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Understanding Learner Interactions in the Home-Study and Technology-Mediated Seminary Program for Youth in the Church of Jesus Christ of Latter-day Saints

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A dissertation submitted to the faculty of
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Doctor of Philosophy

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ABSTRACT

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Interaction is a core element in the design of blended and distance learning environments. The importance of understanding these interactions and what might increase effectiveness of such interactions in education is paramount for meaningful learning. This dissertation consists of two qualitative case studies designed to provide a rich, descriptive look at interactions in a high school distance/blended-learning context in the home-study and technology-meditated seminary program of The Church of Jesus Christ of Latter-day Saints. In the study article, Moore's (1989) interaction framework was used as a lens for understanding the learner experience. Thematic narratives were used to highlight themes related to students' perceived learning gains from learner-content interaction and their hesitancy to engage in learner-learner and learner-instructor interactions if they had not met personally.

In the second study, Garrison's (2007) Community of Inquiry framework was used to understand the impact that teacher decisions, other than the selection of content, had on the cognitive and social climate of the learning experience. This study describes how a teacher's facilitation of social interaction influences the course learning outcomes. The results highlight the teacher's role in providing the educational and social climate needed to foster learner interactions. This study noted that when the teachers gave learners the opportunity to interact in a live setting, it appeared to foster the relationships needed to interact online. The narratives also highlight how a teacher helped learners interact with one another around content online.

Keywords: distance education, K-12 online learning, blended learning, community of inquiry, teacher presence, social presence, cognitive presence, distance learning interaction, learner-content interaction, learner-instructor interaction, learner-learner interaction

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DESCRIPTION OF DISSERTATION

Structure

This dissertation manuscript is presented in the article format as approved by Brigham Young University's McKay School of Education. Unlike the traditional dissertation format, the article format contains two journal-ready articles with supporting details in appendices. The two journal-ready manuscripts are titled *Meaningful Learning Interactions: Narrative Accounts of High School–Aged Learners in a Blended-Learning Environment* and *Orchestrating Interactions: Narratives of an Instructor's Influence on Social and Cognitive Presence in a K-12 Blended Learning Environment.* The appendices consist of a comprehensive review of the literature related to interaction research and a more detailed description of the methods than space allowed in the journal manuscripts.

Content

Both journal manuscripts in this dissertation were written to answer the call for more qualitative in-depth description and understanding of the learning interactions in the K-12 distance/blended-learning environment (Barbour et al., 2008; Cavanaugh, 2007; Garrison & Cleavland-Innes, 2005; O Dwyer et al., 2007). The research analyzed the learning interactions among content, students, and teachers using Moore's (1989) three types of interaction as a framework (Moore, 1989). The research explored the primary question of "What is the nature of student and teacher experiences in the traditional and technology-mediated models of LDS home-study seminary?" Through narrative accounts both journal articles detail the interactions of students and teachers participating in both the traditional and technology-mediated models of the religious home-study program. The narrative themes discovered and described in both articles were intended to lead to a greater understanding of what helps learning interactions to be

successful in the high school blended learning context. This understanding could also facilitate the development of models and theories that could lead to the design of more effective distance and blended learning experiences (Hirumi, 2002).

The first article, entitled *Meaningful Learning Interactions: Narrative Accounts of High School–Aged Learners in a Blended-Learning Environment*, describes through thematic narratives the experiences from two classes from the technology-mediated program and two classes from the traditional home-study program. These narratives detail the nature of interaction the students and teachers experienced and highlight the nuances and implications discovered in each class. The article discusses the interactions organized by Moore's (1989) types of interaction: learner-content interaction, learner-instructor interaction, and lastly learner-learner interaction.

The second article, entitled *Orchestrating Interactions: Narratives of an Instructors Influence on Social and Cognitive Presence in a K-12 Blended Learning Environment*, uses Garrison's (2007) *Community of Inquiry* (COI) framework to specifically describe the role that the teachers played in the technology-mediated courses. The COI framework categorizes the learning interactions into three interdependent elements: social, cognitive, and teacher presence (Garrison & Arbaugh, 2007). Using this framework was helpful to understand and identify the influence the teacher had on the social and content interactions in the technology-mediated models. With regard to the COI framework, Garrison and Arbaugh state, "Unfortunately, to date there are very few studies that examine the three elements of the framework simultaneously, either quantitatively or qualitatively" (p. 159). This article provides narrative accounts that highlight the differences in how the instructors administered the course. The article details the influence that teacher presence had on social and cognitive presence. The journal ready

manuscript discusses the need for instructors to plan, orchestrate, support, and facilitate meaningful interactions for high-school age learners. The article highlights how a teacher can leverage the interactions for the value-added social and learning benefits possible in a blended-learning environment, making for a more meaningful learning experience.

ARTICLE 1

Meaningful Distance Learning Interactions: Narrative Accounts of High School–Aged Learners in a Blended-Learning Environment

Article Abstract

Using Moore's (1989) framework of distance learning interactions, this qualitative case study describes the nature of interaction in a high school distance/blended-learning context. This qualitative case study compares four classes from two distance delivery models for a high school–age religious education course. Findings revealed that students acknowledged learning gains from learner-content interaction. However, how often and deeply students engaged with course content depended on (1) the strength of the interpersonal learner-instructor relationship and (2) how actively instructors facilitated students with coursework. Learners were hesitant to interact online in an educational setting if they had not met personally. Learners engaged more online when they had personally interacted in synchronous settings and when teachers created opportunities to practice interacting asynchronously. Through narrative accounts this study highlights the importance interaction plays in helping students and teachers overcome the psychological space that exists in distance learning settings.

Introduction

Interaction is a core element in the design of blended and distance learning environments (Hillman, Willis, & Gunwardena, 1994; Holmberg, 1991; Moore, 1989). The framework of "learning interaction" has been used extensively in the research and analysis of blended and distance learning environments (Hirumi, 2002; Picciano, 2002). Researchers have concluded that when there is a richer level of human interaction there is an increase in motivation and persistence to complete coursework, more positive attitudes towards learning, and deeper, more meaningful learning (Garrison & Shale, 1990; Scardamalia & Bereiter, 1994; Schrire, 2006).

The importance of understanding these interactions and what might increase effectiveness of such interactions in education is paramount for meaningful learning (Picciano, 2002). Interaction is often considered as the defining characteristic in educational endeavors (Moore, 1989). Interaction in education is not just the passing on of content but involves an information exchange between two or more persons in which one is to instruct and the other is to learn (Hillman et al., 1994). In sum, the field has accepted interaction as an essential aspect of meaningful learning experiences (Berge, 1999; C. Gunawardena, 1999; Zheng & Smaldino, 2009).

Expanding on his theory of transactional distance, Moore (1989) developed and popularized a framework to categorize learning interactions at a distance. This framework was developed to better understand what could be done to mitigate the psychological and communications separation between the teacher and learner as described in his theory of transactional distance (Moore, 1993). He identified three primary types of learning interactions. These three types of learning interactions are learner-content, learner-instructor, and learner-

learner (Moore, 1989). Interactions between students and content, teachers, and other learners all influence the amount of separation (i.e., transactional distance) experienced by students.

Learner-content (L-C) interaction is the engagement students have with lesson materials and information that the teacher has designated. *Learner-instructor (L-I)*, as defined by Moore, includes the role a teacher plays to counsel and encourage each learner. Specifically, teachers are to create interest, foster motivation, and organize the material in such a way that students can learn. *Learner-learner (L-L)* interaction occurs when students communicate and work with other learners on academic tasks, as well as interact socially with other learners.

In traditional face-to-face educational environments, there is a high possibility of experiencing all three types of interaction. However, when teachers in distance learning contexts want to facilitate and foster interaction, they often run into barriers because of the physical distance that exists between them and the learners (Sabry & Baldwin, 2003; Zheng & Smaldino, 2009). In many cases high quality, timely human interaction is not possible because of time and space constraints. In America, beginning in the 1960's, distance education programs decided it was better to have L-C interaction alone than to not have an opportunity for a learning experience (Peters, 2007). Therefore L-C interaction was emphasized while giving up some of the benefits of human interaction in the learning experience. New technologies in the past decade have made possible an emphasis on exploring the benefits and limitations of human interaction in distance learning environments.

The 2009 Educause Center for Applied Research (ECAR) report indicates that students want to see a balance of instructional technology with the "human touch" in their academic encounters (S. D. Smith et al., 2009, p. 23). The report continues, "Students wrote explicitly about a preference for "real books and people" and said that 'shiny new tech is still no substitute

for well-trained, passionate instructors'" (Smith et al., 2009, p. 23). These sentiments indicate that human interaction is a critical factor in meaningful educational experiences, no matter the mode of delivery and the amount technology utilized. Some studies have also suggested that the greater the interactivity in an online distance course, the lower the dropout rate (Fredericksen, Pickett, Pelz, Swan, & Shea, 2000; Lee, Carter-Wells, Gleser, Ivers, & Street, 2006).

Interaction research is particularly lacking for K-12 populations (Barbour, McLaren, & Zhang, 2008; Cavanaugh, 2007). Because of this, practitioners are left without best practices for meaningful learning interactions in online and blended learning for K-12 populations (Cavanaugh, Barbour, & Clark, 2009; R. Smith, Clark, & Blomeyer, 2005).

This study provides an example of such a practitioner who desired to find ways to increase the quality of educational opportunities for youth in grades 9 through 12 enrolled in independent study distance education programs. The educational institution provides a religious education program for students of high-school age to study the scriptures. The delivery of this program is usually completed through face-to-face instruction, but a home-study program was created in 1954 to reach students who cannot meet daily because of physical distance from available classes. The traditional home-study program uses a blended approach where students use a workbook to do lessons independently four days a week and then meet in a face-to-face class once a week, most often with a parent, to discuss the material for the week. The home-study course has a heavy emphasis on L-C interaction with minimal, if any, human interaction throughout the week. With new possibilities for technology-supported interaction, the organization wondered if and how they could facilitate more meaningful learning experiences by including more learner-instructor and learner-learner interaction in the courses.

Students in the face-to-face traditional religious education program must attend 80% of

the classes to get credit for the course. The average percentage of students in 2008-2009 face-to-face traditional settings who received credit for the religious education course was 69.3%. In the distance home-study program, students are asked to complete 80% of the student manual assignments and attend 80% of the once-a-week face-to-face classes. In this model the average percent of students who received credit for taking the course was 49.2% in 2008-2009.

Because of the lower percentage of students receiving credit in the home-study program and the growing access to technology, the religious institutions sought to define what role technology might play to provide more meaningful and viable learning experiences and interaction for those who participated in home-study classes. In response to this question, a technology-mediated course was developed using the learning management system (LMS) Moodle. The course was designed using the interactive technologies to increase interaction between learners and instructors (L-I) in the online home-study program. In these technology-mediated classes students are expected to use the online site to complete daily work, usually spending 35–50 minutes four days a week. Students receive credit for completing the technology-mediated home-study program by completing 80% of the instructional tasks online as well as attending a face-to-face weekly class (sometimes done via web-conferencing).

The purpose of this study was to understand the nature of interaction in a distance/blended learning context. Specifically, this research sought to understand the experiences of students and teachers who are participating in both the traditional and technology-mediated models of a religious home-study program. An in-depth understanding could facilitate the development of models and theories that could lead to the design of more effective distance and blended learning experiences (Hirumi, 2002).

Methodology

A qualitative case study approach was used in this study. The unit of analysis in this case study was a home-study group, consisting of a teacher, the students, and the students' parents. Four cases were studied that met Miles and Huberman's "bounded context" and "finite amount time" requirements (Miles & Huberman, 1994). Two cases were from traditional home-study classes and two from the technology-mediated classes. The choice to research two cases per model was to provide a broader view of the possibility of interaction, given the variance in structure or leadership provided by the teachers in each of the classes (Garrison & Cleveland-Innes, 2005).

Participants

Teachers. The teachers involved in the home-study program were volunteer teachers. They were invited by a local ecclesiastical leader to teach the course. Their educational backgrounds varied, some have high school diplomas and others attended some college.

Students. The students who participated in the religious program ranged in age from 14 to 18 and were in the 9th to 12th grades. They had differing motivations for taking the religious class, ranging from a personal desire to study the scriptures to the insistence and expectation of their parents.

Parents. A parent of each student involved in the study was interviewed at the end of the year to provide insight into the types of interaction and experience their child had in the course.

Sampling

The sampling in the study was purposeful as described by Patton's (1990) *intensity sampling* which focused on the selection of successful programs from both traditional and

technology-mediated models. The expectation was that successful cases would be more likely to manifest the phenomenon of successful interaction practices specific to each model.

The principal researcher worked with course directors to identify successful programs and teachers. Suggestions of four traditional home-study classes and three technology-mediated classes were recommended for inclusion in the study. The traditional and technology-mediated groups selected from the recommendations had similar geographic and socioeconomic situations. The principal researcher worked in conjunction with each teacher to identify two boys and two girls (ranging from grades 9–12) who they felt would classify as a "typical" student and would probably complete the course. The teacher's opinion concerning the likelihood of course completion was based on the teacher's previous interactions with the student. Thirteen of the sixteen students and parents consented to participate in the research. Three from each of the technology-mediated and total of 7 students from the traditional groups agreed. It was anticipated that two males and two females could be selected to participate. However, it was not possible to get two from each gender from each group because of the small class size and makeup.

The traditional groups will be called *Northern Plains Traditional* (nine enrolled students) *Midwest Traditional* (four enrolled students) and the technology-mediated groups will be called *Northern Plains Technology-Mediated* (T-M) (nine enrolled students) and *Midwest Technology-Mediated* (T-M) (25 enrolled students)." Table 1 provides the description of the four cases with demographic information about the participants (pseudonyms are used).

Data Collection

The study used observations, interviews, and written artifacts as the sources of data for this qualitative case study analysis.

Table 1 *Description of Selected Cases*

Northern Plains Traditional				Northern Plains Technology-mediated			
Role	G	Age	Years of Exp.	Role	G	Age	Years of Exp.
Mrs. Armstrong	F	53	4 years teaching home-study	Mrs. Jones	F	56	9 years: 6 years teaching early-morning classes, 3 years online home-study
John	M	16	11 grade	Jacob	M	16	11 grade
Shauni*	F	15	11 grade	Christine	F	14	9 grade
Blake*	M	15	9 grade	Jessica	F	17	11 grade

Mid-West-Traditional				Midwest Technology-mediated			
Role	G	Age	Years of Exp.	Role	G	Age	Years of Exp.
Mrs. Moss	F	53	3 years teaching home-study	Mrs. Smith	F	47	2 years online home-study
Katie	F	16	11 grade	Jackson	M	14	9 grade
Brandon	M	14	9 grade	Megan	F	16	11 grade
Tom	M	17	11 grade	James	M	16	10 grade
Ken	M	15	10 grade				

Observations. Live field observations along with audio observations by phone were recorded and used as a major data source. In total 13 of the weekly classes were observed and recorded for analysis.

Interviews. Both teachers and students were interviewed three times: at the beginning, middle and end of the year for a total of 12 teacher and 36 student interviews. All interview questions closely followed Spradley's (1979) suggested types of interview questions. The content for questions in the first interview were broad, focused on gathering overall initial opinions and feelings about learning interactions. Additionally, some questions were intended to build rapport by discussing how the teachers and students felt about the course and how they felt about the content and how it was delivered. The questions for the second and third interview were derived from the analysis of the initial phase of the study. They focused the inquiry by

examining the nature of interactions that students were experiencing in the different cases.

Teachers were interviewed for 30–45 minutes and students for 15–25 minutes. A parent of each student was interviewed at the end of the school year, for a total of 12 interviews that lasted about 20 minutes. Interview protocols were guided by constant data analysis for a more focused inquiry, while trying to remain within Spradley's (1979) developmental research sequence as described in the analysis section.

Written artifacts. To aid in triangulation of qualitative data, two types of written artifacts were gathered. First, the teachers were asked to keep a journal of the interactions they had with their students. Second, four weeks of students' work samples were collected to analyze the type and nature of the learner-content interaction of the students.

Analysis

The analysis in this study drew from both Spradley's (1979) developmental research sequence and Stake's (1995) cross-case comparison methodology. Spradley's (1979) method was used because his ethnographic analysis attempts to investigate the participant's view of the experience from an "insider's point of view" attempting to get their descriptions of interaction, which was the specific purpose of understanding interaction from the participants point of view (p. 5). Stake (1995) states, "Each case is studied to gain understanding of that particular entity as it is situated" (p. 45). Once all four cases were looked at individually, the two technology-mediated and then the two traditional were compared with one another. Once this was done, the two different delivery models were compared. The analysis followed Spradley's (1979) methodology through three phases of data collection and analysis. Each phase used Spradley's (1979) domain, taxonomic, and componential analyses according to his developmental research sequence (Spradley, 1979). At each of the three phases, the analysis of previous data directed a

more focused inquiry. In between each of the three phases mentioned above, the data were analyzed and compared based on major themes found in analysis. The researcher used Excel™ and the qualitative research software nVivo ™ to organize, manage, and code the data sources during each phase of the research. This thematic analysis involved looking for overall patterns and melding the concepts into periodic written descriptions.

Narrative Description

In order to provide a vivid context for the themes that were documented in this study, the following section provides a brief narrative from each of the four cases. Not all participants are detailed in the narratives. The narrative quotations and details came from the interviews and observations. The events and quotations in the narratives were all recorded or observed over the course of the year, but for the purpose of this article they are condensed. Pseudonyms are used for the names of the participants. The two technology-mediated cases are described first followed by the two traditional cases. Please refer to Table 1, to follow the narratives and keep the modes and cases distinct. The choice to include certain individuals depended on the context of the narrative and the potential for providing thick description of particular themes from the cases. Following these narratives, the themes from the narratives are expanded and compared.

