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How Students Experience *Teach-One-Another* Activities in Online Courses at Brigham Young University-Idaho

Joshua Alan Holt
Brigham Young University - Provo

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Joshua Alan Holt

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Charles R. Graham, Chair
David D. Williams
Russell T. Osguthorpe
Peter J. Rich
Randall S. Davies

Department of Instructional Psychology and Technology

Brigham Young University

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ABSTRACT

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As online learning enrollments rapidly increase, it is vital to explore effective course designs that deepen students' learning experiences. This multiple-case study explores four online courses at Brigham Young University–Idaho that include learning activities where students learned through *Teach One Another* activities. *Teach One Another* is similar to Reciprocal Peer Learning where students simultaneously learn and contribute to their peers' learning.

Findings across the cases of this study show that *Teach One Another* activities in online courses encourage students to be accountable and motivated to complete individual course work as well as group assignments. As students learn to build trusting learning relationships, group activities may deepen students' learning experiences. This study discusses implications for online course designers, developers, and administrators who are interested in giving students opportunities to deepen their learning of the content and develop life skills such as accountability, responsibility, and trust.

Keywords: online learning, Brigham Young University–Idaho, reciprocal peer learning

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Introduction

In an era of advancing technologies, most universities now offer classes or even complete degree programs delivered fully online. The report *Staying the course: Online education in the United States* claims that 22% of American college students took at least one web-based class in the Fall 2007 semester, an increase of 13% from the Fall 2006 semester. Overall higher education enrollment, however, increased by only one percent over the same time period (Alfred P. Sloan Foundation, 2008). Student enrollments in online courses are expected to continue to grow.

Recent economic conditions have many educational institutions trying to implement online education as a cost-saving option for both the students and the university. As the demand for online courses increases, universities are left scrambling to create and deliver courses that meet the needs of the students. Developing an online program that meets the needs of a diverse online student body and also meets the standards of a traditional university has many challenges. This study will share some experiences of university students in recently-created online courses that are designed to align with a university-wide model for learning that emphasizes student-to-student interaction.

Background

Brigham Young University–Idaho (BYU–Idaho) distinguishes itself as a teaching university. There are no graduate degrees conferred, no faculty rank, and all faculty carry a full-time teaching load (Brigham Young University–Idaho, 2000). The university motto at BYU–Idaho is “Rethinking Education.” The four-year, undergraduate-only university lauds itself as an institution that focuses on improving teaching and learning while fulfilling the university mission (see Appendix A). Thus BYU–Idaho is in the process of implementing a distinctive approach to

developing and delivering online courses that is focused on student peers learning and teaching each other.

In early 2009, Brigham Young University–Idaho announced a significant enrollment expansion, a nearly 30% increase that relies almost exclusively on online class enrollments (Brigham Young University–Idaho, 2009a). The BYU–Idaho online learning initiative will require creating 140 new online courses to meet this anticipated student demand. Each course will offer several online sections totaling approximately 100,000 student credit hours (Brigham Young University–Idaho, 2008a). Other traditional institutions of higher education are also adopting major online course enrollment initiatives. For example the Minnesota State Colleges and Universities (MnSCU) recently announced a goal of having 25% of the MnSCU student credits earned through online courses by 2015 (Minnesota State Colleges and Universities system, 2008).

Key characteristics of the BYU–Idaho online learning experience for students that apply to this study have been set forth (Brigham Young University–Idaho, 2008a):

- Online courses are developed by designated full-time BYU–Idaho faculty teams working with a full-time curriculum development team.
- Online courses are built around the BYU–Idaho Learning Model principles and process (Brigham Young University–Idaho, 2007).
- *Teach One Another* is a hallmark characteristic of BYU–Idaho online courses, with significant personal contact in a course between students, their peers, and their instructor.
- Online courses are cohort-based, meaning the students move together as a group through a structured learning experience.
- Online courses are designed to have students work in groups of 10-15, with no more than 60 students in a section.

