how students interacted with one another through the use of digital communication applications.

Another advantage of having continuous access was the use of naturalistic inquiry methodology because I was able to immerse myself in the natural setting of the course throughout the study. By having this type of access to the data for the online research study I was able to continue to observe, record, analyze, reflect, have dialogue and rethink (Erlandson et al., 1993) in the natural setting throughout the study. As themes began to emerge in courses I could go back and look at the interactions from previous weeks in all of the courses. So, when students during the interview told me they thought online content videos were effective I could go back to all the courses in the study and look at the videos, where as in a traditional course I might not have access or a list of the videos. Reflection and verification of information throughout the data collection process added reliability to the study.

A disadvantage in the use of technology to gather data for online research studies is using it to gain consent without having the physical interaction one does in the traditional setting. In the four online courses, approximately seven percent of the students consented to being a participant in the study. One of the courses did not have any students consent to the study. Of the students who consented to the study, five students responded back within the first few days of receiving the email and the other four students consented over a week or two after the online student recruitment consent form was emailed out about the study. This lack of immediate feedback was surprising because I knew the online class instructors had sent emails about assignments during this time and that the students would have needed to read the emails in order to complete their assignments.

For the process of receiving consent from both a novice and a veteran student for an interview in the online courses, I contacted eight of the students in three of the courses. Of the eight students, five students responded back to the email and gave consent. Of these five students four of the students knew of me on campus. One of the students was currently enrolled in one of my courses, one had taken one of my courses the semester before the study, and two knew of me because of their working positions, even though those two had limited interaction, and one was a major in my department and knew of me but I did not know her. The other three students I emailed about the interview did not respond back to the email indicating if they would or would not like to participate in the study. The notion of the four online students who knew of me consenting to the interview and the majority of the online students who did not know of me not replying back gave me an indication on how the lack of prior interaction can have an influence on participation in online research. Based on these previous interactions of the students who knew me I believe it assisted with them consenting to the interview portion of the study.

In order to try and recruit more participants in the future, my recommendation when creating an online research study is for online course researchers to create a researcher-made video and attach it to the recruitment email that is sent to the potential participants. The research-made videos should be something similar to the instructor-made videos that were used in some of the online courses in the study to discuss relevant information about the content. The researcher-made video would introduce students to the researcher and give information to potential participants about the purpose of the study. A researcher-made video would allow the researcher to create research to student

interaction and allow students to, “meet you face to face” and gain insight and information about the study. I believe this type of interaction may have assisted me in recruiting additional participants.

Although only approximately seven percent of the students consented to the study and only five students were interviewed, I was still able to observe the course and the use of the digital communication applications overall by the number of students who interacted with the digital communication applications through posting and how the study participants interacted with other students. For example, on the VoiceThread assignment I could see how many students used the audio or text option and track how many clicked on the link. Also, through the students’ interviews I was able to gain insight on how the students interacted with their online class instructor, the content and other students through the use of the various types of application(s). For example, with Skype I was able to learn from the interview that the participant and her different Skype partners decided to call, email or meet about the assignments instead of using Skype. In the interview students also told about their previous online courses experiences that used digital communication applications. This type of data not only gave me insight into the participants’ experiences but how they experienced the digital communication application with other students.

IRB Concerns

One of the restrictions that I did not foresee was the inability to observe the use of all the different types of digital communication applications in the study due to meeting the requirements for IRB approval. For example since Skype had not been approved by

the university's IRB to be used, I was unable to directly observe students' use of Skype. In order to have received approval both the university IRB and legal department would have had to reviewed and approved the site. For the study I was still able to interview both the online class instructors and students as they discussed their experiences using the different types of digital communication applications, as well as view their assignments and comments that incorporated the use of digital communication applications. But, just like many lawmakers are trying to determine what types of laws should be made to protect citizens and corporations and what can be enforced with the online environment, IRB boards at universities are trying to determine what regulations should be made in online research in order to protect participants in online research studies.