Northern Plains Technology-mediated Narrative

"Dear Jacob, I wanted to wish you a happy birthday. I am pleased with how well you have done this year in class. I am amazed by your dedication and willingness to work. You will go far in the life! Good luck with soccer this year! Sincerely, Mrs. Jones."

For Jacob, the fact that his volunteer religious teacher would take the time to send him a birthday card means a lot to him. He reported that she is always online responding to his work with positive and friendly feedback. Jacob is 16, a junior in high school in the northern plains.

He is in his third year of the online religious program. Jacob gets online every day, where there are 25–35 minutes of instructional activities. These activities include short video clips, forum discussions, and lesson modules that guide him through a study of a section of scripture. Jacob related that most days he finds the lessons interesting. He admits that some days he doesn't complete his homework, but he has come to appreciate and learn from the online lessons.

Jacob's mother, Mrs. Child, is responsible for teaching Jacob his weekly face-to-face class as part of the program. While they admit they do not hold this class weekly, they have been consistent enough to meet the credit requirement. The classes last for about 15–20 minutes. Jacob admits that he likes that the classes with his mom are shorter than the online lessons. However, Jacob reports that the online lessons have helped him more than the weekly lessons with his mom over the course of the year.

Jacob knows some of his fellow students from church and interacts with them online once in a while. He lives quite a distance from the rest of the students and doesn't know them very well; because of this he doesn't interact with them online. His online interactions have mostly been with his teacher, Mrs. Jones.

Mrs. Jones is responsible for helping her nine students complete the four online days of instruction. Mrs. Jones might visit her students in person once or twice a year to get to know them. The students are spread out geographically, and she does not attend the same congregation as her students. Otherwise, she communicates by LMS or personal contact like birthday cards and phone calls. She chooses communication mediums that enable quicker and more certain feedback.

Mrs. Jones reports that being an online teacher isn't easy, requiring about two hours a day. Each weekday, Mrs. Jones reviews the lesson material; goes through each student's online

work, one-by-one, to make sure each understands and is engaged; provides feedback and encouragement; and adds to the discussion threads. He reported that he wants to get his work done every day because Mrs. Jones would know when he was behind and he doesn't want to let her down.

If a student hasn't been online, Mrs. Jones usually contacts a parent to have them encourage their child. Mrs. Jones' determination and personality help her reach out to all students to help them feel accountable and motivated. Mrs. Jones had nine students start the year; one quit soon after school started and the rest received credit.

Midwest Technology-mediated Narrative

Megan and Jackson, brother and sister, sit in front of their family computer. They are "going to class." The screen shows their teacher's presentation, a list of class participants and a text chat box that allows them to chat with other class members who are online. They log into the course and hear, "So who do we have with us now? Wait, is that Megan and Jackson that just joined us? Great! Let's all share a 'good-news' minute. Let's start at the top of the list and go down," says Mrs. Smith.

"Uh, I got a new cell phone," mutters the first student in the participant list. Everyone hears a "Beep. Beeeeeep," which means that someone else has now logged into the class.

"Hey, it looks like Adam has joined us! Adam, we are all sharing something good that happened this last week. Okay, Megan, you are next on the list," says Mrs. Smith.

"Well, I can't really think of anything. Um… my Mom finally got her car fixed so we have two cars now," says Megan.

Megan, 17, is a junior in high school; Jackson is 15 years old and a freshman. They were going to attend a face-to-face religious class that met for 45 minutes daily at the local church, but

since their mom's car broke down, she and her brother didn't have any way to travel to the daily classes before school. Thus, they enrolled in the technology-mediated program. They participated in the lessons online on a regular basis and complete the instructional activities to receive credit. Once a week, at six o'clock in the morning, Megan and Jackson meet with all the other class members (25 in total) for class using a web-conferencing tool.

For the first few months Megan seemed to get the hang of the online lessons. Although it was difficult for Megan to handle getting up at 6 a.m. once a week for online class, she finds that once she is awake she enjoys participating in class and hearing other students' voices. At first, Jackson didn't like to go online and do the lessons. He had questions while doing the work, but no one was there to answer them. Frustrated, Jackson didn't log into the site for 4 or 5 days. Seeing his inactivity on the LMS, Mrs. Smith called and talked to Jackson's mom. Jackson reported that he was surprised when his mom approached him about not doing his online work. He later realized that Mrs. Smith was watching his activity and won't let him get behind. To Mrs. Smith's credit she caught on early that Jackson and some other students were struggling. She realized, among other things, that the class lacked a sense of camaraderie. She invited her class to come to a social activity where everyone could meet one another face-to-face. Nine of the 25 students came to the gathering, including Jackson and Megan. She fixed waffles, played some get-to-know-you games, and enjoyed a short lesson.

After the first social get together, Mrs. Smith started to notice the students were more willing to comment on each others posts in the forums. During the weekly class, students were more willing to make comments and participate. As the year went on Mrs. Smith noticed that Jackson's work and comments became more thoughtful. Rather than just getting the work done, he was getting more out of his study.

Mrs. Smith had 25 students, which limited the personal time she could have to interact with the students. Mrs. Smith had 25 students start the class, but two quit, three didn't finish enough of the work to receive credit, and 20 received credit.

Northern Plains Traditional Narrative

"Hello?" says a woman's voice.

"Um, is this Mrs. Armstrong?" says Blake, a 15-year-old boy.

"Hello Blake, how are you!" says Mrs. Armstrong. "I didn't think I would talk to you till after the holidays. What can I do for you?"

"Um, I was wondering if there was any book work I could do during the break?" Blake asks timidly.

"You want more work to do over the holidays?" questions Mrs. Armstrong.

"I know it sounds weird, but since I haven't been doing the bookwork during Christmas break, things just haven't been the same. I mean, I just can tell a difference in my day when I do it and when I don't," explains Blake.

"You are an amazing young man! Why don't you look at the workbook and do the activities that weren't assigned over the last couple of weeks. Why don't you start with those?" says Mrs. Armstrong.

"Ok, that sounds good," Blake says.

"Thanks for all your hard work! Keep it up!" Mrs. Armstrong says..

This year is Blake's first year in the religious education program. Blake is different from all of the traditional home-study students in his class. He was able to get himself into a daily habit of completing his bookwork every morning at 6:00 am. When asked why he did it, he said, "I knew it was the right thing for me to do." Each morning he reads an assigned chapter and then

does several instructional tasks for about 20 minutes. No other student in the traditional classes has formed a daily habit of doing their seminary work and would not be described as typical or normal.

Blake attends a weekly face-to-face class at his local church with eight other students. They meet for 45 minutes while Mrs. Armstrong gives a lesson on a section of scripture. Blake's notebooks showed a consistent daily effort, while the other students' notebooks appear to demonstrate sporadic effort in the amount of time and effort spent. Most students admittedly do their homework two or three days a week, but usually end up doing most of the work on Tuesday night, the night before their Wednesday class.

Blake's class is a very cohesive group. Mrs. Armstrong not only provides good lessons, she makes sure the students are involved and participating, often assigning them to work together in groups. Based on class observations the interaction between students had an energizing effect that students favor more than the bookwork they complete at home. Mrs. Armstrong does various things to enhance this energy and sense of unity.

Mr. Armstrong spends three to four hours preparing for each once-a-week, 45-minute class. Mrs. Armstrong has lived in the area for many years and knows each student personally. She frequently contacts students' parents to keep them informed of their students' progress. Nine students began Mrs. Armstrong's class and all completed the year for credit.

Midwest Traditional Narrative

"Okay, you have two minutes to talk about cross-county, football, the weather, school drama, whatever! I am going to invite you into my kitchen to go over your work," Mrs. Moss says. Brandon and Katie immediately start talking about what happened after cross-country practice. Tom and Ken casually talk about how their respective schools have been doing in

football. Mrs. Moss holds several loose-leaf pieces of paper while standing in the doorway between her kitchen and dining room.

"Okay, um Tom, come in here and let's go over your stuff." Tom walks around the table into the kitchen. "So how did this week go?" Mrs. Moss asks cheerfully .

"Um…fine," replied Tom.

Mrs. Moss holds up three pieces of lined paper and asks, "Did you get your homework done? Each day?"

"Yes," mutters Tom.

"Did you do all the work you were supposed to?" asks Mrs. Moss.

"Yeah, I got some done over the weekend but had to finish up some yesterday."

"Okay, it looks like you have done a good job. Oh wait, look at this one right here," she says, pointing to an answer on Tom's homework. "I don't think that you can answer that kind of question with one word."

"Yeah, I was in kind of a hurry at that point," admits Tom.

"Okay, promise me that next week no one-word answers?" questions Mrs. Moss.

"Okay," says Tom.

"All right, then, you are good for this week, good job." Mrs. Moss calls in the other three students and has similar conferences with them about the previous week's work. "Okay guys, wrap it up! Let's start off class by singing hymn number 116," says Mrs. Moss.

"Do we have to sing every verse?" Brandon whines.

"Brandon, you ask me this every week, and what is the response you get every week?" chides Mrs. Moss.

"Sometimes we skip some verses." Brandon says with a smile.

Tom is a junior in high school. He has lived in the Midwest all of his life. He has had Mrs. Moss for the first three years of his religious studies. Tom is the most consistent of the four students. He usually spends 15–20 minutes doing the bookwork two or three times a week. However, he knows that Mrs. Moss doesn't really know how much time he actually spends on his work. Every week he and Brandon, his younger brother, drive to Mrs. Moss's home on Tuesday nights for class. Brandon struggles to get his homework done and often drives Mrs. Moss crazy in class.

Katie Moss is 16 and is Mrs. Moss daughter. Mrs. Moss decided early on to have her daughter not do the bookwork. She says making sure the homework got done was too hard and stressful, so she decided to offer one-on-one classes every morning at 6:00 o'clock in the morning.

Ken, on the other hand, has not only stopped doing the bookwork but also coming to the class. Ken found it difficult to do the bookwork lessons without personal interaction with other students; he quit coming to class at the end of October and never came back. Three of the four students who began the year received credit for the course.

Thematic Analysis

The following section discusses the major themes that emerged from examining the cases in accord with Moore's three types of interaction: learner-content (L-C), learner-instructor (L-I), and learner-learner (L-L). As part of the analysis, two distinctions of L-I interaction were used (learner-instructor interpersonal interaction and learner-instructor content interaction) (Moore, 1989). When the interactions observed didn't fit specifically into one of Moore's three types of interaction, additional interactions were documented and described. Throughout the analysis the names of the participants mentioned in the narratives will be used to tie themes to the cases

involved in the study.

Learner-Content Interaction

The students in the technology-mediated cases ultimately spent more time engaged in L-C interaction than the traditional students. The students' time spent in L-C interaction online was quantifiable; teachers could see when and how long they spent doing work, most lessons requiring the students to do 25–35 minutes of work. Because of this functionality in the LMS, the teacher could be aware of actual effort and intervene appropriately. Teachers in the traditional mode admitted that they could get an idea of the effort students made from their work, but they never knew when and how much time was actually spent; the students and parents reported mostly sporadic efforts for 20–30 minutes two to three times a week. Four of the six students who were followed over the course of the year in the technology-mediated cases felt they had substantial learning gains though the L-C interaction. In contrast, only one of the six students in the traditional cases reported that substantial learning gains came from L-C interaction. However, all students involved in the traditional classes mentioned that they had learned something that they would not have learned on their own without the online lessons or the bookwork. The following will describe some nuances that were found in L-C interaction when comparing the two modes of delivery.

Students in the technology-mediated cases all reported that it was difficult to get in the habit of spending 30–45 minutes a day doing the work. One student mentioned, "If you miss one day then you just keep missing days...then you learn it's easier just to do it every single day." One student from the tech-mediated class said, "She (the teacher) knew when I would get online. If I didn't do yesterday's work I knew that I would have an email from her." Based on the observations of the teacher's effort to facilitate the course the technology-mediated teachers

could manage, encourage, and provide timely feedback to help students spend the time needed to engage with the content.

When asked what about the content was meaningful to them, the tech-mediated students often indicated that the video elements of the course were a more enjoyable way to receive content than just reading text. Having higher-fidelity content through hearing music and voices and seeing faces and pictures, as in the video aspects, made the content livelier. Based on interviews with the students, they reported that it was easier (i.e., took less cognitive effort) for them to engage with the multimedia content. Possibly video aspects enabled students to concentrate more when being asked to show content mastery. The technology-mediated cases could see and respond to one another around the course material. The traditional students didn't experience this variety in both receiving content and producing work. Also, traditional students did not have any opportunities to communicate with the teacher or other students about content throughout the week. The lack of variety and connectivity could contribute to why most of the traditional students reported that the bookwork was an onerous task.

When comparing the instructional activities from both contexts and looking over the students' work, there was a difference in writing voice between the online and printed material. The online material was written in a more direct, personal tone about situations teenage learners might find themselves in, while the traditional material seemed to be written in a more formal voice for third-person application rather than first-person application. The technology-mediated students (5 of the 6) mentioned that the content was written so that the content (scriptures) seemed relevant to their lives. Jacob from the Northern Plains T-M class said, "They ask us questions about how I would apply [the lesson] to our lives. They give us situations and we have to give advice on how I would act if I were in that situation." Jacob also reported that because he

was asked to write answers directed toward life application, about what he would do or say to others in certain situations, he felt more confident in talking to other people about his beliefs.

What seemed to be confirmed from both contexts is that L-C interaction is essential to any distance/blended course. The following quotes characterize sentiments towards L-C interaction from both modes of delivery. Blake from the Northern Plains Traditional class said, "[From the] homework I learn a lot, about like what I'm capable of learning by myself and what I can do." Jackson in the Midwest T-M class said, "[The online lessons] really helped me to read the scriptures and be able to figure out what's going on and be able to understand what they're talking about so that I can fully understand and learn from it." These responses seem to confirm Holmberg's ideas of "guided-didactic conversation," i.e., that course content could be written in such a manner that a learner could interact through a didactic conversation with the course content (Holmberg, 1999). Students' work examples and interviews indicated that they appreciated the lesson material that was written to involve them "emotionally" in taking a "personal interest" in the subject and its problems (Holmberg, 1989, p. 34). In other words, through this "conversation" written in the content, students would be able to engage mentally in order to understand the words on the page.

In the narratives above, the students acknowledged learning gains from independent L-C interaction; however, all of the students recognized how much easier and more enjoyable it was to be in class versus having to read and do homework. This general desire towards less work or effort was noticed in all students in the study. However, the students in the traditional classes seemed to have a harder time getting into the habit of sitting down and doing their homework, and largely favored the face-to-face interactions. One such traditional student said, "The reading I get a lot out of but the homework actually in itself … I mean, it kind of makes you think of an

angle, but personally I enjoy talking and thinking it over with other people to thinking it over myself and writing it down. I'm not much for writing stuff down."

Learner-Instructor Interaction

Learner-instruction interaction was broken down thematically into two categories of L-I interaction. First, L-I interpersonal interaction consists of communication between a teacher and learner in which the teacher attempts to establish a relationship of trust and respect with the student as well as those actions when the teacher tries to promote student social interaction. Second, L-I content interaction entails all communication related to coursework in both asynchronous and synchronous environments. This distinction includes all help and support the teacher provides the student to meet course requirements. This type of interaction also includes teaching time when the teacher relays content to the students. The two traditional cases had similar trends with regard to L-I content interaction but the technology-mediated cases had different circumstances that resulted in subtle yet notable differences in the experiences of the students.

L-I interpersonal interaction. The religious education program in this study is staffed by volunteer workers, and the students are not obligated to study. Because of this, each teacher reported the desire to create meaningful learning relationships with the students individually and with the class as a whole to keep them actively involved and to make a difference in the students' life. All four teachers in this study expressed the understanding that they weren't just teaching lessons, they were teaching students. Each teacher in this study placed high value on fostering social interaction as a class to build a sense of community. Mrs. Moss, the teacher for the Midwest traditional, said,

My relationship grew by sharing quality time, enjoying their personalities, outside the

curriculum, and spending quality time discussing these things so they know that you care about them. We went to football games and to cross-country meets. You just can't be a face in class; you have to actually get to be part of their lives.

Some teachers were able to create strong one-on-one teacher-student relationships to motivate and help students complete the course, while others, specifically Mrs. Armstrong and Mrs. Smith, used social interaction and friendship with the class to provide additional levels of support and motivation for the learners to help them complete the course.

An example of effort towards this type of one-on-one learning relationship was illustrated above when Mrs. Jones reached out to her students by sending them notes and cards. In an interview with Jacob, when talking about Mrs. Jones, he mentioned receiving the birthday card and that it was meaningful to him. In the Northern Plains traditional class, Mrs. Armstrong had a chance each week to review the students' homework in their notebooks. After reviewing the work she made it a habit of writing a paragraph to students to thank them for their work and to compliment them on something that they did. One student said of Mrs. Armstrong, "She says the same thing my parents do but it's so much easier to listen to her when she says it." In an interview with a parent of one of Mrs. Armstrong's students, the question was asked, "What helped your son to do his bookwork at home?" In response the parent said, of Mrs. Armstrong, "[She] was the biggest motivator; she has such a great personality; and she has inspired my son in a lot of ways and he doesn't want to disappoint her."

The structure and function of L-I interaction involving both interpersonal and content within the traditional cases was very similar. The groups had similar opportunity to interact face-to-face in a weekly class and at local church meetings. This face-to-face time seemed to strengthen interpersonal bonds between the teacher and students. Students from the traditional

cases consistently commented that their face-to-face/class interactions were their most memorable experiences form the course.