The BYU–Idaho Learning Model

The Brigham Young University–Idaho Learning Model (2007) is a faculty-produced document that outlines principles and assumptions that apply to all aspects of the BYU–Idaho experience. These BYU–Idaho Learning Model assumptions and principles are broad statements of desired outcomes that should be part of every aspect of a student's experience at BYU–Idaho (Appendix B). Additionally, the learning process is written in a way that demonstrates how the learning principles may be applied. The learning process has three phases: (a) *Prepare*, (b) *Teach One Another*, and (c) *Ponder/Prove*. This process includes both student and faculty perspectives. The "*Teach One Another*" phase is a hallmark of BYU–Idaho online courses, and is defined in the following paragraphs.

***Teach One Another* student process.** There may be a wide variety of different methodologies, styles, and techniques used in the class, but there are some common elements: everyone is on time; there is a prayer; students are actively engaged—listening, speaking, thinking, discussing, presenting; the Spirit is present; there is a feeling of charity; all are edified of all.

***Teach One Another* faculty process.** Faculty members focus on teaching by the Spirit and helping students actively engage with the material and each other by using a variety of methods and approaches. They provide support as the students teach one another. Faculty members listen carefully in order to guide students and to learn from them. There is a spirit of mutual benevolence in the classroom, and all are edified together.

The principles and process steps found in the BYU–Idaho Learning Model are not meant to be prescriptive, but rather provide a common language and framework around which the campus community can collaborate. Because of the lack of specificity, this new terminology has

also provided enough flexibility to allow faculty members to try new ideas in the classes they teach. There are also many new ideas regarding how this paradigm might be applied in new online courses.

It is important to note that BYU–Idaho is affiliated with a religious organization, and as such is interested in spiritual development of the students. This is evident in the some of the features of *Teach One Another* that list spiritual principles (see Table 1 below). Therefore it is important to note that *Teach One Another* is a learning and teaching strategy that not only guides the structure of the learning experience but also gives spiritual principles to follow. While there are many scholarly fields that may have some connection to the features of *Teach One Another*, this study did not attempt to synthesize all of them. This study did identify the learning theory of Reciprocal Peer Learning as a tightly connected academic area of study to *Teach One Another*, and has aligned these two strategies to apply their common features for use in this study.

Reciprocal Peer Learning

The BYU–Idaho Learning Model, and *Teach One Another* that is part of it, is not a scholarly work that references academic literature. This study identified the theoretical framework of Reciprocal Peer Learning as the academic field of study that most closely aligns with the features of *Teach One Another*. The central feature of Reciprocal Peer Learning is that peers learn both from and with each other (Boud, Cohen, & Sampson, 2001; Sampson, Cohen, Boud, & Anderson, 1999). Boud (1999) identified seven features that define Reciprocal Peer Learning. Table 1 below aligns these seven features of Reciprocal Peer Learning theoretical framework with the features of BYU–Idaho's *Teach One Another* learning and teaching framework.

Table 1
Features of Teach One Another and Reciprocal Peer Learning

Features of *Teach One Another*	Features of Reciprocal Peer Learning
Students are actively engaged.	Students have increasing opportunities to engage while not in the presence of a "teacher."
Students teach one another.	Students learn both from and with each other.
Students apply what they are learning.	Students practice communication and knowledge application.
Students are responsible for learning and teaching.	Students take responsibility for own learning and the learning of peers.
Students treat others with respect.	Nothing specific.
Spiritual features: begin with prayer, listen to the Spirit/Holy Ghost, feel charity, all are edified together.	Nothing specific.
Nothing specific.	Students learn how to learn.
Nothing specific.	Students work together with others who share a common goal.
Nothing specific.	Students develop collaboration skills by working together.

This study focused primarily on the four common features of *Teach One Another* and Reciprocal Peer Learning (see Table 1). The features that do not have a specific counterpart were not a focus of the study, but were noted throughout the study where applicable. Features that do not have a specific counterpart may still have some implicit connection with the other framework. For example, there is not a specific statement in the Reciprocal Peer Learning strategy that states students should treat each other with respect, as there is with the *Teach One Another* framework. However this does not mean that respectfulness is not important to Reciprocal Peer Learning—it just was not identified as a core feature. Additionally, some of the features listed as exclusive to

Reciprocal Peer Learning may also be important to BYU–Idaho, but were not listed as an attribute of the *Teach One Another* principles.