In approving the use of digital communication applications in a study one of the main concerns of the IRB is the privacy of the participants and insuring the use of the application in data gathering will not create any harm to the participant. The concern for privacy can be seen in different types of research data software and the use of observing digital communication applications. For example, if a person were to observe a website that was not secure some of the data used in the study might identify the participant or third parties might have access to the personal information of the participant. Many sites used in research, such as Survey Monkey, can provide the individual computer's ISBN number with the results if the researcher does not opt of out getting the ISBN number. The ISBN number is a traceable identification number for each computer. The purpose of including the ISBN number is to avoid duplications of results from the same person. With the ISBN number attached, there is no confidentiality and if a person speaks unfavorably about an issue, the researcher may then be able to determine who sent the

reply. So, although the use of some websites might benefit a study, if used inappropriately may cause harm to the participant. As technology advances, there will continue to be questions about how the technological tools allow the researcher to follow the basic ethical principal of causing no harm through the use of secure websites and by confirming data is secured and does not identify the participants.

Personal Reflection

This research study has allowed me to apply theories to practice in the design of my own online course. During the time I was collecting the data for the study I was asked to design an online course. The findings from the study have given me in-depth information about the function of digital communication applications that I would have been unable to experience without having conducted the study. Before I began the study and designed the online course, I believed that digital communication applications were the missing link in the interaction that is hard to cultivate in the online learning environment. At first when I started designing the online course I looked at the various types of digital communication applications and thought of the different ways I could use them in my class. From a constructivist mindset, I then thought of all the ways I could use digital communication applications in order to enhance the students' learning experience through interaction. I thought that for the weekly discussions I could give students the opportunity to join a VoiceThread group that provides visual, audio or text options or a discussion board group. But, based on the themes, I soon realized that although interaction is one of the key elements in the online learning environment, the use of digital communication applications might not be as effective as some traditional forms of communication. This is where I began the thought, *just because you use the*

latest technology it does not mean students are actively learning from it. And I realized that online class instructors first need to look at the objectives, then look at the various technology that is available to meet the objectives and then select the type that benefits all students. So, even though VoiceThread might create interaction, the use of the discussion board is just as effective in meeting the course's objectives for the weekly discussions. But if students are to create presentations with visual elements, VoiceThread gives the opportunity for the students to interact with both the content and the student and may be more effective.

The design of my online course is now simple and will incorporate the following digital communication applications: a widget, online content videos, instructor-made videos and Wimba. On each week's course page there is a photo that demonstrates the content of the lesson, the lesson's objective, the lesson's description, a list of that week's assignments, and a widget about current events. On the side of the weekly course page there are five tabs that are standard for the university design format of an online course: instructor's notes, assignments, additional resources, module review, and a class question and answer. On the tab that says, "note from instructor," I will make instructor-made videos, as needed, in order to emphasize the material. For example, on the Investor Relations chapter I will make an instructor-made video and discuss the difference between public and private companies and the importance of stockholders. On the additional resources tab there will be additional information about the content and links to online content videos. For example, for the Investor Relations week, one of the resources is a link to an article about all the public companies in various states as well as links to additional online content videos that give practical applications on how

corporations handle investor relations. For the week where I explain the course's final project I will include an optional Wimba session and, in the additional resources tab, add a link to a Wimba tutorial for students to watch before the session and a link to the presentation so they may review it throughout the course if they are unable to attend the session.

Although I have designed a course based on the findings from my study, one of the most important findings was that online class instructors should not only look at the course objectives but also continue to look at past experiences and student feedback. If, in the future, I am designing other online courses I will incorporate the types of digital communication applications that meet that course's objectives. For my current online course, I will track the use of the digital communication applications used in the course to see if students are actively participating with the applications. For example if there is a video that is not viewed by many students or if the video is two minutes but the average watch time is only twenty seconds then I need to look at finding other videos that might create more awareness for the students. I will also observe and ask for students' feedback on the use of the applications. By providing students additional resources and providing various types of interactions and continuing to hear their feedback I hope to enhance their online learning experience.

Final Thoughts

Throughout the study I have collected data on the various uses of digital communication applications in the online learning environment. Although each digital communication application can create various types of interaction including instructor to

student, student to content and student-to-student, in order for these interactions to create significant learning experiences, instructors need to look at the function of the application and how the application has assisted in reaching the course's learning objective and if students were active participants through the use of digital communication applications in the online learning environment. When selecting a digital communication application, online class instructors need to remember that just because they are using the latest technology does not mean students are learning from it.