In the technology-mediated cases, the teachers had different opportunities for L-I interaction. The students in the Northern Plains T-M course each had two teachers, a face-to-face teacher and an online teacher. The face-to-face teacher (a parent) met weekly with the students in their home; if two students in the course lived close to one another they met together. The online teacher, Mrs. Jones, interacted with the students asynchronously through the course site. She met the students face-to-face once or twice over the year at other church functions, but never together as a class. She sought other ways to communicate with students in a meaningful way by which she could know whether the students understood what she was trying to convey.

The Midwest T-M class had one teacher, Mrs. Smith; she took care of the weekly class as well as helping the students through the online assignments. The class was held weekly in a synchronous setting in where students could hear one another's voices and see the teacher's computer. She also met her students face-to-face a couple of times over the year. These events were planned specifically around the participants in the class in order for them to meet and get to know one another and learn together. From class observations and interviews, it was apparent that meeting together as an entire class in a live setting versus meeting in smaller groups with parent/ teachers influenced the strength of the personal relationships formed with the teachers.

Learner-instructor content interaction. Three teachers from the four cases were able to hold a synchronous class weekly with their students. All three cases demonstrated similar class structure from week to week, including 10 to 15 minutes for announcements and activities to get students ready for the lesson (less content related, more social interaction). The remaining time was spent teaching from course materials covering topics related to the week's written

assignments.

The Northern Plains T-M classes had students meet in small groups in homes with a parent acting as the teacher. Mrs. Jones in the Northern Plains T-M and her class did not have any shared experience of live class discussions about content that seem to have been very important to the other three cases. Her L-I content interaction was based only on the feedback, support, and encouragement she gave online in responding to their assignments. The Northern Plains T-M class did not have the opportunity to discuss the content of the course all together, but rather in small one-on-one student-parent groups. Because of this, the students felt disjointed from one another during the four days of online instruction, when they were to learn together. Additionally, Mrs. Jones felt alone. She mentioned that interacting only in the online environment became an onerous task. From the class observations, the students in this case had very different face-to-face class experiences; the quality of the class was dependent upon how well the parents were able and willing to teach. For example, the suggested time for such a class was 45 minutes. One class when being observed never went longer than 15 minutes. In the Midwest T-M class, Jackson expressed the need for this live interaction around the content:

> I think that the lessons with Mrs. Smith helped the most because when I am reading something by myself and I don't understand it,… it won't mean much to me if I don't understand it… When I do the lessons online, like I still might not understand it, it is still helpful to a certain extent, but when we are online talking with Mrs. Smith I almost understand exactly what is going on, so I usually get the most out of that. The real-time classes made it easy to get a response back quickly; otherwise you have to wait till she gets to it. She would ask us questions to try to get us to participate and be part of the class.

Jackson's words, together with the students' reported unwillingness to engage with the content when they study independently, seem to indicate that having a synchronous class with all participating students (face-to-face or via technology) is a very important way the teacher can help students have an overall meaningful learning experience.

From observing her efforts online to review and provide individual feedback, Mrs. Jones from the Northern Plains T-M class tried to compensate for not having a live class setting by increasing the amount of time spent reviewing and giving feedback on what the students wrote online. She spent more time per student reviewing and providing feedback on student work than Mrs. Smith and the traditional teachers did. However, the time spent giving feedback on the independent study homework wasn't as important to the students as providing feedback in a live setting. For example, one technology-mediated student said at a mid-year interview, "Um, I think she checks my work… I don't know, because I usually don't go back and check it. I don't know. I guess she does because she grades it all so … I don't know." The technology-mediated students were more concerned with getting credit for the day rather than the learning through asynchronous feedback with the teacher, however, even though they didn't always read the specific feedback, most were aware that the teachers were reviewing the work. When discussing how the teachers reviewed their work students were mostly concerned about what they had to complete next in order to receive credit. They only would go back to look at the teacher's feedback when they didn't get credit for a particular day. The absence of live feedback resulted in fewer interactions online around the content. This could be because students received credit for completing instructional activities and not for interacting with the teacher and other students.

It must be pointed out that Mrs. Smith's efforts to help her class get to know one another by carefully planning social interaction in the weekly class, along with the times they met

together face-to-face for class activities allowed her to help build a cohesive class unity. She leveraged these interactions to help the students feel more comfortable around each other in a live or face-to-face setting. She needed to capitalize on such interactions because she could not spend adequate time one-on-one with her 23 students to create an effective learning environment. None of the students from either case preferred working independently. They all preferred having online or face-to-face human interaction to just interacting with the content. Practitioners should attend not only to course design but also consider the opportunities for teachers and students to interact in a live manner around things not directly related to the course, as well as related to the content of the course.

Learner-Learner Interaction

The level of learner-learner interaction seemed to be influenced by two factors: including (1) how well the students knew one another outside of the religious course and (2) how actively the teachers worked to foster such interaction.

The technology-mediated cases the students had access to a student messaging system. In the Northern Plains T-M class the students used the messaging system with those whom they knew personally from their own congregation. Most often they asked one another questions regarding the course. The Midwest T-M class had similar interaction at the beginning of the year, but as the students got to know one another through the weekly classes as well as the handful of face-to-face class meetings, they interacted not only regarding course questions but also socially. For example, in the Midwest class, the total number of posts to forum discussions were much higher than those at the beginning of the year.

Another place that students in the technology-mediated cases could interact was through forums in the online course. Each week of instruction had two to three forums that the students

were to comment on as part of their instructional tasks. Most of the time the students supplied their responses to the forum and went on to the next instructional task. Unless designated to do so, students didn't read other students' responses. However, even though the students didn't often read other students' comments, many mentioned that they appreciated reading other students' posts. For example, a Northern Plains T-M student said the following about the forums: "I can look at other people's answers and see what other people think so I can get to know the other people in my class a little better. I can say what I think but also hear what other people think and learn from them also." Three students reported reading other students' posts provided insights and was beneficial to their learning. This type of interaction has been termed as vicarious interaction by Sutton (2001). This vicarious interaction is based on the principle that enhanced achievement may occur even when all students do not interact directly (Sutton, 2001). This illustration supports Sutton's (2001) claim that those not directly involved can learn from observing the direct interaction. For the students in the technology-mediated environment, the students don't have to respond to a forum to learn; they could just read other comments or conversations from the forums for learning to take place if they took the time to read them.

The result of not having any chance for live interaction and little encouragement for asynchronous interaction can be seen in the following example. In week 30 (of 36 weeks) the students were given a forum in which they were asked to participate during the week. At the end of the week, the students in the Midwest T-M had 45 student comments made to the forum while the Northern Plains class had one student make one comment to the same exact assigned activity. This example seemed to emphasize the importance that if students are expected to interact online around content, the more they get to know one another in a live setting (face-to-face or live audio/video) the more comfortable they feel with one another and will engage with one another

online.

The traditional cases also had the live face-to-face settings that allowed the students to get to know and feel comfortable with one another, but they did not have a way to interact with one another around content throughout the week like the technology-mediated classes had through the forums. However, similar feelings were expressed about learning from comments from their peers in their face-to-face classes. From observing the live classes, the interest level and excitement of the students increased when the students were asked to verbalize what they had learned and to share their opinions. This interest in hearing what peers had to say helped students not only gain a different perspective on the content, but also get to know and appreciate one another as individuals. In the traditional cases, the students' personalities and how well they got along seemed to dictate how well and how often the L-L interaction happened, more so than in the technology-mediated cases. The Northern Plains traditional cases were more open and friendly with one another in class than the Midwest Traditional group. They had good rapport but interactions were limited because only three students were in the course and two of them were siblings.

In sum, the L-L interaction that took place in all cases depended on how well students came to know one another and how often the teacher stressed the importance of them learning from one another.

Limitations

The first limitation of this study was that just one educational context, a distance religious education context, was examined and the results are not generalizable beyond this unique setting and group. Other types of curriculum that are taught in a distance education context also need to be qualitatively studied. Subject matter and context may influence the communication and

support needed by the high school–age learners. For example, the support and structure provided by a teacher in a math course would likely be different from that provided in a religious education setting. Studying various settings will provide increased understanding of the type of support and structure that is needed for the K-12 learner. The second limitation was that much of the qualitative inquiry was completed from a distance. As a result the researcher may not have fully understood each of the individual cases, because of this, the participants full disclosure is likely incomplete. The four standards outlined by Lincoln and Guba (1985) and Guba and Lincoln (1989) for naturalistic inquiry were used to verify credibility, transferability, dependability, and confirmability of the inquiry. Also, where possible the researcher visited on location in the several states to meet face-to-face with the participants and ultimately met 10 of the 16 face-to-face, some on multiple occasions. Third, the principal researcher is employed by the educational entity studied in the research. This relationship may have influenced the personal proclivities of the researcher. Acknowledging this, member checks and peer debriefing were used to the extent possible to overcome this limitation. Additionally, the researcher's presence itself can unduly influence and confound results. Fourth, the age of the students, their maturity, experience, and ability to communicate are more limited than older subjects who are typically studied in interaction research.

Conclusions

This article described the learning interaction in a high school–age, blended learning environment using Moore's (1989) framework of distance learning interactions. Because most distance learning research frameworks have been derived from research in a post-secondary context, this article sought to document and describe interaction for a K-12 context. Also, the themes discussed in this article could prove useful for practitioners involved in K-12

distance/blended-learning contexts. The themes discovered echo the importance that interaction and communication play in helping students and teachers overcome the psychological space that exists in all distance learning settings, as described in Moore's theory of transactional distance (Moore, 1993). The factors that influenced the psychological space experienced by instructors and students given the unique age-related characteristics in this study were (1) the more individualized (emphasis on interpersonal relationship), (2) human (warm, high-fidelity), and (3) timelier the interaction, the more likely those involved will feel connected to their experience. The following conclusions summarize the major themes discovered in Moore's (1993) research, which could prove helpful for those designing similar blended-learning environments.

Learner-Content Interaction

Students in all cases acknowledged learning gains from the independent study aspects of the courses. Because students' effort and time spent doing the independent work in the technology-meditated cases could be tracked, teachers could manage, encourage, and provide timely feedback to help students spend the time needed to engage with content more than teachers of the traditional cases. Four of the six technology-mediated students acknowledged that their greatest learning gains came from the independent study (L-C) work. Only one of the six traditional students felt the independent study work was the most beneficial source of learning. The students in the traditional classes had much harder time getting into the habit of sitting down and doing their homework and largely favored the face-to-face interactions. While all the students (in both the technological-mediated and traditional contexts) acknowledged learning gains from independent L-C interaction, they all recognized how much easier and more enjoyable it was to be in class versus having to read and do independent homework. If novice learners are expected to engage with content through independent study, the content should be

written in such a way that it is personally relevant to the student because generally the self-efficacy skills of high school age learners are limited (Rice, 2006).

Learner-Instructor Interaction

Learner-instructor interpersonal interaction. The students' efforts in this study were greatly influenced by the quality of the human relationships they had with their instructor and other students. The relationship they formed with the teacher was key in helping them engage with and spend the time needed to learn things that they wouldn't have done otherwise. Each case illustrated that the teachers tried to create a strong one-on-one relationship to motivate and help students engage with the course material and complete the course. This theme highlights the need for those designing blended learning environments in a K-12 context to take the opportunity to strengthen the student-teacher relationship. This relationship appears to be extremely instrumental in helping students engage with content and ultimately complete the course.

Learner-instructor content interaction. The time teachers spent giving feedback on independent study work wasn't appreciated by students as much as feedback given in a live setting. The individualized asynchronous feedback could not benefit the whole class. Having a face-to-face or live virtual setting (web-conferencing) where the teacher provided immediate feedback strengthened relationships among students. Interaction with the instructor also influenced how actively the students participated over the course of the year both in completing the online assignments and attending the weekly class. Practitioners should not only attend to course design but also consider the opportunities for teachers and students to interact in a live manner around things related to the content of the course.

Learner-Learner Interaction

Learner-learner interaction in this study depended on (1) how well the students knew one another offline or outside of the religious course, (2) how actively the teachers worked to foster student interaction, and (3) how explicit the teachers were in helping the students understand the importance of learning from one another. Students learned from and appreciated one another's comments in an asynchronous discussion board and face-to-face classes even though they didn't reply to or reciprocate verbally or by text. If students are expected to interact online around content, those designing these environments should consider the three following points. First, although students in this age group might be digital natives they need to be explicitly taught how to be active online learners, Secondly, practice opportunities are needed to help students become active online learners. Third, students need opportunities in a live setting (face-to-face or live audio/video) to get to know one another and to be more comfortable engaging with one another online.

These descriptions could identify similar or different themes concerning the needs of high school–age learners in a distance/blended learning context. It would prove useful to further use existing post-secondary distance interaction frameworks to discover where they might fall short in describing and understanding K-12 blended-learning contexts; doing so will lead to a more refined theory specific to K-12 learners which will foster the development of more effective and meaningful designs of distance learning experiences.

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ARTICLE 2

Orchestrating Interactions: Narratives of an Instructor's Influence on Social and Cognitive Presence in a K-12 Blended-Learning Environment

Article Abstract

This qualitative case study used Garrison's *Community of Inquiry* (COI) framework to discover and describe how the element of teacher presence impacted the social and cognitive elements of a K-12 blended learning environment. This study provides narrative accounts of how two teachers' efforts and decisions, beyond the selection of content, influenced the development of the social and cognitive elements of the course. The findings revealed that the social and learning benefits afforded by social interaction played an important part in leading students to engage cognitively with the content. The study highlights the important role of the teacher in fostering a social climate needed for learner interaction. In this study, the students' willingness and persistence to interact cognitively was influenced by a meaningful one-on-one relationship with the teacher. The narratives also highlight that when a teacher provides students the opportunity to interact in a live setting appeared to foster the relationships needed to interact online. To help students interact with one another around content online, teachers could provide practice opportunities for students to interact asynchronously about interesting topics not related to content.

Introduction

Interaction is a core element in the design of blended and distance learning environments (Hillman, Willis, & Gunwardena, 1994; Holmberg, 1999; Moore, 1989). Shale and Garrison (1990) state that education "in its most fundamental form… is an interaction among teacher, student, and subject content" (p. 4). The "learning interaction" framework has been used extensively in the research and analysis of blended and distance learning environments (Hirumi, 2002; Picciano, 2002).

Several frameworks have been developed to study distance-learning interactions (Anderson & Garrison, 1995; Hillman et al., 1994; Moore, 1989; Sutton, 2001). One prominent distance design and research framework is Garrison's *Community of Inquiry* (COI). The COI framework categorizes the learning interactions into three interdependent elements: social, cognitive, and teacher presence (Garrison & Archer, 2007). Social presence is characterized by ability of participants to communicate purposefully in a trusting environment and develop inter-personal relationships (Rourke, Anderson, Garrison, & Archer, 2001). Teacher presence entails the design, facilitation, and direction of cognitive and social processes. Cognitive presence is the extent to which the participants in a community of inquiry are able to construct meaning through sustained communication or interaction with the teacher, with other learners and the content (Garrison, Anderson, & Archer, 2001). Each element of COI has been extensively researched, mostly in higher education settings; empirical research has supported that COI is a useful and coherent theory of online learning (Garrison & Arbaugh, 2007). However, Garrison and Arbaugh (2007) state, "Unfortunately, to date there are very few studies that examine the three elements of the framework simultaneously, either quantitatively or qualitatively." (p. 159). Garrison and Arbaugh continue,

> The challenge for researchers and practitioners is to better understand the interdependence of the three elements. Each element influences the others. We need to understand the specific nature of this influence under various educational contexts. (p. 166)

The purpose of this study was to qualitatively understand the interdependence and influence that teacher presence has on both cognitive and social presence in a K-12 blended learning context.

Interaction between teachers and students is as important in a distance context as it is in any learning environment (Chickering & Gamson, 1999; Moore & Kearsley, 1996; Muirhead, 2000; Thurmond & Wambach, 2004). Studies of audio- and video-conferencing demonstrated that effective learner-instructor interactions can take place in a distance setting (Hearnshaw, 2000; Katz, 2000; Parker & Olgren, 1980) as well as in a text-based medium (Garrison, Anderson, & Archer, 2001b). Research has also indicated that instructor presence in the online environment is essential in distance learning experiences (Gunawardena, 1999; Volery, 2001). Studies have also shown that students value the interaction they have with their teachers (Jiang & Ting, 1999). With regard to COI, Garrison, Anderson and Archer (2010) state that research has shown that teacher presence "causally influenced" both cognitive and social elements (p. 7). .

Garrison, Anderson, and Archer (2010) state, "there remains theoretical and practical merit in continuing to distinguish…the teaching presence construct" (p. 7). Research has emphasized the role of teacher presence independent of the other types of interaction; what has yet to be fully understood is the influence teacher presence has on the cognitive or social presence in various contexts.

One context in which the role of the instructor needs to be more fully understood is the burgeoning field of K-12 distance/blending learning (Cavanaugh et al., 2004; Rice, 2006; R.