There are several influences that have prompted this research study. First, designing, developing, and delivering online courses that are aligned with the BYU–Idaho Learning Model are new and challenging endeavors. As highlighted above, the *Teach One Another* step in the BYU–Idaho Learning Model process is a hallmark characteristic of the online courses at BYU–Idaho and as such warrants a closer look. Second, Reciprocal Peer Learning shares many similar features with *Teach One Another*, and there is a shortage of information about online courses that apply a Reciprocal Peer Learning strategy. There are many things to learn from early experiences of students in the online class activities that are meant to be rich learning and teaching opportunities for students separated by both time and distance.

Statement of Problem and Purpose

Delivering courses online creates some challenges in finding ways to architect a learning activity that embodies the *Teach One Another* philosophy. About 15 to 20 new online courses at BYU–Idaho are developed each semester. The designers of these new courses try to incorporate the BYU–Idaho Learning Model principles and process steps in their design and delivery. Each course implements the *Teach One Another* principles in a unique way, trying to match the course curriculum design with the available online learning technologies to facilitate student and teacher interactions. This study addresses the general lack of understanding about a student's experience as they work through *Teach One Another* learning activities in online courses.

The purpose of this research study is to provide insights in answering the following question: "How do students experience *Teach One Another* activities in online courses at Brigham Young University–Idaho?" This study is not an evaluation of the learning activities and

does not suggest any causality between the activities and student achievement. This study provides a rich description of the student learning experience as they participate in the *Teach One Another* activities, as shared by a sample of the students and their instructors.

Research Question

The overall objective of this study was to explore the student experiences with online *Teach One Another* activities that were built into four BYU–Idaho online courses taught during the Winter 2010 semester. The study looked at these experiences from the student's perspective, from the student's work in the course, and also from the perspective of the student's instructor.

The study has sought to answer the following primary research question: How do students experience *Teach One Another* activities in online courses at Brigham Young University–Idaho? Information for this study was focused on two parts of the student experience: (a) the process and implementation of the *Teach One Another* learning activities and (b) the students' attitudes and perceptions of the experience.

Literature Review

The BYU–Idaho Learning Model was developed by the faculty at Brigham Young University–Idaho and is an institutional document specific to the mission of the campus. However, there are many related and connected areas of study in the literature. This literature review will first examine the *Teach One Another* portion of the BYU–Idaho Learning Model and then other areas related to this study.

The BYU–Idaho Learning Model and *Teach One Another*

During an annual university conference in 2006 the new university president, Kim B. Clark, challenged the faculty at BYU–Idaho to articulate a document that would represent a common language and philosophy about learning and teaching on campus. After several semesters of effort and input from hundreds of faculty members, in September 2007 an eighteen-page document titled *Learning Model* was published by BYU–Idaho.

In a message posted on a faculty website that teaches about the BYU–Idaho Learning Model, President Kim B. Clark explained, "The Learning Model entails the creation of a common framework for learning and teaching that extends across every discipline, course, and learning experience" (Brigham Young University–Idaho, 2008b). The BYU–Idaho Learning Model attempts not to prescribe specific pedagogies or teaching approaches but instead to define a common learning and teaching terminology so the various methods of teaching can be shared and discussed by everyone on campus.

A website has been developed to promote and inform the students about the BYU–Idaho Learning Model. It suggests the BYU–Idaho Learning Model “was created to deepen the learning experiences of students at BYU–Idaho” (Brigham Young University–Idaho, 2009b).

This website also highlights the role of the students by stating, “The Learning Model enables students to take greater responsibility for their own learning and for teaching one another.”

The BYU–Idaho Learning Model document consists of four main sections: a vision statement, underlying assumptions, principles, and process steps. The vision statement, underlying assumptions, and principles can be viewed in Appendix B—a facsimile of the first page of the BYU–Idaho Learning Model. The process steps are defined later in the document and are listed here: (a) *Prepare*, (b) *Teach One Another*, and (c) *Ponder/Prove*. Of particular interest to this study is the area of *Teach One Another*, which will be discussed here further.