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APPENDIX A

ONLINE CLASS INSTRUCTOR RECRUITMENT EMAIL QUESTIONNAIRE

Dear Online Class Instructor,

The Center for Professional and Distance Education (CPDE) provided me with your name, because you are teaching an online course this semester using a learner-centered approach, as a potential participant for a research study I am conducting. As a doctoral student at Oklahoma State University and an educator at the University of Central Oklahoma, I am interested in exploring the use of innovative technology in the online learning environment. For the spring semester, I am looking at observing various online courses that use various types of digital communication applications including Skype, TokBox, Wimba etc. The findings and knowledge gained from the study may provide insight for faculty members and administrators in better understanding the most effective approaches to integrate digital communication applications in the online learning environment.

This research study is titled: The use of digital communication applications in the online learning environment. Specifically, the research will collect information about the use of digital communication applications in the online learning environment. The purpose of this study is to obtain a better understanding of the online learning environment, to explore the various ways online class instructors have incorporated digital communication applications to try and provide learner-centered online environments, and to examine the students' perceptions of the use of digital communication applications in achieving learning outcomes.

For the study, your participation will involve one interview of approximately thirty minutes that will be audio taped, access to your online course for observation of the use of digital communication applications via the Internet through the university's CMS and the digital communication application websites, copies of materials used in the course including textbooks, syllabi, various forms of assessments that use digital communication applications and student evaluation forms that mention the use of digital communication applications. All students in the course will be asked to consent to be

observed throughout the semester. Also, two students from the course will be selected for an interview to discuss their perception on the use of digital communication application in the online learning environment. For the study, a novice student who has taken less than two online learning courses for educational purposes and a veteran student who has taken more than three online learning courses for educational purposes will be selected to interview from each of the selected online courses.

If you are interested in participating in the study please fill out the questionnaire below and email it to me at: klambeth1@uco.edu by Weekday, Month, Day, 2011.

The information you provide in the questionnaire is strictly confidential. For this study all data collected over the Internet and the data stored on the computer will be secured by password protected Internet connections and computers. All written material will be stored in a locked filing cabinet located in the researcher's office. Once the research is completed, all research data will be destroyed by deleting electronic files off the computer's hard drive, shredding all paper documents and erasing all audio files.

1. Online class instructor's name:

2. Online course name:

3. Online course description:

4. Please describe your approach to teaching the online class:

5. Please check if you use any of these types of digital communication application in your online course:

Skype

TokBox

Voice Trends

Voki

Wiki

Wimba

Other(s): _____

Any additional comments about your online course:

Based on the respondents, I will be selecting four online courses for the study. If your online course is selected for the study, I will be contacting you to set-up a meeting in the next two weeks.

Thank you for your time.

Jill Lambeth

APPENDIX B

ONLINE CLASS INSTRUCTOR EMAIL RECRUITMENT EMAIL

Dear Online Class Instructor,

Thank you for your interest in participating in the research study titled: The use of digital communication applications in the online learning environment. From your responses to the questionnaire, I would like to set-up an interview to discuss with you more information about the study. The meeting will last less than thirty minutes. Would you please let me know if you have any time on Tuesday, Thursday or Friday afternoon to meet in your office.

Thanks,

Jill Lambeth

APPENDIX C

ONLINE CLASS INSTRUCTOR INFORMED CONSENT FORM

The use of digital communication applications in the online learning environment.

Dear Online Class Instructor,

This research study is being conducted by Jill Lambeth, a doctoral student at Oklahoma State University and an educator at the University of Central Oklahoma, to study the use of innovative technology in the a learner centered online learning environment. The findings and knowledge gained from the study may provide insight for faculty members, and administrators in better understanding the most effective approaches to integrate technology in the online learning environment.

Specifically, the research will collect information about the use of digital communication applications in the online learning environment. The purpose of this study is to obtain a better understanding of the online learning environment, to explore the various ways online class instructors have incorporated digital communication applications to try and provide learner-centered online environments, and to examine the students' perceptions of the use of digital communication applications in achieving learning outcomes.

Your participation in this research study is completely voluntary. There are no special incentives or direct benefits for participation. There are no negative consequences for declining participation. You are free to decline participation for any reason without explanation and you may withdraw as a participant from the study at anytime without penalty. Also, there are no known risks in participating in this research study beyond those encountered in daily life.