Smith et al., 2005). Given the disparate levels of self-regulatory skills and motivation of high school–aged students, the role and support of an instructor may be an even more important aspect of K-12 than of adult-oriented distance courses. Rice (2006) states, "The question of the effectiveness of student support is critical in the K-12 context, especially when considering the alternative nature of the educational experience" (p. 441). Thus, the element of teacher presence should be investigated in K-12 research and practice. Various research methods could be used to provide insight into how these types of interaction influence one another. Garrison and Cleveland-Innes (2005) noted that methods, such as survey research, used to understand the interactions seemed to give us only part of the picture. Garrison and Cleveland-Innes (2005) stated, "We need to have a qualitatively richer view of interaction. There is a strong need to study the qualitative nature of online interaction in terms of teaching and learning approaches" (p. 145). Bianco and Carr-Chellman (2002) explain that survey research on perceptions of technology-mediated distance learning courses are helpful, but that "no matter how popular, convenient, or well-funded online learning options may be, their impact on learners' experiences as understood through qualitative inquiry should be carefully considered by all practicing instructional designers" (p. 252). Few studies have qualitatively studied K-12 student perceptions and opinions about their distance education experience (Barbour, McLaren, & Zhang, 2008). Some qualitative research about learning interactions has been conducted in the K-12 setting, but most of the qualitative research completed thus far was gathered by first-person practitioners through experience and not based on deliberate research (Cavanaugh, 2007; Cavanaugh et al., 2009). A qualitatively rich description of a K-12 blended learning context can provide detail needed to see the multidimensional nature of how Garrison's (2007) three elements of COI are interrelated.

Methodology

In this study, two blended 9-12 grade classes from a religious education institution were qualitatively investigated for an entire school year. Both teachers were provided the same online asynchronous content with the requirement to hold a weekly class that could be held face-to-face or synchronously through technology. The teachers had the ability to add to or change the content of the course. They also had the freedom to personalize and emphasize the interactions they had with the students. In-depth qualitative case studies were used to discover, describe, and understand how the teachers' efforts and decisions (how they chose to instruct, facilitate, and support their students) influenced the development of the social and cognitive elements of these K-12 blended learning environments. Specifically, it was asked, how did teachers structure and orchestrate their interactions within their course and what impact did this have on the social and cognitive climate of the overall educational experience?

Two cases that met Miles and Huberman's (1994) "bounded context" and "finite amount time" requirements were studied. The unit of analysis in this case study was a technology-mediated class, consisting of a teacher, students, and the students' parents. The education institution in this study provides religious education courses for high school–age students in a distance/blended learning environment.

Participants

Students in the technology-mediated religious course were expected to access an online class using the learning management system (LMS) Moodle to complete asynchronous instructional tasks, spending approximately 35–40 minutes each day, four days a week. The course took advantage of technologies to foster interaction between learners and instructors.

Additionally, students were expected to attend a weekly synchronous class, which could be held face-to-face or virtually. The students received credit for the course by completing 80 percent of the assignments online as well as attending 80 percent of the weekly classes either done face-to-face or through web-conferencing.

Teachers. The teachers involved in the program were volunteers requested by a local ecclesiastical leader. Both teachers in this study completed high school and attended some college courses.

Students. The students who participated in the religious program ranged in age from 14 to 18 years and were in the 9^{th} to 12^{th} grades. Their motivations for taking the religious class varied from a personal desire to study the scriptures to the insistence and expectations of their parents.

Parents. A parent of each student involved in the study provided insights into the types of interaction his or her child had in the course.

Sampling and Data Collection

The sampling in the study was purposeful as described by Patton (1990). The purposive sampling guided the selection of good/successful classes that used the technology-mediated program. The sampling in the study was purposeful as described by Patton's (1990) *intensity sampling* that focused on the selection of successful programs from both traditional and technology-mediated models. The expectation was that successful cases would be more likely to manifest the phenomenon of successful interaction practices specific to each model.

The principal researcher worked with course directors to identify successful technology-mediated courses. Suggestions for three courses were recommended for inclusion in the study. One course was eliminated because the instructor chose not to participate for personal reasons.

The principal researcher worked in conjunction with each teacher to identify student participants of both genders (ranging from grades 9–12) who they felt would classify as a "typical" student and would probably complete the course. The teacher's opinion concerning the likelihood of course completion was based on the teacher's previous interactions with the student. Three students from each of the courses agreed.

The two classes will be called *Northern Plains* (two females, one male) and *Midwest* two males, one female). The Northern Plains class had one online teacher, nine students, and six support teachers who taught weekly face-to-face classes in the cities where they lived. The Midwest class had one online teacher and 25 students; the teacher facilitated the students through the online work as well as taught the weekly class virtually (students saw the teacher's computer screen and heard one another by phone). For a more focused inquiry three students from each class consented to participate.

The study used observations, interviews, and written artifacts as the sources of data for a qualitative case study analysis, in addition to live field and distance audio observations. In total, three classes of the Northern Plains and four from the Midwest were observed and recorded for analysis. Teachers and students were interviewed three times, at the beginning, middle, and end of the school year for a total of six teacher interviews and 18 student interviews. All interview questions closely followed Spradley's (1979) suggested types of interview questions. The content for questions in the first interview were broad, focused on gathering overall initial opinions and feelings about learning interactions. The questions for the second and third interview were derived from the analysis of the initial phase of the study, specifically structural and contrasting questions were asked to identify the participants understanding of their interactions.

A parent of each student was interviewed at the end of the school year, for a total of six additional interviews. Interview protocols were guided by consistent data analysis allowing for a more focused inquiry as the research developed. To aid in triangulation of qualitative data, two types of written artifacts were gathered. First, the teachers were asked to keep a journal of the interactions they had with their students. Second, four weeks of student work was collected in both cases in order to analyze the type and nature of the student's cognitive engagement.

Analysis

The analysis in this research drew from Spradley's (1979) Developmental Research Sequence (DRS) and Stake's (1995) cross-case comparison methodology. At each phase of analysis the data from each class were analyzed separately. Then the two classes were compared. The decisions to analyze the data in this order was made following Stake's (1995) suggestions, "Cases can be identified but usually it is not possible to catch a fuller meaning of the quaintain [program] without careful review of the details of the cases" (p. 40).

In following Spradley's (1979) DRS, a domain analysis was completed at each phase of data collection, clarifying and strengthening the understanding of the terms and phrases used by the participants. Once a robust domain analysis was completed, a taxonomic analysis was performed to establish hierarchical relationships among the categories and utterances used by the participants within each domain. Lastly, a componential analysis was completed to expose the dimensions of contrast between terms used by participants in relation to the student-instructor interaction that took place in each course. In between each of the analyses mentioned above, the data were analyzed and compared in relation to the major themes found in analysis. This thematic analysis involved standing back from earlier analyses and synthesizing the bigger picture of the research. The overall themes were written in the audit trail, and these themes were

visited and revisited throughout analysis. The researcher used Excel™ and the qualitative research software nVivo ™ to organize, manage, and code the data sources during each phase of the research.

Thematic Narratives

The following narratives describe how the two teachers in the study instructed, facilitated, and supported the students in their classes. The cases had the same online structure and content, and students were to complete four days of instructional tasks independently. Both classes held weekly class; however, they were carried out differently. The Northern Plains class held face-to-face classes between a student and their parent. If two students lived in close proximity they met with one of their parents. These meant that the students in the Northern Plains course had one teacher to facilitate and support the online aspects of the course and a different teacher for their face-to-face class. The Midwest class held weekly meetings with all the students together through a web conferencing tool, having the same teacher for both aspects of the course.

On average, 68.4% of students enrolled in the technology-mediated religious program received credit for the course in 2010, but both classes in this study demonstrated above-average completion rates. The Northern Plains class had a completion rate of 88% and the Midwest class had a completion rate of 86 %. However, the value-added social and learning benefits greatly differed between these two classes. One teacher fostered a meaningful one-on-one relationship between her and the students and sought to help them complete the coursework for credit. The other teacher leveraged the social aspects of a blended learning environment to (1) teach her high school-aged students to interact asynchronously with peers, (2) motivate one another to complete the assigned course work, and (3) build a sense of class unity. The narratives illustrate how the

teachers structured and orchestrated the interactions within their own course. They also illustrate how those decisions influenced the social and cognitive elements of their class's overall learning experience. The events and quotations in the narratives were gathered over the course of the year, but for the purpose of this article are condensed. The conversations in the narratives did not take place exactly as presented; however, the statements and sentiments from the teachers and students are those that were expressed in interviews and observed in observations.

Northern Plains

Margret Jones, a 65-year-old volunteer teacher, sat down at the computer and reviewed a list of student names. She thought to herself, "I wonder if Jessica has gotten on to do her work. She is getting behind and it will only get harder for her to get caught up. I wonder how I could get her parents to take interest in her work." She logged in and a message window automatically popped up. She had three new messages from her students. She looked at the name on the first message. She thought, "Oh, good Christine got back to me, she is very conscientious about responding." She looked at the other two messages and thought, "Oh, that's too bad, Jessica didn't write back." She clicked on Christine's message. It read, "Christine [10:28 PM]: Hi Mrs. Jones, I am completely caught up on my work. Just to let you know this week I have practice right after school because we have performances this weekend. I will work on it whenever I can and will finish over the weekend if I have to."

Mrs. Jones clicked in 'reply' and responded, "Thanks for letting me know. I am amazed at all that you are doing. Bless you! Try to log in daily, even if you can't complete everything, it will bless your life! How are the weekly classes you have with your mom? Is Jessica coming to those? Love, Mrs. Jones."

Mrs. Jones clicked on the next message, She read, “Jacob [7:51 PM]: Mrs. Jones, thank you so much for the birthday card that you sent me! That was really nice of you. Thanks for supporting me. It was hard getting into the swing of things this year but I am doing better. I am playing on soccer this year. My mom and I are having our weekly class most of the time. We usually do it Wednesday nights. Thank you!”

Mrs. Jones smiled. Throughout the year she had tried to reach out to her students in other ways than through the computer. She felt that it was more personal and more meaningful if she contacted them outside of the course’s technological means; she wanted them to know that she cared about them and wanted the best for them. It was hard because she never had the chance to talk to all her students at once. At times, she felt lonely sitting in front of her computer. She never had a chance to get together as an online class to talk about what they were learning. For the next two hours she reviewed the work that her students had done for the previous day. She responded to each student’s work with personalized feedback and encouragement. She felt that even though she didn’t see them in person, she could gauge what was going on in their life through the words they wrote. She marked off the attendance for each student in her notebook.

Mrs. Jones needed to touch base with Jessica since she hadn’t logged on for over a week. She clicked “send message” and typed, “Hi, I am missing you! I didn’t see you online this week. Is there something going on that keeps you from getting on every day? This class isn’t just about doing the assignment. It is about coming to class each day, watching the videos and engaging in the class. I cannot mark you here when you don’t even open the site. What can I do to help you? You are getting behind and we need to fix this, okay? You can do it! I’d love for you to message me back!”

The next day Mrs. Jones followed the same routine. She logged into the course and waited for the page to load. To her surprise there was a message from Jesscia. She quickly clicked on her message. It read, "Jessica [10:34 PM]: I am sorry Mrs. Jones, I've just been really swamped with homework. Doing the lessons takes forever, I mean I like them, but it is hard to do every day. The classes we have each week with Christine's mom are good, we do scripture games and watch movies; they are lots of fun. I'll try harder to get online and do the lessons, my parents keep reminding me, and I will try to get caught up this week." Mrs. Jones was grateful that she responded. She was ready to call her today if she didn't. She clicked "reply" and wrote, "Thank you for writing back! High school does get crazy! Keep up the hard work. You will be blessed for doing it! Love, Mrs. Jones." She couldn't believe she was getting used to spending two hours a day reviewing work and following up with her students. She hoped that she was making a difference in their lives.

Midwest

"I am so glad so many of you came! I am grateful that you came!" said Mrs. Smith, standing in front of 13 of her students. The students could smell the aroma of waffles cooking. She continued, "Let's begin by having a prayer on our breakfast and then we can eat. Make sure you are sitting next to someone who doesn't live in your area so you can get to know one another better." Students got their waffles, sat down, and began eating. Most talked quietly about high school life.

James, a 16-year-old red headed boy, sat down next to a blonde girl that he had known only from her picture on her profile on the course site. James liked these activities that the class did together. Meeting with the people was much more fun than sitting at home on the computer.

"You must be Megan, right?" James mustered.

A little taken aback, Megan's cheeks turned red and she said, "Um…yes. What was your name again?" James, looking a little dejected, told Megan his name. "Oh yeah, I have seen your name on the site in some of the forums; why haven't you uploaded a picture of yourself to the site?" Megan asked.

Slightly embarrassed, James said, "Um…I just never got around to it." Megan contemplated moving to another place to sit, but James quickly questioned, "So what do you think of this class?" Megan took a bite of waffle and swallowed.

"Well, at first I dreaded getting online and doing the work. The lessons just took so long and it was hard to get into the habit of doing it every day."

"I know what you mean!" James said. "If my Mom didn't tie me down to the computer each day, I would be way behind." James continued, "Once I got used to having the class once a week I have liked getting online and doing the work. I mean, once I got to know everybody by hearing their voices in our real-time class, I haven't dreaded getting online as much."

Megan said, "Me, too. I hated waking up Thursday mornings for class, but once I woke up, the classes were good. Mrs. Smith does a good job. It's different seeing Mrs. Smith's computer and hearing everyone by phone, but I am getting used to it."

James went to say something else, but Mrs. Smith stood up and said, "Okay, as you finish your breakfast let's start on this side of the room and each of you stand up and say your name and what city you live in and one thing unique about you." Each student stood up and took turns introducing themselves.

"Great," Mrs. Smith said, "we will do some more 'get-to-know you' activities in the lesson but first I want to take care of some class business." Mrs. Smith went on to explain to the students about how she took attendance in their online class. "Okay, for the four days you are

supposed to do your lessons online; if you logged in that day and completed the assignment you get full credit for that day, but if you don't you won't get marked present."

James looked at Megan and mouthed, "That happens to me all the time!"

"That brings me to the next subject." Mrs. Smith continued, "You know the forums that you have as part of your assignments for the week?" The students all nodded in acknowledgement. "You are not supposed to make just your own comment and go on to the next assignment. You are supposed to make your comment and then comment on others' posts. To help you do this, I have a paper for you. On it you will find your name next to the names of three other students." Mrs. Smith handed each student a paper. Mrs. Smith went on, "I am asking that each of you respond to three other students' forum posts for the next two weeks. That means, each day go through and find the three people that are assigned to you and respond to them with a positive comment and maybe a question that will make them think a little deeper."

James turned to Megan and said, "That will take forever! I never go back and look at those things!"

Mrs. Smith announced, "For the last item of business, please know that Facebook is very distracting to when you are trying to study the scriptures! Please try to not have both going at the same time. Please keep logging in each day. Remember we need to learn from one another online, as well. You all inspire me!"

Thematic Discussion

This thematic discussion will highlight how the teachers personalized their courses through the interactions they orchestrated with the available content and their students. Both teachers positively influenced the lives of their students. However, the resulting difference in teaching presence had a significant impact on students' experience in the course. First, the

section discusses the influence of teacher presence on cognitive presence. In the COI framework, cognitive presence is when learners are able to construct and confirm meaning through sustained reflection and discourse. To the extent possible this section describes what role the teacher played, beyond the selection and design of content, to help students construct meaning through sustained communication. It was not intent of this article to look at the depth of the critical thinking process of individual students, but what the teacher did to promote the meaning-making process individually and as a class. Second, the impact that the class size and structure had is described. Third, the role that the teachers played in influencing learners to interact with one another is discussed.

Teacher's Influence on Cognitive Presence

Beyond the selection and design of content, the narratives highlight how both teachers had a considerable influence on the frequency and quality of students' mental and social asynchronous engagement with content. Both teachers played the role of facilitator providing the supportive feedback with the students by helping them to think deeply about and complete their online work (Garrison, Anderson, & Archer, 2001) The LMS's ability to track time spent and tasks completed online allowed teachers to track each student's up-to-the-minute progress. Not only could they see if the students were completing the assignments, they could give individualized feedback and send messages to facilitate and support them on the online aspects of the course. James commented, "She [the teacher] knew when I would get online. If I didn't do yesterday's work I knew that I would have an email from her." Christine commented, "It's not just like we're talking to a wall. It's like there's someone there that's listening to us and has feedback on what we're saying." This type of dialog between teacher and students is example of sustained communication that promotes the learners to engage with the course work and think

carefully about the content presented. The efforts towards supporting and facilitating the students to complete their work online seemed paramount. Initially, students didn't appreciate or enjoy the things learned through the online content; however, once they formed the habit of doing their work daily, most began to identify the value of completing the online work. Of the six students (three from each class) in this study, four reported that most of their learning gains over the year came from doing the online tasks. Once sufficient time had been spent doing the work, the students began to value online interactions even though they didn't view them as the easiest or most enjoyable way to learn. This insight highlights the need for teachers to set expectations and provide up-to-date, consistent support, given the learner's self-efficacy and self-regulation skills (Rice, 2006). Students needed constant and consistent support to form those study skills. It seemed that when the teachers developed an interpersonal relationship with the students, becoming more than just a facilitator, the students were more willing to complete their online work. From observing both cases, because of the strong rapport and relationship the teachers created with the students, they were more willing to do the work assigned. Jacob, one of Mrs. Jones students often said that he did his work because he didn't want to let her down.

Impact of Class Structure on Teacher Presence

The number of students in each class influenced how much and how often teachers provided feedback on the tasks the students completed online. Because she did not have as large of a class (nine students) or a need to prepare a weekly lesson, Mrs. Jones spent more time giving feedback in the online environment than Mrs. Smith. One example of the two teachers' differences in approach was in how they used the LMS's messaging system. Mrs. Jones spent up to two hours a day carefully crafting individual messages to students to help them keep current on their work. Because of her consistent effort in reviewing their work and providing feedback,

she learned to sense how the students were doing in their lives. “I think that is what you have to do, you need to read carefully to pick up on any little thing that they say. You can tell if they are understanding.” In contrast, Mrs. Smith used the messages to provide information for the weekly classes and encourage students to interact with one another online. Mrs. Smith realized that it was not feasible to provide sufficient one-on-one support because of the size of her class (25 students). She decided that student interaction and learning from one another should be a major source of support and motivation. The structure of the weekly class in the two cases influenced how the classes interacted around the content and ultimately with one another.