The phrase *Teach One Another* has religious and contextual meaning to those at BYU–Idaho, which is a private university owned and operated by the Church of Jesus Christ of Latter-day Saints. The phrase *Teach One Another* originates from verses of scripture found in the canonized text, Doctrine and Covenants section 88 verse 118, “And as all have not faith, seek ye diligently and teach one another words of wisdom; yea, seek ye out of the best books words of wisdom; seek learning, even by study and also by faith.” Using this scriptural and religious phrase, the ideals of the *Teach One Another* learning process phase are further defined in the BYU–Idaho Learning Model document to detail its purpose and definition.

The purpose of *Teach One Another* is defined in an overview document that was distributed to faculty. It states: “*Teach One Another* allows students to participate, ask questions, listen, and take greater responsibility for learning. The core principles include

- Students learn more when they teach
- Teaching allows students to act
- Action invites the Holy Ghost to teach”

While no specific reference to any academic influences are made in the BYU–Idaho Learning Model manuscript, there are related areas of research in educational fields that can be connected to the different parts of the principles and process steps. The remaining sections in the literature review highlight the areas of cooperative learning, peer learning, and online peer learning, which each share some characteristics with the online *Teach One Another* focus of this study.

Cooperative Learning Tradition

The key learning principle of students learning together is historically rooted in the educational research field of cooperative learning. The generic term cooperative learning can and is applied to any form of working together in schools (Topping & Ehly, 1998a). There is a substantial body of literature that promotes the benefits of cooperative learning (Johnson & Johnson, 1997; Johnson & Johnson, 1999). Others have generalized and connected peer learning to both collaborative learning and cooperative learning (Boud, Cohen, & Sampson, 1999; Monari, 2005; Sampson, Boud, Cohen, & Gaynor, 1999). Although the peer learning strategies are historically connected to cooperative learning, Boud (2001) also cautions that most of the applications of cooperative learning are not in higher education.

The term collaborative learning is used more frequently in higher education. Differentiating between collaborative learning and cooperative learning is a difficult question, and many use the two terms synonymously (Graham & Misanchuk, 2004; Topping & Ehly, 1998a). In a comparison study of six popular collaboration and cooperative learning strategies, Davidson (1994) found fourteen attributes that help distinguish between the strategies. Some purport that cooperative learning tends to keep the traditional authority structures of teacher and learner more than collaborative learning (Boud, 2001; Gamson, 1994). Another difference is that

cooperative groups tend to rely on a strategy that divides and assigns out the work in chunks (Graham & Misanchuk, 2004; Monari, 2005).

It is common in the workplace to work in groups on projects, even in groups that are separated by significant distances. Much of the early literature on computer-mediated group work came from the workplace (Graham & Misanchuk, 2004). While this information can be useful, there are distinct differences in the characteristics of learning groups and work groups. Graham and Misanchuk (2004) identified at least six significant differences between work groups and learning groups. Another group learning strategy that is distinct from peer learning is Team Learning. In team learning, groups often appoint a team leader to coordinate the progress of the team. Because this study uses learning groups of various sizes that may not be designed with a team leader, the specific term "peer learning" is important to differentiate the context of this study and is important to use instead of other similar terms such as team or group.

Peer Learning

Boud, Cohen and Sampson (1999) defined peer learning as "the use of teaching and learning strategies in which students learn with and from each other without the immediate intervention of a teacher." Informal peer learning happens anytime two or more people interact and learn from one another. Thus ad hoc peer learning has always been part of student life. More formal or structured peer learning activities strategically designed into the educational strategy of a course allow the fullest extent of the learning outcomes to be achieved (Boud, 2001). Peer learning is not a limited educational strategy, but instead encompasses a broad scope of activities. For instance, Griffeths et al. (1995) identified ten different models of peer learning.

Peer learning attempts to differentiate itself from other group-based learning strategies by focusing on two distinctions. First, Boud (2001, p. 6) points out that a common misconception is

that peer learning is simply about using group work in courses. Certainly group work can involve peers learning from each other; however, peer learning often occurs one-to-one, not necessarily in a larger group. Second, peer learning is not primarily about learning to work in groups (Boud, 2001).