If you agree to participate, you agree to the following conditions regarding your voluntary participation:

- Your participation will involve one interview of approximately thirty minutes that will be audio taped, access to your online course for observation of the use of digital communication applications via the Internet through the university's CMS

- and the digital communication application websites, copies of materials used in the course including textbooks, syllabi, various forms of assessments that use digital communication applications and student evaluation forms that mention the use of digital communication applications. All students in the course will be asked to consent to be observed throughout the semester. Also, two students from the course will be selected for an interview to discuss their perception on the use of digital communication application in the online learning environment. For the study, a novice student who has taken less than two online learning courses for educational purposes and a veteran student who has taken more than three online learning courses for educational purposes will be selected to interview from each of the selected online courses.
- Your participation will be during the Spring 2011 or Summer 2011 semester.
- Information you provide will be secured at all times by the Principal Investigator. All data collected over the Internet and the data stored on the computer will be secured by password protected Internet connections and computers. All written material will be stored in a locked filing cabinet located in the researcher's office.
- The data yielded from this research will be used solely for research.
- Information you provide will be treated with complete confidentiality.
- Any data from this research can be used in preparation or publication for professional literature and reports. When communicating the findings no information will be used that will directly identify the specific participant and each participant will be given a pseudo name.
- The online class instructor will not have access to the list of students in their online course who are participating in the study.
- Once the research is completed, all research data will be destroyed by deleting electronic files off the computer's hard drive, shredding all paper documents and erasing all audio files. All consent forms will be kept for three years in a locked file cabinet in the PI's office as required by the IRB procedures.

To give consent to the terms of the study and to be a voluntary participate in this research study, please sign below and return the form to the Principal Investigator.

If you have any questions or concerns you may contact the Principal Investigator, Jill Lambeth by phone at the University of Central Oklahoma at (405) 947-5926 or by email at klambeth1@uco.edu. If you have any questions about the research and your rights as a research volunteer, you may you may also contact Shelia Kennison, IRB Chair at Oklahoma State University 219 Cordell North, Stillwater, OK 74078, by phone at (405)744-3377 or via email at irb@okstate.edu.

Sincerely,

Jill Lambeth

I agree to the terms of this research study:

Printed Name

Signature

APPENDIX D

ONLINE STUDENT RECRUITMENT AND INFORMED CONSENT FORM

The use of digital communication applications in the online learning environment.

Dear Online Student,

This email is to invite you to participation in a research study titled: The use of digital communication applications in the online learning environment. You are being asked because you are currently enrolled in (name of course) online course this semester. This research study is being conducted by Jill Lambeth, a doctoral student at Oklahoma State University and an educator at the University of Central Oklahoma, to study the use of innovative technology in the online learning environment. As an educator at the University of Central Oklahoma, I am interested in exploring the use of innovative technology in the online learning environment. For the spring semester, I am looking at observing various online courses that use various types of digital communication applications including Skype, TokBox, Wimba etc.

Specifically, the research will collect information about the use of digital communication applications in the online learning environment. The purpose of this study is to obtain a better understanding of the online learning environment, to explore the various ways online class instructors have incorporated digital communication applications to try and provide learner-centered online environments, and to examine the students' perceptions of the use of digital communication applications in achieving learning outcomes.

Your participation in this research study is completely voluntary. There are no special incentives or direct benefits for participation. There are no negative consequences for declining participation. You are free to decline participation for any reason without explanation and you may withdraw as a participant from the study at anytime without penalty. The participation in the study will not have any bearing on your grade. Also, there are no known risks in participating in this research study beyond those encountered in daily life.

If you agree to participate, you agree to the following conditions regarding your voluntary participation

- Your participation will involve the researcher observing the student's use of digital communication applications via the Internet through the university's CMS and the digital communication application websites; the researcher reviewing the final versions of the student's response to various forms of assessments that use digital communication applications; and once the semester is over the researcher requesting any student evaluation forms that mention the use of digital communication applications.
- Your participation will be during the Spring 2011 or Summer 2011 semester.
- Information you provide will be secured at all times by the Principal Investigator. All data collected over the Internet and the data stored on the computer will be secured by password protected Internet connections and computers. All written material will be stored in a locked filing cabinet located in the researcher's office.
- The data yielded from this research will be used solely for research purposes.
- Information you provide will be treated with complete confidentiality.
- Any data from this research may be used in preparation or publication in professional literature and reports. When communicating the findings no information will be used in order to directly identify the specific participant and each participant will be given a pseudo name.
- The online class instructor will not have access to the list of students in their online course who are participating in the study.
- Once the research is completed, all research data will be destroyed by deleting electronic files off the computer's hard drive, shredding all paper documents and erasing all audio files. All consent forms will be kept for three years in a locked file cabinet in the PI's office as required by the IRB procedures.