Mrs. Smith had a weekly synchronous class via technology while Mrs. Jones’ students met individually or in groups of two with a parent for their weekly class. This structural difference had several implications. Because they met weekly in a synchronous setting, Mrs. Smith was able to discuss in a live setting what was covered in the asynchronous material for that week and could clarify or add to what was learned. Students valued the chance to interact around content in a live setting to get immediate feedback, something they didn’t experience online. Jackson commented that the synchronous virtual classes were of most value to him:

> I think that the lessons with Mrs. Smith helped the most because when I am reading something by myself and I don’t understand it … it won’t mean much to me… but when we are online talking with Mrs. Smith, I almost understand exactly what is going on, so I usually get the most out of that. The real-time classes made it easy to get a response back quickly; otherwise [online] you have to wait till she gets to it.

Mrs. Smith was able to direct student discussions around content, something that did not take place in the Northern Plains class. Mrs. Jones never had the opportunity to review what was learned during the four days of instruction together as a class, and she missed out on

opportunities to guide and direct instruction in ways that Mrs. Smith could. Because of her class structure, Mrs. Jones felt isolated. She stated, "the one thing about this program, you really can go along and have no interaction and really feel alone and so it becomes very monotonous."

Teacher's Influence on Social Presence

Because of the difference in class structure discussed above, there was a difference in the opportunities for students to interact with one another. Both classes had the same possibilities for asynchronous student-to-student interaction. However, having access to such interaction didn't mean that it occurred. In fact, both teachers found generating and maintaining student-to-student interaction difficult.

Some barriers to student-to-student interaction in both classes were noticed. First, in both classes the students would interact with one another online if they knew one another offline. The students in both classes used the messaging tool with people they had met personally. Perhaps due to their weekly interactions, students the Midwest students were interacting more towards the end of the school year with those they had come to know throughout the year. This was not the case for the Northern Plains class. The chance to meet weekly as a class in a live environment for the Midwest class made class facilitation more successful.

One aspect of student interaction that students from both classes felt was worthwhile had to do with the online forums. The students reported that while they might not comment on discussion forums, they still felt they learned from other students' comments. For example, Christine, a Northern Plains student, said,

> I can look at other people's answers and see what other people think so I can get to know the other people in my class a little better. I can say what I think but also hear what other people think and learn from them also.

Students taught one another through sharing their insights. This type of interaction has been termed *vicarious interaction* by Sutton (2001). This vicarious interaction is based on the principle that enhanced achievement may occur even when all students do not interact directly (Sutton, 2001). This illustration supports Sutton's (2001) claim that those not directly involved can learn from observing the direct interaction. Initially, both teachers tried to support this type of discourse. However, Mrs. Jones chose to stop trying to foster learner-learner interaction. Although she acknowledged the role that student-to-student interaction could play, trying to get the students to interact was extremely difficult in a solely asynchronous environment. She ultimately decided she could do more to help the students though developing her one-on-one relationship. In contrast, Mrs. Smith continually tried to support student-to-student interaction. She made it a part of the students' responsibility to comment on others' work. While these assignments produced only temporary engagement, students in Mrs. Smith's class became more willing to interact online little by little, leading to a more open and unified class.

As mentioned in the Midwest narrative, Mrs. Smith realized she couldn't interact meaningfully and efficiently with all of her students because of her class size. Besides assigning students to comment in forums, there were other things she did to try to promote student-to-student interaction. Using the LMS, Mrs. Smith created forums that allowed students to discuss teenage topics (e.g., a favorite movie quote, favorite band, and favorite snack). As detailed in the narrative, she also organized face-to-face activities to help them get to know one another in hopes that knowing one another would help them interact online. These chances to get to know one another offline and interact about everyday topics online helped the students get into the practice of interacting with one another online asynchronously. Without the deliberate decisions that Mrs. Smith made to promote a social learning environment, it would be difficult to expect

students of this age to create an online social atmosphere for educational purposes. In this case, the teacher's intervention was strategically structured to encourage an effective online learning environment. Additionally, Mrs. Smith did not expect students of this age to interact socially based on their motivation to study a particular subject. Rather, she shouldered the burden of creating relevant reasons for students to interact with one another socially, which fostered interaction around course content.

A forum activity that was part of the online instructional tasks the students completed towards the end of the year provides evidence of the impact that the teacher plays on social presence in interacting with other learners. This forum instructed students to discuss rules for an upcoming youth dance. Both teachers encouraged students to participate in the weeklong forum and present their ideas online. The Northern Plains class had a single comment made to the forum by one student. The Midwest class had 45 comments made by 11 different students throughout the week. While difficult to get asynchronous interactions started, once Mrs. Smith's students understood and felt comfortable interacting with one another, it created some momentum that served as an additional level of support and motivation towards a meaningful learning experience.

Limitations

The first limitation of this study was that this was a qualitative study from one distance religious education context, The results are not generalizable beyond this unique setting and group. Many other study topics need to be qualitatively studied; subject content and context often influence the communication and support in a course. Second, this was a qualitative study carried out in a distance-learning environment and much of the qualitative inquiry was done at a distance, because of this their full disclosure could be incomplete. As a result the study might not

have fully understood each of the individual cases. The four standards outlined by Lincoln and Guba (1985) and Guba and Lincoln (1989) for naturalistic inquiry were used to verify credibility, transferability, dependability, and confirmability of the inquiry. Third, this article did not assess or describe the depth of critical-thinking, dialogue, or content mastery of the students. However, this research tried to understand the impact that teacher presence had on helping the students to have sustained interaction with the content both mentally (helping them complete and think more deeply their work) and socially (helping them interact and think critically about the content in live settings). Fourth, the principal researcher is employed by the educational entity studied in the research. This relationship may have influenced the personal proclivities of the researcher. Acknowledging this, member checks and peer debriefing were used to the extent possible to overcome this limitation. Fifth, the age of the students, their maturity, experience, and ability to communicate are more limited than older subjects who are typically participants in interaction research.

Conclusions

This qualitative study provides insight into what role teacher presence might play on the other elements of interaction in Garrison's COI framework. Beyond the design and sequencing of content, the teachers one-on-one relationship and effort in reviewing the students work online influenced how actively students engaged cognitively with content. The ability to track and provide one-on-one feedback and support proved essential given the self-efficacy and study skills of the K-12 students. Forming a meaningful one-on-one relationship with the students motivated students to complete course work. Since much of the independent study work of distance courses is done at home, researchers could look at how instructors can effectively communicate with parents as an additional layer of support and help. While students need

constant contact and support to help them complete their independent study work, teachers need to understand which types of interactions are most helpful for the students.

The experiences highlighted in this study help identify the importance for those designing these types of environments to identify if the social and learning benefits afforded by social interaction are an essential and important part of their learning outcomes. If so, the teacher plays an important role in providing the educational and social climate needed to foster such interaction. Giving students the opportunity to interact in a live setting in this study appeared to foster the relationships needed to help them interact online. In this study students received credit for completing instructional tasks and not for interacting. Giving the students opportunities to interact asynchronously about interesting or relevant topics not related to content appeared to give them practice at interacting in an online environment. From this study, once students were experienced in interacting for an educational purpose online they seem to be more willing to interact cognitively around content. If interaction is key to the learning outcomes of the course, these interactions need to be designed in such a way that they are meaningful and rewarding for the students.

More research is needed in K-12 contexts to highlight the similarities and differences in how the COI framework is used in K-12 versus higher education contexts. The impact that teacher presence had on how much or how often students engage with one another or content was significant in the study. This study demonstrated that students could interact with content and one another without a teacher actively involved in a course. However, working alone might result in a less meaningful learning experience. As the distance education field grows, administrators may worry more and more about scalability and growth rather than the human interactions needed for meaningful and educational worthwhile learning outcomes (Anderson,

Rourke, Garrison, & Archer, 2001). While online courses will continue to reach increasing numbers of students, the one-on-one warm human relationship between teacher and student should remain paramount in designing distance learning contexts. The role of teacher presence on the other elements of Garrison's (2007) framework needs to be understood qualitatively in many other K-12 contexts because the level of support and dialog for a K-12 learner will be different than those in higher education settings. This study provides an in-depth look into one educational context and describes how influential a teacher's choices can be in facilitating, supporting, and orchestrating social and cognitive interactions towards meaningful learning.

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APPENDIX A: REVIEW OF LITERATURE

The purpose of this study was to discover, describe, and gain a deeper understanding of the nature of interaction in a distance/blended learning K-12 context. The purpose of the literature review is to lay the background for the research. First, the importance of interaction in education, especially in the context of distance education, will be explained. Second, the major theoretical frameworks that have been developed to research, analyze, and design studies of distance learning interactions will be discussed. Third, research about learning interaction in the distance education context will be presented, focusing on what still needs to be learned qualitatively about interactions. Fourth, the interaction research in the K-12 context will be explored, showing that thus far the research is insufficient in describing the nature of interaction and needs further development.

Importance of Human Interaction in Education

At the heart of this research was an attempt to understand the nature and experience of participants based on the interactions they had in four different home-study groups. At the outset of this review it is imperative to understand what is meant by interaction and why it is so important in any educational endeavor. Rooted in communications theory, the term *interaction* in educational literature has had many names, each relating to different aspects of interaction (Stanford & Roark, 1974). The terms commonly used to describe different aspects of interactions are discourse, dialogue, support, structure, collaboration, clarification, transaction, conversation, communication, feedback, guidance, clarification, and negotiation (Holmberg, 1999c; Moore, 1989, 1993; Northrup, 2002; Scardamalia & Bereiter, 1994; Sharan, 1990). All of these words describe some aspect of instructional interplay that tries to increase student knowledge.

The importance of understanding these interactions and what might increase effectiveness of such interactions in education is paramount for meaningful learning (Picciano, 2002). Moore considers interaction the defining characteristic in educational endeavors (Moore, 1989). Interaction in education involves not only the transmission of content but also an information exchange between two or more persons in which one instructs and the other learns(Hillman et al., 1994).

In face-to-face educational settings the teacher must orchestrate and make decisions for these interactions in the classroom. The flow of interaction in the face-to-face setting allows instructors to understand where the students are through this orchestrated process. Instructors gather information from the students with regard to their attitudes, difficulties, and their progress in real-time, thus allowing for adjustment and support (Hirumi, 2002). Good instruction is often characterized by the ability of the teacher to facilitate and support meaningful interaction by providing adequate, responsive support through the educational experience (Kelsey & D'souza, 2004). The 2009 Educause Center for Applied Research (ECAR) report *indicates* that students want to see a balance of instructional technology with the "human touch" in their academic encounters (S. D. Smith et al., 2009, p. 23). The report continues, "Students wrote explicitly about a preference for 'real books and people' and said that 'shiny new tech is still no substitute for well-trained, passionate instructors'" (S. D. Smith et al., 2009, p. 23). These sentiments indicate that human interaction is a critical factor in meaningful educational experiences, no matter the mode of delivery.

However, when teachers in non-traditional classroom (specifically when at a distance) want to facilitate and foster interaction, they encounter problems because of the space that exists between them and the learners (Sabry & Baldwin, 2003; Zheng & Smaldino, 2009). Blended and

distance education environments often lack the immediacy and richness or high fidelity of interactions (Graham, 2006). Blended learning environments seek to enhance computer-mediated methods of instruction with the benefits of human interaction. The student's experience in Midwest case demonstrated that teachers need to plan online experiences and activities that will provide interactions as rich as those that can happen in a face-to-face environment and assist the students to feel connected to the learning experience (Hirumi, 2002). Teachers need to overcome the space, geographical, temporal, or psychological, between them and their students (Garrison, 1990). Although the challenges of maintaining meaningful learning relationships at a distance exist, the possibility for learners to interact with their teacher and other learners at a distance has never been more promising because of technological advances. Several major theoretical frameworks in the field of distance education have been developed to analyze and study the human interaction aspect of learning at a distance. The next section describes several major theoretical frameworks and outlines the research on different types of interaction.

Theoretical Framework

For one to understand what type of learning is taking place one must be able to identify, describe, and assess the type and nature of the learning interaction and how connected or distant the students and teachers feel as a result of such interactions. Moore (1989) was the first in the distance education field to develop a theory and framework to analyze distance learning interactions. His work has been seminal in distance learning research. Moore identified three primary types of learning interactions: learner-content, learner-instructor, and learner-learner (Moore, 1989).

Learner-content (L-C) interaction occurs when students engage and interact with course materials. Proponents of learner-content interaction propose that course content can be written in

such a manner that a learner could interact through this *guided didactic conversation* with the course content (Holmberg, 1999c). In other words, through this conversation students would be able to engage more mentally in order to understand the words on the page.

Learner-instructor (L-I), as defined by Moore (1989), includes the role that a teacher plays to counsel and encourage each learner. Specifically, teachers should create interest, foster motivation, and organize the material in such a way that students can learn.

Learner-learner (L-L) interaction occurs when students communicate and work with other learners on academic tasks as well as interact socially with other learners. This level of connectedness (or separation) is what Moore's theory of distance interaction has attempted to study. Investigating these types of interaction has directed much of the research in the field of distance education.

Advances in technology, specifically the Internet and communication technologies, coupled with the expansion of the social view of learning have generated a major shift in pedagogy in distance education. Such technologies have allowed the channels of communication to open and enabled students to communicate with the teacher and other learners both asynchronously (e-mail) and synchronously (web-based audio- and video-conferencing). Hence, more learner-teacher and learner-learner interaction can take place. The growth in technology-mediated means for interaction in education has brought additional distinctions of interaction that have been defined and discussed in the distance learning literature. First, Hillman, Willis, and Gunwardena (1994) identified a fourth distinction of interaction as learner-interface. Learner-interface interaction takes place when a student uses a computer to learn a particular topic. It involves the interplay between the design and function of computers and the user navigating the messaging and tasks the computer portrays. Hillman et. al insist that it is a viable distinction of

interaction because students must be able to use the programs before they can obtain content online.

A fifth type of learning interaction has been defined by Sutton (2001) as "vicarious interaction." He claims that students can learn vicariously through watching or observing others who are directly interacting. This vicarious interaction is based on the principle that enhanced achievement may occur even when all students do not interact directly (Sutton, 2001). For example, when a teacher and a student have a conversation in class, the others in the class are not directly interacting but are vicariously interacting in that they observe the exchange. Sutton (2001) claims that those not directly involved can learn from observing the direct interaction.

Several other types or distinctions within distance learning interactions have been advanced. Anderson and Garrison (1998) acknowledged Moore's types of interaction and added three other distinctions of interaction in a distance/blended research context: teacher-content interaction, teacher-teacher interaction, and content-content interaction (Anderson & Garrison, 1998). Teacher-content interaction occurs when a teacher is involved in the process of developing learning objects. The interaction takes place when the teacher interacts with the subject matter (content) and the instructional design process to produce an object or lesson to teach. Anderson (2003) later explained that the decisions made by the designer/teacher in this phase are critical to "maximize the attainment of legitimate objectives and support", insuring that the modes of interaction that are included in the design are aligned with those objectives (Anderson, 2003, p. 143). Teacher-teacher interaction happens when teachers interact with one another to give assistance and feedback toward their educational goals. Anderson and Garrison (1998) specifically noted that teacher-teacher interaction is extremely influential on the professional development of the teacher and that technology can provide for enhanced

collaboration between educators, more than ever before. Lastly, content-content interaction involves the interaction of inanimate objects (computer and networks) for the purpose of searching and retrieving information from educational products and websites that could be gathered and organized for the creation of future learning objects. Metadata are gathered from the web and can be aggregated to repurpose, recreate, and reproduce learning objects (for the creation of content) (Anderson & Garrison, 1998)

All eight of the distinctions of interaction described above involve different levels of human interaction as well inanimate object interaction (workbook and metadata for example) for the purpose of learning. This research at hand sought to describe just the human aspects of interaction in both the traditional and technology-mediated models of home-study.

Another prominent distance design and research framework is Garrison's *Community of Inquiry* (COI). The COI framework categorizes the learning interactions into three interdependent elements: social, cognitive, and teacher presence (Garrison & Archer, 2007). Social presence is characterized by ability of participants to communicate purposefully in a trusting environment, and develop inter-personal relationships (Anderson, Rourke, Garrison, & Archer, 2001b). Teacher presence entails the design, facilitation, and direction of cognitive and social processes. Cognitive presence consists of when learners are able to construct and confirm meaning through sustained reflection and discourse (Garrison et al., 2001a).

Another framework that has evolved to study learning experiences specific to distance education concerns itself with the degree to which a student feels separated from the teacher. People new to distance education often think of "distance" as the separation in terms of time and space. However, Moore (1993) identified two additional types of separation that can exist: the psychological and communications separation between the teacher and learner. In the field of

distance education, this psychological and communication separation has been labeled the theory of transactional distance (Moore, 1993). The term *transaction* is similar to the idea of interaction as mentioned above. Transaction here connotes the "interplay among the environment, the individuals, and the patterns of behavior in a situation" (Moore, 1993, p. 143). The psychological and communications space between a learner and teacher never remains exactly the same. These spaces are influenced by three factors. First, the structure and flexibility of the course and content. In other words how much flexibility does the learner have? Does the learner have the freedom and capacity to modify any aspect of the course? Second, what types of dialogue does the course potentially have, i.e., specifically how easy is the flow of communication, given the content and medium with which the course is delivered? Third, what level of autonomy does the learner possess or desire to have? In other words, how much freedom is the learner granted and what levels of support are built into the course? Interactions between students and content, teachers, and other learners all influence this level of separation felt. This research used Moore's three types of interaction as the major framework for this study. The researcher acknowledges the other distinctions of interaction as well as Moore's transactional distance theory, and will be mindful of how these additions and clarifications might influence the nature of interaction throughout the study.

Within each of these types of learning interaction there are varying levels of richness of human interaction. Face-to-face communication is the richest form of interaction; no technology is needed. However, in distance and blended learning, many technologies have been and are being produced to attain a level of richness equal to that of a face-to-face experience (Muilenburg & Berge, 2001). As technology has advanced, instructional designers and teachers have tried to leverage technologies, such as telephone and video-conferencing and electronic

messaging, such as email, discussion boards, and online forums. All of these have been developed to increase the human interaction aspect of distance learning (Spitzer, 1998). These technological innovations have allowed information to be disseminated at different speeds and time. The capacity for the information to change a student's understanding within a certain interval of time is defined as information richness (Ngwenyama & A. S. Lee, 1997). The reason for wanting richness similar to that found in a face-to-face situation is because more can be shared, debated, processed, changed, and verified in a short amount of time. Within the blended learning literature this level of richness is known as "fidelity." While having an increased level of richness or fidelity might be helpful for some types of interaction, it may not be needed for other instructional tasks. For example, at times content does not need to be delivered in a high fidelity manner, for example through video conferencing, it may be delivered as text or audio recording. However, if an instructional task requires a constant flow of information back and forth between learners and the teacher, a technology that allows for a higher fidelity discussion might be warranted. Hence, teachers and instructional designers are left trying to find the right balance among the kinds of interaction, along with the varying technologies, each allowing for different levels of fidelity. Of this quandary Anderson said,

> Too much of our practice in distance education is not "evidence based" and our actions and instructional designs are often grounded on untested assumptions about the value of modes of interaction (or lack thereof). Thus, research opportunities that focus on interaction in all forms are boundless, yet critical. (Anderson, 2003, p. 141)

Since the research opportunities are boundless and critical, the next section will address some of the research has been completed in the distance education context on interaction. It will discuss

what has been learned about Moore's three types of interaction as well as what remains unclear in regards to interaction.

Research of Learning Interactions at a Distance

Distance education theorists and researchers have examined the pedagogical, motivational, and economic costs and benefits of interaction (Anderson, 2003; Anderson & Garrison, 1995; Garrison, 1991; Harasim, 1990; Henri & Rigault, 1996; Holmberg, 1985; Katz, 2000; Moore & Kearsley, 1996; Saba & Shearer, 1994; Soo & Bonk, 1998; Winn, 1999). Studies have concluded that when there is a richer level of human interaction in learner-instructor and learner-learner interactions in distance education, there is an increase in motivation and persistence to complete course work, more positive attitudes towards learning, and deeper, more meaningful learning (Garrison, 1990b; Scardamalia & Bereiter, 1994; Schrire, 2006) Other studies have also suggested that the greater the interactivity in an online distance course, the lower the dropout rate (Fredericksen et al., 2000; J. Lee et al., 2006). In sum, the field has accepted interaction as an essential aspect of meaningful learning experiences (Berge, 1999; C. Gunawardena, 1999; Zheng & Smaldino, 2009).

Research has also looked specifically at each of Moore's three types of interactions individually. The following section will provide examples of research that has been completed on each of Moore's types of interaction.

Learner-content. Proponents of learner-content interaction maintain that if the content is developed is an effective manner a student can mentally interact in meaningful ways with the content (Holmberg, 1999a). Researchers have classified different ways content can be formatted for delivery to students for interaction. Tuovinen (2000) identified five basic categories: sound, text, graphic, video, and virtual reality. He argued that certain combinations of media are processed by different parts of the brain and certain combinations are more prone than others to

cause cognitive overload. He also found that if students participate in the creation of multimedia content their learning increases through using the strategies and skills needed to organize and produce the content (Tuovinen, 2000).

Another study examined the experiences of learners who prefer solitary learning (i.e., learner-content) but are in a collaborative learning environment (learner-learner). Ke and Carr-Chellman (2006) qualitatively looked at how five "solitary learners" felt about being in a collaborative learning environment. Through qualitative interviews theyey found that the participants had a preference for internal interaction for learning, but were willing to engage in collaboration—but not in an interdependent way, relying on one another to complete their work. They also found that these learners preferred to interact academically rather than socially (Ke & Carr-Chellman, 2006).

Learner-instructor. The importance of learner-instructor interaction is relevant not only in the distance education context but also in the traditional classroom. In the traditional setting, Wlodkowski (1985) found that learner-instructor interaction played a significant role in relation to student motivation (Wlodkowski, 1985). Other studies found that feedback provided in learner-interaction was a key element for student satisfaction (Laurillard, 2002). In a distance setting, studies of audio and video-conferencing showed that effective learner-instructor interactions can take place as well as in a text-based medium (Garrison et al., 2001a; Hearnshaw, 2000; Katz, 2000; Parker & Olgren, 1980).

Learner-learner. Proponents of increasing learner-learner interaction believe that through these socially connective technologies, effective learning relationships (where students interact and work together to form their own understanding) mirror face-to-face learning that occurs naturally among groups, teams, or other social instances (Garrison & Baynton, 1987)

Damon (1984) noted that "intellectual accomplishments flourish best under conditions of highly motivated discovery, the free exchange of ideas and the reciprocal feedback between mutually respected individuals" (Damon, p. 340). Anderson (2003) stated, "The most social component of the distance education process is what allows distance education to move beyond independent study." (p. 134) In other words, because of technology doors have been opened for learner-learner collaborative learning that was not available for many years (Anderson, 2003)

Comparing Moore's Three Types of Interaction

While much of the research suggests that specifically learner-learner interaction has a more positive influence on learner persistence and completion than other types of interaction; some studies in learning interactions have suggested that learner-content and learner-instructor could be just as important depending on the context and needs of the students (Glaser, 1990; Hannon & Atkins, 2002). Many studies have compared the three types of interactions, several are discussed next.

Sabry and Baldwin (2003) sought to understand the correlation between learning styles and learners' overall perceptions of the types of learning interaction they had. Using a survey research design with a group of undergraduate and graduate students in the United Kingdom, they concluded that students most favored learner-content interaction (called learner-information in their study), with learner-instructor second and learner-learner third. In their view, the types of interactions weren't discernable to the students. In other words, in the students minds they didn't seem draw any distinctions among the three types of interactions. The authors also noted that there seemed to be a disparity between what the participants perceived as useful and the actual frequency of the interactions with the content, instructor, or other learners they had (Sabry & Baldwin, 2003). These findings raise several questions that might be answered through a more

qualitative in-depth investigation regarding the interaction that they experienced (Bianco & Carr, 2002). Other researchers have also identified learner-content as the most important learning interaction (Reisetter & Boris, 2004).

Although learner-content interaction was found in the studies noted above to be the most valuable type of learning interaction, other research identified learner-instructor interaction as the most useful or important type of interaction. One such study by Kelsey and D'Souza (2004) sought to understand which interaction was the most important to the learners in a distance learning situation. They interviewed teachers and students who participated in a graduate level course with regards to learning interaction preferences. Their findings suggested that the students most valued the interaction they had with the teachers. The students felt that the technology allowed them the opportunity to engage with class materials sufficiently. They expressed that having meaningful contact with the teacher provided the support they needed to participate meaningfully in class. The students indicated that learner-learner interaction was less important for the completion of their learning experience. However, the teachers indicated that the course was not designed to take advantage of learner-learner interaction because of the lack of and the troubles previously experienced with technology ((Kelsey & D'souza, 2004).

Nevertheless, even with the findings that cite the importance of learner-content and learner-instructor interaction, many researchers still insist that the learner-learner interaction is the most important type interaction in distance education (Muirhead, 2000; Weiner, 2003). These opinions seem to be based on the pedagogical notion of social learning, that through creation of learning communities learners will be more satisfied with their distance learning experience and have more meaningful learning because they feel connected within a learning community (Barbour et al., 2008; Weiner, 2003). Sharp and Huett (2006) state that

> Given the extensive research on the benefits of collaborative learning, one can arrive at a working assumption that a greater sense of community will increase motivation, participation, understanding and satisfaction. So it follows that if students surveyed about interaction types were actually involved in classes with strong learning communities, they would most likely rate this type of interaction as very important. One is given no clear indication from studies [like mentioned above] that learning communities were ever established. (p. 7)

Yet, some distance educators have wondered whether collaborative learning is a forced or contrived process in distance education since learner flexibility and autonomy remain among the top reasons student choose to participate in distance education. Additionally, learner-learner collaboration has been extensively researched, designed, and practiced in face-to-face classrooms (Navarro & Shoemaker, 2000). As Ke and Chellman (2006) found, certain learning styles like a solitary-learner do not want to be involved in the learner-learner collaboration, opting for the learner-content interactions. Sharp and Huett (2006) comment on the role of learning communities and their perceived or actual importance in distance education.

> Does the extensive research on the value of learning communities in traditional classroom settings mean that they are a necessary component of online learning? There is simply not enough research to answer what type of interaction distance learners prefer or should be expected to engage in. It seems plausible, given the lack of collaborative learning in K-12 environments that our educational system is producing learners who prefer to interact with the content and/or the instructor but not each other. It seems equally plausible that the type of learner who typically engages in distance education courses (adult, independent learners with higher internal loci of control) have significantly different

> goals and preferences when it comes to online learning that may not lend themselves well to learning communities. (p. 7)

So while learner-learner interaction is important and learning communities can have a positive influence on learner satisfaction and motivation, many questions are still unanswered. Possibly, given the extensive research that has been done on the topic, the process of validating the efficacy of the three different types of learning interaction is not as developed as one might think. Various conclusions of the research cited may relate to many factors, including the learner, the context, and the instructional goals. Other reasons as to why the findings have been inconclusive related to Moore's types of interactions are further developed below.

There may be several primary reasons for the lack of clarity of findings from the previous research. First, much of the interaction research has compared traditional face-to-face classes to distance education classes. This comparison of interactions might not be descriptive enough given the unique nature of the interactions (Jung, Choi, Lim, & Leem, 2002). In fact, Bernard et. al (2004) called these kind of research comparisons of face-to-face to distance education the "new no significant difference" findings in the realm of distance interaction research (Bernard et al., 2004; Russell, 1999). Meyer (2004) commented on the problematic nature of comparison studies and stated that much of the research did not control for many important variables such as student learning styles and maturity. In other words, comparison studies involved too many variables to effectively understand the nature of interactions in such studies (Meyer, 2004).

Second, Garrison and Cleveland-Innes (2005) noted that the methods, such as survey research, used to understand the interactions seemed to give us only part of the picture. They suggested,

> That simple interaction, absent of structure and leadership is not enough. We need to have a qualitatively richer view of interaction. There is a strong need to study the qualitative nature of online interaction in terms of teaching and learning approaches… Further study is very much needed to understand the nature of online interaction that will support higher levels of learning. (Garrison & Cleveland-Innes, 2005, p. 143)

Others have proposed that qualitative research would provide a better understanding of interaction. Bianco and Carr-Chellman (2002) stated that "If learning is at the heart of your choices regarding instructional delivery options, researchers and educators are obligated to fully understand student experiences" (p. 252). They go on to explain that survey research on perceptions of technology-mediated are helpful, but that "no matter how popular, convenient, or well-funded online learning options may be, their impact on learners' experiences as understood through qualitative inquiry should be carefully considered by all practicing instructional designers" (Bianco & Carr, 2002, p. 252).

Another point to consider is that given that the context of the current research is grades 9-12, what research has been completed on learning interactions in the K-12 context? What differences are needed in the design and methods of learning interactions for the learning differences like the level of support and autonomy needed the K-12 learner?

K-12 Research in Distance Learning Interaction

As in the literature of adult distance education interaction, much of the body of K-12 literature attempts to compare face-to-face with distance environments(Cavanaugh et al., 2004; Mupinga, 2005). Rice (2006), in a literature review of the K-12 context, supported the position to move beyond comparison research and stated that research should focus on different modes of

distance delivery and factors that ensure successful teaching and learning (Rice, 2006; Sharp & Huett, 2006)

The bulk of distance interaction research has been completed with students in higher education (O Dwyer et al., 2007). Higher-education research has informed and influenced those involved in the design and the administration of distance education programs in the K-12 environment. Cavanaugh, Kromrey, Hess, and Blomeyer (2004) warn against assuming that the research findings in higher education apply to the K-12 environment. They argue that the K-12 learner is fundamentally different from the adult higher education learner. The self-direction and autonomy needed in higher distance education cannot be expected from the younger learner. Designers of such courses need to allow for changes and adjustments in the learning interactions that provide more support than those in higher education (Sharp & Huett, 2006)

Qualitative Study of Learning Interactions in the K-12 Environment

Some qualitative research about learning interactions has been conducted with the K-12 setting. Most has been gathered by first-person practitioners through experiences, not based on deliberate specific research (Cavanaugh, 2007). Few studies have qualitatively researched the students' perceptions and opinions about their distance education experience (Barbour et al., 2008). At the close of his research Barbour stated that "This study represents another step in understanding student experiences in the virtual school environment, but clearly more research is needed" (p. 370). It was the intent of this research to provide a rich descriptive look at interactions in a K-12 distance/blended learning context. In answer to the call for a more in-depth understanding of interaction, this study sought to contribute and clarify to the existing body of literature by (1) qualitatively analyzing learning interactions (Garrison & Cleveland-Innes, 2005; Moore & Kearsley, 1996); (2) using two different delivery methods of blended/distance

education, moving away from the face-to-face vs. distance comparison (Bernard et al., 2004; Rice, 2006); and (3) specifically seeking to discover and document interaction for a K-12 context that can lead to greater understanding and more developed theories of interaction dealing with the unique aspects of the K-12 learner (Barbour et al., 2008; Cavanaugh et al., 2009; Weiner, 2003). The two articles produced from this research sought to accomplish these goals stated. Appendix B will provide a full description of the methods that were used in the study.

APPENDIX B: DESCRIPTION OF METHODS

In order to appropriately understand the context of the study, this chapter begins with a discussion of the seminary and institute programs, including a description of their objectives and formats, with an emphasis on the development of the home-study format. Second, the specifics about the two home-study models that are currently in use (the traditional and the technology-mediated) that are the focus of this study are described. Third, the theoretical framework and the rationale for the unit of analysis are presented. Fourth, the sampling procedures are outlined, with specific descriptions of the cases selected. Fifth, the different types of data that were gathered and the data analysis procedures are detailed. Lastly, the steps taken to assure the trustworthiness, credibility, and transferability, as well as the limitations, of the research are discussed.

Context

The Seminaries and Institutes of Religion (S&I) are under the direction of the Church Educational System of the Church of Jesus Christ of Latter-day Saints. The objective statement of S&I states that "Our purpose is to help the youth and young adults understand and rely on the teachings and atonement of Jesus Christ, qualify for the blessings of the temple, and prepare themselves, their families, and others for eternal life with their Father in Heaven" (Seminaries and Institutes of Religion, 2008). The primary means of attempting to accomplish this objective is through religious education courses. The seminary program delivers courses to students ages 14 to 18; institute courses are for young adults, generally ages 19 to 24. This study will focus solely on seminary-age students (14–18). The course material for the seminary program comes from the Church's "Standard Works," meaning the Old and New Testament of the Bible, the Book of Mormon, the Doctrine and Covenants, and the Pearl of Great Price.

Students can take seminary in three different formats. First, release-time seminary is offered in areas where there is a high concentration of members of the LDS church, mostly in Utah, Idaho, and several small geographic areas of other states. The release-time classes are part of the students' daily instruction at school; they attend seminary classes in seminary buildings adjacent to state-run high or junior high schools during a school period. Second, early-morning seminary classes are held in areas where students can meet daily before school classes begin. Third, home-study programs are offered to students who cannot feasibly meet daily because of geographical constraints. The students work independently four days a week and meet face-to-face with the other students and teacher one day a week. The present study deals solely with the home-study program in S&I because of its use of distance and technology-mediated delivery aspects of the course.

In the United States during the 2007-2008 school year, about 3,045 students (or 1.6% of the total U.S. seminary student population) used home-study as their means of attending seminary. Worldwide, during the same year, 30,024 students (or 8.3% of the total seminary student population worldwide) enrolled in home-study seminary. In the United States the percent of those who completed the course and received credit that year was 45.8% and worldwide the percent who completed the home home-study course was 44.4% (M. Turner, personal communication, September 23, 2009). Students received credit for seminary when they turned in 80% of the homework assignments and attended 80% of the weekly classes.

In order to appropriately understand the context of the study, it is important to understand the historical background of the S&I home-study program and its evolution to the current technology-mediated model.

Historical Information

The current home-study program of S&I has evolved from courses originally developed at Brigham Young University's Independent Study program. In 1954 the S&I administrators saw that an increasingly large audience of seminary students, both stateside and internationally, did not have the opportunity to have a seminary experience because the students and teachers lived too far apart to meet daily. They approached BYU Independent Study about the possibilities of using an independent study model to create such an experience. S&I adopted the independent study model of BYU Independent Study and developed the seminary curriculum. The home-study program of S&I focused on learner-content interaction maintaining the independent paper and pencil model.

In light of the educational pedagogical changes (from a predominantly behaviorist to a more constructivist view of learning) and the technological advances between 1954 and 2004, administrators of S&I began to consider what might be the role of technology in religious education. Specifically, within the home-study context they began to examine ways that technology might enhance the experience for both students and teachers. In 2004 several groups of home-study students and teachers were involved in a pilot project where students and teachers communicated via email about their assignments and progress. Teachers would email the students their assignments and encourage progress several times a week via email. These emails could at times include a spiritual thought or quote that the teachers would share with students. The advantage of more frequent contact with the teacher allowed the students to feel more connected. This email pilot project grew from year to year with more participants involved (T. J. Griffin, personal communication, August 26, 2009). In evaluating the pilot project, S&I researchers found that the additional contact slightly increased the likelihood of students

completing the course for credit, as well as increased overall satisfaction with their seminary experience (T. J. Griffin, personal communication, August 26, 2009). In 2008, after four years of using the listserv email program, administrators wanted to explore the possibilities of expanding the home-study program given the growth of Internet technologies.