To give consent to the terms of the study and to be a voluntary participant in this research study and if you are 18 years or older, please hit reply to this email and type "I consent" in the email and hit send.

If you have any questions or concerns you may contact the Principal Investigator, Jill Lambeth by phone at the University of Central Oklahoma at (405) 947-5926 or by email at klambeth1@uco.edu. If you have any questions about the research and your rights as a research volunteer, you may you may also contact Shelia Kennison, IRB Chair at Oklahoma State University 219 Cordell North, Stillwater, OK 74078, by phone at (405)744-3377 or via email at irb@okstate.edu.

Sincerely,

Jill Lambeth

APPENDIX E

ONLINE STUDENT INTERVIEW RECRUITMENT EMAIL

Dear Online Student,

Thank you for volunteering to participate in the research study titled: The use of digital communication applications in the online learning environment. This email is to request your participation in an interview. For the study, I will be interviewing both novice students who have taken less than two online learning courses and veteran students who have taken more than three online learning courses from each of the online courses. The purpose of the interview is to be able to gain a better understanding of the students' perceptions of the use of digital communication applications in the online course.

The interview will be audio taped and will last approximately thirty minutes at a time that is convenient for you. Due to the various locations where the participants may live, the interview will be conducted through (list of the type of digital communication application used in the student's online course). Your participation in the interview is completely voluntary, there are no special incentives for participation, there are no negative consequences for declining participation, and you are free to decline participation for any reason without explanation. You may withdraw from being a participant of the study at anytime without penalty. Also, there are no known risks in participation in this research study beyond those encountered in daily life.

To maintain the ethical standards of confidentiality to the participants, when communicating the findings no information will be used in order to directly identify the specific student and each student will be given a pseudo name. The researcher will not provide anyone including the online class instructors the names of the students who are participating in the study. All data collected over the Internet and the data stored on the computer will be secured by password protected Internet connections and computers. All written material will be stored in a locked filing cabinet located in the researcher's office. Once the research is completed, all research data will be destroyed by deleting electronic files off the computer's hard drive and shredding all paper documents and erasing all audio files. All consent forms will be kept for three years in a locked file cabinet in the PI's office as required by the IRB procedures

To give consent to an interview for the study, and if you are 18 years or older, please hit reply “Yes, I would like to participate in an interview” to this email by Weekday, Month, Day, 2011.

If you agree to the consent to the use of audio recording during the interview please include in the email “I consent to the use of audio recording during the interview.”

Once I receive the email with your consent, I will be in contact with you to set-up an interview time.

If you have any questions or concerns you may contact the Principal Investigator, Jill Lambeth by phone at the University of Central Oklahoma at (405) 947-5926 or by email at klambeth1@uco.edu. If you have any questions about the research and your rights as a research volunteer, you may you may also contact Shelia Kennison, IRB Chair at Oklahoma State University 219 Cordell North, Stillwater, OK 74078, by phone at (405)744-3377 or via email at irb@okstate.edu.

Sincerely,

Jill Lambeth

APPENDIX F

OKLAHOMA STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD APPROVAL FORM

Oklahoma State University Institutional Review Board

Date: Wednesday, March 09, 2011
IRB Application No ED1125
Proposal Title: The Use of Digital Communication Applications in the Online Learning Environment
Reviewed and Processed as: Expedited

Status Recommended by Reviewer(s): Approved Protocol Expires: 3/8/2012

Principal Investigator(s):
Krista Jill Lambeth Kathryn Castle
9647 Hefner Village Blvd. 235 Willard
Okla. City, OK 73162 Stillwater, OK 74078

The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval.
2. Submit a request for continuation if the study extends beyond the approval period of one calendar year. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of this research; and
4. Notify the IRB office in writing when your research project is complete.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact Beth McTernan in 219 Cordell North (phone: 405-744-5700, beth.mcternan@okstate.edu).

Sincerely,



Shelia Kennison, Chair
Institutional Review Board

APPENDIX G

OKLAHOMA STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD MODIFICATION APPROVAL FORM

Oklahoma State University Institutional Review Board

Date: Wednesday, May 18, 2011 Protocol Expires: 3/8/2012
IRB Application No: ED1125
Proposal Title: The Use of Digital Communication Applications in the Online Learning Environment
Reviewed and Processed as: Expedited
Modification
Status Recommended by Reviewer(s) **Approved**
Principal Investigator(s):
Krista Jill Lambeth 9647 Hefner Village Blvd. Okla. City, OK 73162
Kathryn Castle 235 Willard Stillwater, OK 74078

The requested modification to this IRB protocol has been approved. Please note that the original expiration date of the protocol has not changed. The IRB office MUST be notified in writing when a project is complete. All approved projects are subject to monitoring by the IRB.

The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

The reviewer(s) had these comments:

The modification request to expand the sampling population to include one additional on line course is approved.

Signature :


Sheila Kennison, Chair, Institutional Review Board

Wednesday, May 18, 2011
Date

VITA

Krista Jill Lambeth

Candidate for the Degree of Curriculum Studies

Doctor of Philosophy

Dissertation: DIGITAL COMMUNICATION APPLICATIONS IN THE ONLINE
LEARNING ENVIRONMENT

Major Field: Curriculum Studies

Biographical:

Education:

Completed the requirements for the Doctor of Philosophy in Curriculum Studies at Oklahoma State University, Stillwater, Oklahoma in 2011.

Completed the requirements for the Master of Science in Management at Southern Nazarene University, Oklahoma City, Oklahoma in 2007.

Completed the requirements for the Bachelor of Arts in Mass Communications at Oklahoma City University, Oklahoma City, Oklahoma in 1998.

Experience:

University of Central Oklahoma, Edmond, Oklahoma (2008-present)
Instructor, College of Liberal Arts – Mass Communication

Southern Nazarene University, Oklahoma City, Oklahoma (2007)
Adjunct Professor, College of Business – Marketing

Professional Memberships:

American Association of the Advancement of Curriculum Studies

Presentations:

Lambeth, J. (2011). "Using Digital Communication Applications in the Online Learning Environment." Presented at the 2011 American Association of the Advancement of Curriculum Studies Annual Conference, April 2011, New Orleans, LA.

Name: Krista Jill Lambeth

Date of Degree: December, 2011

Institution: Oklahoma State University

Location: Stillwater, Oklahoma

Title of Study: DIGITAL COMMUNICATION APPLICATIONS IN THE ONLINE
LEARNING ENVIRONMENT

Pages in Study: 197

Candidate for the Degree of Doctor of Philosophy

Major Field: Curriculum Studies

Scope and Method of Study: The purpose of this study was for the researcher to obtain a better understanding of the online learning environment, to explore the various ways online class instructors have incorporated digital communication applications to try and provide learner-centered online learning environments, and to examine students' perceptions of the use of digital communication applications in achieving learning outcomes. The study consisted of four online courses where the online class instructors used various types of digital communication applications including: Wimba, GoogleTalk, VoiceThread, online content videos, instructor-made videos, avatars, Skype, a Blog and a digital workbook in order to try and create learner-centered online learning environments. The study consisted of interviewing the four online class instructors and five online students, observing nine online students use of the applications in the four online courses, electronic journaling, observations and reviewing the online courses' artifacts.

Findings and Conclusions: In answering the research questions various categories began to emerge. The common categories for the functions of digital communication applications were to create instructor-to-student interaction, student-to-content interaction, and student-to-student interaction. The common categories for online class instructors determining which types of digital communication applications to incorporate into their online courses were course objectives, online class instructors' past experiences with the use of the application, and students' past learning experience with the application. The common categories for students' perceptions of digital communication applications in online courses were students preferred the use of traditional forms of communication over digital communication applications when both options were available, students were more inclined to use a digital communication application if a grade was assigned as part of the participation, students believed the use of online content videos and instructor-made videos were the most effective types of applications in the learning process and students' perceptions did not differ between novice and veteran students. The various categories indicated that although online class instructors incorporate different types of digital communication applications in order to create various types of interactions in the online learning environment, students' use of most types of digital communication applications did not assist students in being active participants in the learning process.

ADVISER'S APPROVAL: _____