In 2008, S&I selected Moodle as a course management system because its tools were versatile and friendly and the site was confidential (i.e., secure). In sum, it allowed for a variety of online learning delivery tools and options. Developers uploaded content from the student study guide already used in the traditional home-study classes onto the Moodle site, adding video clips they felt would add to the experience for the students online. Developers felt that the students would eagerly embrace the online medium because of the vast expansion of Internet use among youth ages 14–18. Thirty-three home-study groups began the 2008-2009 seminary year as participants of the new Moodle pilot project. Only twelve of the 33 groups continued to use the Moodle tool throughout the entire school year. No systematic research was completed with the pilot program, other than general completion statistics and firsthand observations. According to the online home-study administrator, the general reasons for the attrition in the numbers of participating groups related directly to the comfort level and experience that the teacher and students had with the technology involved in the online learning environment (T. J. Griffin, personal communication, August 26, 2009). As the developers worked with the teachers who used the tool in the 2008-2009 year, they revamped and redesigned their online model for the 2009-2010 school year. While many have been excited about the possibilities of such an online seminary experience, the decision to adopt and use the online program versus the traditional home-study model has been left to the discretion of the S&I local coordinators. The next two sections will provide more details of both modes of the home-study program.

Traditional Home-Study Model

In S&I the traditional home-study program provides a seminary experience for students who cannot meet on a daily basis (because of distance) with a teacher for a face-to-face class. During the week, the students work through a student study guide in conjunction with the scriptures to complete assignments that are then submitted to the teacher. This model asks that students complete four days of independent study, usually reading a couple of chapters of scripture and then completing assignments directly tied to those chapters. When the students meet for their weekly class, they turn in the previous week's assignments. To receive credit in this traditional model, students must complete 80% of the bookwork assignments and attend 80% of the face-to-face classes.

Online Home-Study Model

Students are expected to use the online site to complete daily work, usually spending 35 to 60 minutes daily depending on the students' abilities and the length of the online lesson. Students receive credit for completing the online seminary program by completing 80% of the assignments online as well as attending online or face-to-face classes each week. In total, 47 groups (including three international English-speaking groups) used the online home-study program for the 2009-2010 school year. The content of the online curriculum was designed to increase and take advantage of the learner-learner interaction tools within Moodle itself (e.g., forum, discussions boards, direct messaging, wikis). Each of these 47 groups has four lessons that are ready weekly for delivery online and a fifth class is held electronically via chat, message board, or audio-conferencing, or in a face-to-face situation, depending on the teacher's desires.

Participants

This section will contain brief general descriptions of the participants in both of the home-study models.

Teachers. The teachers involved in the home-study program are volunteer teachers. Usually, but not always, a teacher in the home-study program is a middle-aged member (usually female) of the Church of Jesus Christ of Latter-day Saints. They participate in the seminary program because they have been asked to by a local ecclesiastical leader. Their educational backgrounds vary, ranging from high school graduation to graduate college degrees. They have had varied religious experiences and backgrounds in relation to Church membership and service. The teachers are supervised by a local full-time S&I employee called a coordinator. The teachers are trained by these coordinators through teacher in-service meetings. Coordinators also work in conjunction with the teachers regarding administrative tasks such as student attendance, completion, and make-up work.

Students. The students who participate in the home-study program are home-study seminary students ages 14–18. They are high school students in grades 9–12 either attending a local high school or being home schooled in the equivalent grades. They are usually members of the Church of Jesus Christ of Latter-day Saints. They may have several motivations for taking seminary, ranging from a personal desire to study the scriptures to the insistence and expectation of their parents. The students have different levels of commitment to their religion and have varied scholastic abilities.

Coordinators. The S&I coordinators are full-time employees and are responsible for the seminary and institute classes in their assigned geographic area. They work in conjunction with the ecclesiastical leaders in the area to train, support, and assist the volunteer teachers who teach

either early-morning or home-study classes. The coordinators are the teachers' first contact for questions regarding teaching or credit issues.

Theoretical Framework for Data Collection and Analysis

This study used Moore's (1989) three types of interaction as the general theoretical framework. These include learner-content interaction (L-C), learner-instructor interaction (L-I), and learner-learner interaction (L-L)(Moore, 1989). While suggestions to expand the distance learning interaction framework to include learner-interface interaction (Hillman et al., 1994) vicarious interaction (Sutton, 2001) teacher-content interaction (Anderson & Garrison, 1998), and content-content and teacher-teacher content interaction (Anderson, 2003) were considered, this study focused on the three main fundamental interactions set forth by Moore. The justification for this determination was threefold. First, the other types of interaction proposed by Hillman et al. (2004) and Anderson (2003) deal more with the interactions that occur in the development and delivery of content and were viewed as L-C interaction from the outset of the study. Second, Sutton's (2001) vicarious interaction was viewed in this study as a product of both L-I and L-C interaction. Third, this is a qualitative case study that sought to understand students' and teachers' experiences, and thus, for a focused inquiry, only the three most prominent types of interaction from the literature were used to effectively align the research questions with the qualitative research methodology (Hall, 2003). While Moore's (1989) framework was used to guide data collection and provide a framework for research design and analysis, the analysis was open to other types of interactions depending on the words and opinions of the participants in order to capture in a descriptive manner the nature of interaction in this particular context. The next section will discuss the unit of analysis selected in this research.

Case Study

The purpose of this research was to discover, describe, and understand the nature of interaction experiences of students and teachers in the LDS home-study program. A qualitative case study approach was used in this study. A case study approach provides a "thick" description of the phenomenon understudy (Merriam, 1998). The importance of descriptive research is asserted by Gibbons and Bunderson (2005): "Before it is possible to create theories, we must have some description of the nature and the content to which theories pertain" ((Gibbons & Bunderson, 2005). A qualitative case study approach was used in order to "arrive at a comprehensive understanding of the groups under study" and "to develop general theoretical statements about regularities of groups under study" (Becker, 1968, p. 236).

The unit of analysis in this case study was a home-study group, consisting of a teacher and her students, the students' parents, and the S&I coordinator. Four cases were studied, two cases from the traditional home-study model and two from the technology-mediated model. According to Miles and Huberman (1994) as quoted in Merriam (1998), a case study approach is warranted when the case context qualifies as a "bounded" context (Merriam, 1998; Miles & Huberman, 1994). These cases met these requirements of being bounded in that there was a "limit to the number of people involved" (p. 28). In the online home-study program a limited number of students and teachers are piloting the technology-mediated model and will only be available for a "finite amount of time for observations" (p. 28); the school year lasts from August 2009 to June 2010. The rationale behind the selection of four cases was that a few specific cases were needed in order to get depth of understanding and not just an average opinion (Merriam, 1998). Having four different cases was still 'large' for a qualitative case study. However, the four cases—two from each model— provide for a more diverse, yet thick, description of teacher and student experiences in both of the delivery models. The choice to research two cases per model

was also made in order to provide a broader view of the possible interaction, given the different levels or structure or leadership provided by the teachers in each context (Garrison & Cleveland-Innes, 2005). Additionally, the principal researcher tried to carefully manage the sample size to allow for an in-depth discovery in each case. The details of the sampling procedures to identify the selected cases are discussed next.

Sampling

The sampling in the study was purposeful as described by Patton (1990) who states that "the logic behind sampling lies in selecting information-rich cases for study in depth. Information-rich cases are those from which one can learn a great deal about issues of central importance to the purpose of the research, thus the term purposeful sampling" (Patton, 1990, p. 169). The purposive sampling framework guided the selection of successful programs from both models. Using successful cases (based on student completion of approximately 70% in contrast to the norm of 45%) were more likely to manifest the phenomenon of successful interaction practices specific to each model. This method of sampling attempted to use Patton's (1990) "intensity sampling" (p. 234) and allowed for the chances of getting a greater intensity of effective interactions. Purposive sampling was also used to try to find homogeneity across groups within cases and to control variables such as socioeconomic factors that might influence the interactions.

The principal researcher worked in coordination with S&I area directors and coordinators to identify successful programs and teachers. Suggestions of such programs (based on criteria above) were given to the principal researcher. From the suggestions, the principal researcher identified a traditional and a technology-mediated group in a similar geographic location. The teachers of the programs were contacted by phone and were invited to participate. Additional

information about the research was emailed to them. It took three weeks to identify four teachers (two from each model) who met the purposive sampling choices outlined above and consented to participate.

Once the teachers were identified and consented to participate, further purposeful sampling was carefully completed to select students to participate. The principal researcher worked in conjunction with teachers to identify which students would provide information-rich accounts of the seminary experience. Teachers were asked to identify two boys and two girls (ranging from grades 9–12) who they felt would classify as a "typical" student and yet would probably complete the course. "Typical" was defined as students who illustrated or highlighted what was typical, normal, or average. The teacher's opinion concerning the likelihood of course completion was based on the teacher's previous interactions with the student (Patton, 1990). The purposeful sampling using "completion" as a guideline was chosen because an in-depth understanding of the interaction would be available only if the students actually participated over the course of the school year and completed the course for credit. Data from the four students from each site were collected, for a total of 16 students. The rationale behind gathering data from four students from each site was to build some redundancy in case of student drop out.

A case from each model was identified in similar geographic/socioeconomic areas. For the study they were named as follows: the traditional groups were the Northern Plains traditional and the Midwest traditional. The technology-mediated groups were called Northern Plains technology-mediated (T-M) and Midwest technology-mediated (T-M). Thirteen students and parents consented to participate in the research. Three from each of the technology-mediated groups and three and four respectively from the traditional groups agreed. One student from one of the traditional groups chose not to complete seminary for the year. It was anticipated that two

males and two females could be selected to participate. However, it was not possible to get two from each gender from each group because of the inherent size and makeup of the groups and with the one boy in the Midwest traditional not continuing to take seminary. Thus, the research group consisted of three boys and three girls or six students from each model (traditional or technology-mediated), with three in each case within each model.

The decision to have 12 students instead of 16 was two-fold. First, there wasn't a balance of males to female based on the enrollments in the classes. Second, after the initial visits the researcher decided to narrow and focus the descriptions because the amount of data to be gathered and analyzed was too great and would ultimately be detrimental to the scope of the study. Table 1 provides information on each of the four cases that were selected.

Beyond the participants outlined in the table above, the principal researcher gathered data from a parent of each of the students who participated in the study. It was planned to collect data from the S-I coordinators who supervised the four teachers, but the reason for not collecting these data is discussed in the interviews section. The next section discusses the data collection methods that were selected to understand and describe the student and teacher interactions.

Data Collection

This research used observations, interview, and document analysis as the sources of data. All data gathered were focused on and aligned to gain an in-depth look at interactions in terms of the research questions. Table 2 illustrates what data were collected and how the data collected aligned with the specific research questions. Table 3 details the procedures and timing that the data were collected. Each type of data are described and discussed in the sections following tables 2 and 3.

Table 1 *Description of Selected Cases*

Northern Plains Traditional				Northern Plains Technology-mediated			
Role	G	Age	Years of Exp.	Role	G	Age	Years of Exp.
Teacher	F	53	4 years teaching home-study	Teacher	F	56	9 years: 6 years teaching early-morning classes; 3 years online home-study
Student #1	M	16	11 grade	Student #1	M	16	11 grade
Student #2	F	15	11 grade	Student #2	F	14	9 grade
Student #3	M	15	9 grade	Student #3	F	17	11 grade

Mid-West Traditional				Midwest Technology-mediated			
Role	G	Age	Years of Exp.	Role	G	Age	Years of Exp.
Teacher	F	53	3 years teaching home-study	Teacher	F	47	2 years online home-study
Student #1	F	16	11 grade	Student #1	M	14	9 grade
Student #2	M	14	9 grade	Student #2	F	16	11 grade
Student #3	M	17	11 grade	Student #3	M	16	10 grade

Table 2 *Timing of Data Gathered*

Timing	Teachers	Students	Parents
Aug.–Dec.	First of year interview, field observations, teacher journal	First of year interview, field observation, week of assignments, UIA assignment	NA
Nov.–Jan.	Midyear interview, audio recorded class, teacher journal	Midyear interview, audio recorded class, week of assignments	NA
Feb.–Mar.	Teacher journal, audio recorded class	Audio recorded class, week of assignments	NA
Apr.–Jun.	End of year interview, teacher journal	End of year interview, audio recorded class, week of assignments	Post-year interview

Table 3 *Actual Data Collection*

Case	Type of Data	Actually Collected
Northern Plains Technology-mediated	Interview	9 Student Interviews (3x3 pre., mid, post school year) 3 Teacher Interviews (1x3 pre., mid., post) 3 Parent Interviews (3x1 all post)
	Observations	3 Audio Observations of 2 different face-to-face settings
	Teacher Shepherding Journals	12 journal entries from the teacher over the course of the year
	Week of Assignments	4 sample weeks from each student, one per term
Northern Plains Traditional	Interview	9 Student Interviews (3x3 pre., mid, post school year) 3 Teacher Interviews (1x3 pre., mid., post) 3 Parent Interviews (3x1 all post)
	Observations	1 Field Observation on site 2 audio observations of the face-to-face class
	Teacher Shepherding Journals	14 journal entries from the teacher over the course of the year
	Week of Assignments	4 sample weeks from each student, one per term
Mid-West Technology-mediated	Interview	9 Student Interviews (3x3 pre., mid, post school year) 3 Teacher Interviews (1x3 pre., mid., post) 3 Parent Interviews (3x1 all post)
	Observations	4 audio and virtual class observations
	Teacher Shepherding Journals	15 journal/blog entries from the teacher over the course of the year.
	Week of Assignments	4 sample weeks from each student, one per term
Mid-West Traditional	Interview	9 Student Interviews (3x3 pre., mid, post school year) 3 Teacher Interviews (1x3 pre., mid., post) 3 Parent Interviews (3x1 all post)
	Observations	1 Field Observation on site

		2 audio observations of the face-to-face class
	Teacher Shepherding Journals	15 journal/blog entries from the teacher over the course of the year.
	Week of Assignments	4 sample weeks from each student, one per term
Totals:	Interviews Total	60 Interviews
	Observations Total	13 Class Observations
	Teacher Shepherding Journals	56 Journal Entries
	Weeks of Assignments	48 Work Examples

Interviews

Interviews were completed with teachers, students, parents, and S&I coordinators. The interviews were audio recorded via a telephone conversation and transcribed for qualitative analysis. Notes were taken as the interviews were conducted, noting the principal researcher's thoughts and feelings. All interview questions tried to follow Spradley's suggested types of interview questions (Spradley, 1979, 1980). The next sections give specific details on the nature of the interviews with each participant.

Teachers. Teachers were interviewed three times over the course of the school year. All interviews were semi-structured. The content for questions in the first interview were broad, hoping to gather overall initial opinions and feelings about learning interactions. Some questions were to build rapport, discussing how the teachers felt about teaching seminary and how they felt about the particular model they were using. The students were asked about what they felt was helped to learn and engage with the content. They were also ask how often and why they engaged with other students in the course. Questions concerning how they felt about the technology they were using were also asked. The first interview lasted between 30 and 45 minutes. The second and third interview questions were derived from the analysis of the initial phase of the study, thereby providing a more focused inquiry which examined the nature of

interactions that seemed to be occurring in the different cases. In each round of interviews the researcher used the thoughts, insights, and understanding gained from the prior interview to better focus the interview. The second interviews (lasting 30–45 minutes) took place at the midpoint of the school year towards the end of January and the third and last interview took place at the end of the school year. The third interview took 20–30 minutes; this final round of interviews was shorter due to the increasingly focused inquiry that happened at each phase of the research.

Students. The 12 students selected from the four groups were interviewed three times. All interviews were semi-structured. The student interviews lasted between 15 and 25 minutes. The initial interview focused on building rapport and gaining a better understanding of the background of who they are as individuals. Additionally, the initial interview questions were asked to identify and detail how they felt about doing the homework and why they felt that way (content) and to describe how they felt about meeting with their teacher and peers in the weekly group class. All questions were directed towards understanding the types of interaction the students experienced in their home-study context. The types of questions that were asked in the two subsequent interviews were determined by examining the data already collected. The major overall domains and themes related to interaction were examined in order to ask specific structural and contrasting questions to better understand the students' experience.

At the end of the year students were interviewed to understand their feelings about the overall seminary experience. These last interviews sought summative opinions of students about the content used, how they felt about the learning interactions with their peers, and whether they felt connected with them and the teacher. In addition to the summative thoughts, specifics were sought through contrasting questions dealing with understanding the L-L interaction.

Parents. One parent of each student involved in the study was interviewed at the end of the school year. This semi-structured interview gathered general perceptions as well as specifics about how often and how long the students engaged with the content being that the 4 days of work were done at home. The interviews took 15–25 minutes and provided information concerning the auxiliary parental support and descriptions of their perceptions concerning the interactions that the students had in seminary. Additionally, the interview sought to identify each parent's feelings about the particular mode of delivery his or her student experienced, i.e., traditional or technology-mediated model.

S&I Coordinator. At the outset of the research, it was anticipated that the four full-time employees who directly supervised the four teachers would be interviewed. The semi-structured interview was to gather feelings, thoughts, and perceptions of the traditional or technology-mediated model. However, it became apparent that the coordinators didn't have enough interaction with technology-mediated program to be able to provide insight about the interactions that were being studied. Casual conversations took place throughout the year with the coordinators that provided insight into the teachers, the teachers' personalities and tendencies. These interviews were not recorded but field notes were taken.

Observations

Live field observations and audio observations at a distance were used to gather data. In total, 13 of the weekly classes were observed and recorded for analysis. The Northern Plains traditional group was observed three times, once in person and twice via phone. The researcher visited and observed in person in October. The subsequent observations were via audio observation. The Northern Plains T-M class participants were observed via audio observation

and audio-recorded by phone three times throughout the year, twice with a group of two students (females) in a weekly class with their mother and once with a male student with his mother.

The Midwest traditional case was observed three times, once in person (also by the researcher in October) and the twice by phone and audio-recorded. The Midwest T-M group was observed and recorded four times via the web-conferencing tool that the group used for their weekly class. Observation field notes and voice and written memos were completed. This observation attempted to discover the types of interactions that take place in class that might be different given the level of interaction they have through the week in the different models.

Artifacts

To gather additional sources of qualitative data with the intent of gaining a deeper understanding of the nature of the interactions in the two models, three sources of written artifacts were gathered. These three types of artifacts are discussed next.

Teacher shepherding journal. As an additional source of data, each teacher wrote down her thoughts, feelings, and happenings in her classes in what was called a teacher shepherding journal. The teachers were asked to write twice a month about the type of interactions they had with their students and their feelings about the face-to-face or virtual experiences they had. They were asked to write about what they felt about their time spent in their various teaching activities and the mode of delivery they used. Three teachers used paper and pencil to complete their journal; one teacher used a blog to record her thoughts. The principal researcher asked that the journals be periodically submitted for qualitative analysis (quarterly and usually before each round of interviews). Those teachers that used paper and pencil for their journals made photocopies and mailed them to the principal researcher in a prepaid envelope. The principal researcher provided question prompts via email and made phone calls to the teachers twice a

month to encourage them to write down their thoughts. These question prompts were changed throughout the year based on the research method of using data analysis of previously collected information to guide subsequent focused inquiry.

Week of assignments. One week of assignments (written work) from all students in the study was gathered each term for a total of four weeks of sample work. The purpose of gathering these assignments was to better understand how and at what levels the students were interacting with the content. This source of data shed light on the nature of learner-content interaction. The assignments for the technology-mediated group were gathered electronically; the traditional group's work was photocopied and sent to the principal researcher for analysis. When possible, the weeks of assignments (across the four cases) were gathered for the same chapter of scripture that was covered in the homework.

Understand, identify, and apply assignment. At the outset of the research it was intended to gather an additional artifact to help understand the nature and level of content interaction. This additional artifact was to be given as an assignment twice during the school year. This open-ended assignment hoped to allow students to interact with content and expound on their own understanding of the content. Another purpose of this artifact was to assess the level of the students' understanding, connection with, and ability to explain how the content could transfer into real life usage. This assignment was given at the beginning of the year but it became apparent that it did not provide any additional information the interviews, observations, and week of assignments didn't already provide. Thus, the principal researcher decided not to administer the second assignment. The next section discusses in depth the data analysis procedures for each type of data gathered.

Analysis Methodology

According to Spradley (1980), “Analysis of any kind involves a way of thinking. It refers to the systematic examination of something to determine its parts, the relationship among parts, and their relationship to the whole. Analysis is a search for patterns” (p. 85). The study analysis used Spradley’s (1979) developmental research sequence (DRS) method because his ethnographic analysis attempts to investigate the participant’s view of the experience from an insider’s point of view and allows participants to elaborate in their own words, rather than imposing terms on them. This research drew from most aspects of his developmental research sequence. Data analysis took place throughout data gathering to assist in focusing and directing the inquiry. The process used Spradley’s (1979) domain analysis, focused observation, taxonomic analysis, selected inquiry, componential, and themes analyses. The purpose of the analysis was to arrive at what Spradley (1980) calls “cultural themes,” which are “any principle recurrent in a number of domains, tacit or explicit, and serving as a relationship among subsystems of cultural meaning” (p. 141). The next section describes the parts of Spradley’s (1979) method that was used in analyzing the data, followed by a description of the major phases of the analysis that took place.

Domain analysis. The first level of analysis recommended by Spradley (1979) is to perform a domain analysis. With domain analysis, the researcher looks at transcripts and fieldnotes from collected data and identifies domains (categories) based on the terms, phrases, or named occurrences used by the participants. Once these occurrences have been identified, cover terms are selected based on identifying semantic relationships between “included terms.” Once these domains and included terms are defined, focused inquiry builds on the initial analysis.

Focused inquiry. Following domain analysis, Spradley (1979) suggests a more focused inquiry. This means that during subsequent data collection opportunities, the structural questions

that are asked during observations and interviews are guided by results of the previous domain analysis to clarify included terms. This process helps the researcher better understand and refine the specific domains that were discovered. Spradley (1979) recommends different types of questions that help gain a deeper look into the domains discovered, called structural and contrasting questions. These types of questions are explained in the following description of the analysis process.

Taxonomic analysis. Once focused inquiries are made, Spradley (1979) suggests that a taxonomic analysis should be performed to "discover if and how the included terms are systematically organized or related within a domain" and to summarize "the relationships among all the included terms inside a given domain" (Williams). The taxonomic analysis generates taxonomies or hypothesized relationships among terms within each domain, as well as ways domains may be organized together under super domains. These proposed hierarchical relationships invite the researcher to further refine the focus of observation and interview questions through selected inquiry.

Selected inquiry. Selected inquiry, especially the asking of contrast questions, is used to deepen the focus developed through previous steps. Earlier descriptive questions provided guidance for conducting a general descriptive overview of domains within the study. Structural questions guided inquiry into the relationships among included terms within the domains selected for focused attention. And now, during selected inquiry, contrast questions guide inquiry into the similarities and differences that exist among the terms in each domain (at all levels—not just among the first level included terms under a given domain cover term but also among the subsets of included terms within included terms).

Componential analysis. The next step in the analysis process is a componential analysis is performed to summarize the dimensions of contrast between included terms within domains. This analysis builds upon the prior processes described above by comparing and contrasting two to three included terms in a domain to better understand the nature of the domain as a whole. This layer of analysis helps "an inquirer takes a better 'reading' of the experiences of people in your inquiry setting and the interpretations and meanings they associate with their experiences" (Williams, n.d.).

Theme analysis. In addition to these "analytic" approaches to discovering the interpretive stances of the people studied, Spradley (1979) suggests the final step is to look across fieldnotes for broad themes. Spradley (1979) identifies several possible "universal themes" to consider; but this step involves standing back from earlier analyses, thinking about synthesizing field experiences and discovered concepts in the words of the participants, while looking for patterns that speak for themselves, and then blending these themes with related patterns from the literature. In this study, the learner-content, learner-instructor, and learner-learner categories Moore (1989) summarized were examined in light of the discovered patterns from domain, taxonomic, and componential analyses.

Analysis phases. With these primary components of Spradley's (1979) analysis described, the following section details how the analyses were carried out in three major phases.

Phase 1. The first phase (October–December) consisted of collecting data through initial interviews, observations, and artifact analysis while completing a domain analysis to identify the major categories (domains) and included terms that specifically described. The researcher first looked at the transcripts from the initial interviews and organized the participants' terms and phrases associated within "domains" that seemed to be part of the participants' experience in the

course. Specifically, terms and phrases (included terms) were taken from transcripts and fieldnotes were grouped according to domains (categories) that seemed to accurately describe participants' description of interactions. A domain analysis was completed for each case from each mode individually. Once all four cases were looked at individually, the domains of each mode, specifically technology-mediated and traditional, were combined and compared. For example, the Northern Plains T-M and Midwest T-M were examined together. The researcher also looked at the fieldnotes and listened to voice memos made from the initial field visits to see if the categories (domains) of interaction that were discussed in interviews were also observed in class. Next the researcher examined the participants' journal entries and other artifacts with the same goal of identifying the possible domains and included terms related to interaction.

Once these domains and included terms were identified, the principal researcher identified cover terms, names for these domains, taken directly from the participants' words. The principal researcher used Spradley's (1979) "domain analysis worksheet" to group and organize the domains and included terms based on semantic consistency (p. 113) in order to have a consistency in the assigning of domains and cover terms. This process included taking each included term (identified utterance) and applying a semantic relationship to the cover term that seemed to best fit the participant's intent when the interviews occurred.

The purposes of this phase of analysis was three-fold: first, to gather a broad description of interactions according to the participants; second, to separate their responses into major domains; and third, to use the cover terms and domains discovered to focus subsequent data collection through focused inquiry. This phase of analysis closely followed Spradley's (1979) DRS. Upon completing this first domain analysis the principle researcher showed the analysis processes with faculty members as well as other student who had used Spradley's (1979) DRS.

Phase 2. Once the initial domain analysis was completed at the end of January 2010, the second round of interviews started. Structural questions were asked to gain insight into the organization and perception of learning interactions based on the domain analysis. After the second round of interviews were gathered, a second domain analysis was completed to verify the included terms, domains, and cover terms identified in the first domain analysis in order to move towards a taxonomic analysis. The taxonomic analysis was carried out to better understand the nature and possible relationships among included terms for the selected domains. This process included taking the information from the two domain analyses, observation fieldnotes, and artifact analyses and assigning hierarchical relationships among the included terms and domains A taxonomy or graphic representation that shows relationships between domains and terms was created for each of Moore's three types of interaction, L-C, L-I, and L-L. Each mode (technology-mediated or traditional) had a separate taxonomy. Each was developed to show the different categories/domains and the relationship to one another based on its position in the hierarchy. For example, within the L-C taxonomy for the traditional cases was called "weekly bookwork" Some of the sub-domains under this title included "types of activities," "ways of getting it done," and "reasons for doing it." Under each of the sub-domains there were included terms or other sub-domains that further delineated the relationships between each of the domains. The goal of the taxonomic analysis was to better understand the relationships among included terms under the domains. Once these taxonomies were constructed, the principle researcher in examining the technology-mediated cases selected parts of L-I interaction and L-L interaction to develop a focused inquiry to more fully understand these specific aspects in the last phase of data gathering.

Phase 3. Once the general taxonomy and secondary taxonomies for the selected domains were constructed and verified with the participants, a third round of data were collected (April–June). Observations and interviews were carried out in light of the more focused inquiry to clarify the nature of the interactions specifically L-I interaction and the teacher's impact on L-L interaction. The third round of interviews was more structured in form and function than the two previous interviews. For the technology-mediated cases contrasting questions were formed to clarify the differences and similarities between L-I interaction and L-L interaction that took place around content. Because of the focused inquiry the interviews were shorter and more direct; however, the interviews did include some summative questions. After the third round of interviews was transcribed, modifications were made to the previously generated domain and taxonomic analyses as needed. Once modifications were completed, a componential analysis was performed to more closely examine the domain of L-I interaction and L-L interaction around content, within the technology mediated cases. The goal was to obtain a clearer thematic description of both. This analysis was extremely helpful in drawing conclusions about the differences between the two cases and the influence of L-I on L-L interaction.

DRS summary. Throughout all phases, memos were written to describe the researcher's thought process during the analyses. This writing assisted the researcher in making explicit his growing understanding of what the participants meant when they used various terms. The writing of these memos helped to assist the connection of what was discovered in the "analytic" aspects of the process with the theme analysis, with the constant goal of looking for meaning throughout the process. Additionally, the seminary program asked for periodic reports. These provided principal researcher the opportunity to condense and describe the themes during the several

phases of the analysis. This condensing and writing for the reports were helpful in verbalizing the themes throughout the process of analysis.

Trustworthiness and Qualitative Standards

The four standards outlined by Lincoln and Guba (1985) and Guba and Lincoln (1989) for naturalistic inquiry were used to verify credibility, transferability, dependability, and confirmability of the project (Guba & Lincoln, 1989; Lincoln & Guba, 1985). This study drew upon chapter five of Dr. David Williams' online book, *Educators as Inquirers: Using Qualitative Inquiry* (Williams, n.d.). In his book, Dr. Williams provides questions to assist the researcher in considering the different aspects of each standard. These questions provided prompts for the following discussion addressing how this research maintained trustworthiness. His six questions are discussed in the following.

Credibility

First, "Is prolonged engagement adequate?" This research was designed to gather and analyze data for the course of one entire school year. The data were collected in three separate time periods to allow analysis before the next collection of data, in order to focus and guide further inquiry.

Second, "Is persistent observation adequate?" In this study the observations were unique given the nature of the different modes of delivery in the cases. The observations for the traditional group consisted of a visit by the researcher at the beginning part of the year, followed by two to three audio-recorded face-to-face class sessions. In the online environment the face-to-face elements were different; the classes could meet virtually all together or in small parent-teacher groups. The observations in this sense were not in person, but were completed virtually or by audio-recording sessions and were completed from a distance. The Northern Plains T-M

group was observed in this manner three times and the Midwest T-M group four times. In addition to the interviews and observations, the principal researcher was able to meet with the Midwest T-M teacher in person for the second interview and meet with the Midwest Traditional class on a second occasion at the end of the year. When the principal researcher contacted the teachers about the teacher shepherding journal, there were many informal conversations about their classes and their experience. These informal conversations allowed the principal researcher to confirm and verify domains, included terms, and intended meaning with the participants.

Third, “Is triangulation adequate?” First, the research drew upon several sources of data including observation, interviews, and written artifacts to understand the interactions and learning outcomes of the participants. Second, a triangulation matrix was used in developing the taxonomies and identifying the included terms used in the domain analysis, as well as where those included terms came from, whether it was from interviews, observations, journals, or artifacts. Third, the study tried to capture the perspective of the home-study programs from three sources—the students, teachers, and parents.

Fourth, “Is peer debriefing adequate?” The assistance of peers from within and out of the S&I context were used to check the thinking of the principal researcher in his development of the domains and themes. “If the inquirer ‘finds’ only what he or she expected to find, initially, or seems to become ‘stuck’ or ‘frozen’ on some intermediate construction [interpretation], credibility suffers” (Guba & Lincoln, 1989, p. 238). Although the coordinators didn’t provide as much information in the interviews as was originally thought, they did provide descriptions of the teachers’ efforts in terms that allowed the principal researcher to check his thinking, conclusions, and assumptions, which had been formed at a distance. Additionally, as part of the reporting process to the seminary program, the principal researcher was able to interact with the

S&I developers of the online program as well as the traditional home-study curriculum team to discuss themes and check assumptions. Faculty and fellow students who were versed in Spradley's (1979) DRS were also used to check the data analysis process as well as decisions made during the different phases.

Fifth, "Is negative case study analysis adequate?" The varying personalities and standpoints (teachers, students, and parents) provide variety of input that will allow for many possible explanations and contrasts from the experiences of the participants. The principal investigator was also employed by S&I. Therefore, his subjectivity was at times suspect. To compensate he used both member checks and peer debriefing. Peer debriefing also helped the adherence to Spradley's (1979) developmental research sequence; however, other researchers did not complete a similar domain analysis on the same data to check domains and cover terms. However, in informal conversations the teachers involved were asked for clarification or explanation based on the themes in the domains and taxonomic analyses. The worksheets and coded data were not shared with other S&I employees because it was difficult to find interested parties who had experience in qualitative analysis. Worksheets and process were shared with others who used Spradley's DRS as part of their research, asking them for thoughts, feelings, and impressions about the analysis.

Sixth, "Are member checks adequate?" Member checks were used informally to help the researcher understand the perspectives of the participants. Possibly, the researcher should have relied more on the feedback from such checks throughout the data analysis, rather than just towards the end of the third phase of research. Several conversations took place after the school year ended to verify and check themes. Narratives that were generated as part of this study were read and discussed between the teachers and several students involved.

Transferability

Descriptions within the narratives in the journal articles contain vivid contextual detail to assist the reader in understanding the context and climate of the educational environment. Understanding the interactions in the context that they occurred provides the context needed to apply the findings towards the future design and development of distance/blended learning courses.

Dependability

An audit trail was kept from the design and preliminary discussions of this prospectus through data gathering, data analysis, and category and theme development. The audit trail consisted of 27 single-spaced pages containing many entries over the course of the research, particularly during the domain and taxonomic analysis. Additional interviews, conversations, and reports that occurred during the analysis were part of the audit trail. The audit trail discusses the details behind why, when, and how decisions were made. The audit trail was written to clarify the direction of the research. Memos and reflective audio recordings were recorded to follow the thought process throughout the study.

Confirmability

The audit trail accounted for the details and description of the research. It details the activity of peer-briefing and member checks. The participants were included heavily during the third phase of analyses to arrive at a negotiated understanding of the themes and narratives that come from the research.

Limitations

Several limitations have been identified in the design and development of the research. First, this was a qualitative study carried out in a distance education environment. Much of the

interaction and rapport building took place online and by telephone. Some interviews were completed initially without ever meeting face-to-face. Several of the observations were done at a distance, which were at times hard to observe and record. In order to understand the qualitative process at a distance and online, the principal researcher tried to familiarize himself with the best practice and literature.

Second, the amount of data that were collected was daunting. During the second and third phases of analysis, the principal researcher was selective in choosing which data would be included in the analysis. It was imperative that initial and ongoing analysis was guided and focused by the goals of the research. To do this, purposive sampling was used to choose the data that was used to guide the next interviews. However, students were interviewed and followed throughout the entire school year.

Third, this research was completed with minors. Little information exists on the predominant personality and study habits of distance K-12 learners. Hopefully, this study provided some rich descriptions of several young distance learners. The context of this study was specific, but general principles could be helpful for other subjects taught at a distance; however, the subject matter of the context often influenced the what and why behind the communication.

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