Many terms are closely related to the general ideals of peer learning, including peer-assisted learning (Topping & Ehly, 1998b) and peer instruction (Gilbert, Hunsaker, & Schmidt, 2007). Additionally, there are many other terms that are viewed as a specific application or techniques of peer learning principles: supplemental instruction, peer tutoring, peer support (Pendleton, 2005), reciprocal peer learning (Sampson, Boud, Cohen, & Gaynor, 1999), syndicate groups (Boud, 2001), mutual peer tutoring, peer assessment, peer counseling, peer education, peer monitoring, and peer modeling. This study specifically identifies the area of reciprocal peer learning as the closest strategy intended to be implemented in the design of the learning activities for the cases in this study.

In contrast to the general area of peer learning, Reciprocal Peer Learning specifically focuses on a central feature—that peers learn both from and with each other (Boud, et al., 2001; Sampson, Cohen, et al., 1999). This two-way, mutually beneficial learning environment provides for an enriching synergy in the life of all participants (Gong, 2002). Working together with others who share a common goal is one feature of Reciprocal Peer Learning. Other features of Reciprocal Peer Learning include developing collaboration skills by working together, sharing a common goal with others, taking responsibility for your own learning and the learning of your peers, learning how to learn, practicing communication and knowledge application, and increasing opportunities to engage in reflection and exploration of ideas not in the presence of a "teacher" (Boud, 1999).

Walter A. Gong (2002) taught that as individuals become responsible for their own learning, and contribute to the learning of others, they learn as much as they are capable. This synergy of learning and teaching is what Gong called "exponential growth." Gong also suggested that by taking on the roles of both a learner and teacher, one connects themselves to both the past, through their teachers' teachers, and to the future through their learners' learners.

Peer learning is being used more frequently in university courses (Boud, et al., 1999; Sampson, Boud, et al., 1999). Reciprocal Peer Learning has been used in a variety of different settings at the university level: academic professional development (Boud, 1999; Keppell, Au, Ma, & Chan, 2005; Ryan, Hanrahan, & Duncan, 2000); graduate and undergraduate programs and in diverse subject areas such as law, business, computing, education, and design (Sampson, Boud, et al., 1999); language education (Blanch, Duran, Thurston, & Topping, 2008; Dunworth, 2002); and in learning new technologies (Ryan, Hanrahan, & Duncan, 2000).

In a recent research study at a Brigham Young University, Robison (2006) details the potential of structured activities where students engage in teaching as learning. Her study involved a large enrollment (N=263) introductory Biology course during the winter 2006 semester. The students were assigned to teach the concepts they understood from the readings and homework assignments to another person. The study revealed an increase in student learning from 44% to 77%, and also showed that the students felt more in control of their learning.

As the growth of online courses continues to outpace the growth of on-campus courses (Alfred P. Sloan Foundation, 2008), finding ways to successfully facilitate peer learning activities online is a major priority. The next section takes a closer look at how implementing peer learning has been tried in online settings.

Online Peer Learning Activities

To include technology in teaching and learning is not enough; it "is necessary to develop innovative methodologies in order to integrate successfully computers into the curriculum" (Blanch, Duran, Thurston, & Topping, 2008, p. 1). Bruffee (1993) makes an early connection between collaborative learning and instructional technology and suggests breaking from traditional assumptions to help ensure successful and effective educational technology experiences. The Academic Technology Center at Worcester Polytechnic Institute (2007) affirms this finding, "Teaching online in a distance learning program requires instructors to completely rethink how they deliver their courses. Interaction is one of the most difficult aspects of education to build into an online class, but it is also one of the most important" (¶ 1).

Despite the discussion found in a section above concerning the differences between the terms peer learning and collaborative learning, much of the recent literature in the area of computer-supported collaborative learning (CSCL) is the closest the researcher could identify to online peer learning. Monari (2005) stated, "In a collaborative learning environment, the role of technology is to help students learning together effectively" (p. 8).

Palloff and Pratt (2005) report that students harbor feelings of isolation when working online. Designing collaborative peer learning activities into the curriculum of all online courses is a strategy that BYU–Idaho is implementing to address this concern and reap additional benefits. Collaboration in online classes is believed to increase student satisfaction with the learning experience, and more importantly enhance learning outcomes and reduce the sense of isolation (Gunawardena & Zittle, 1997; Palloff & Pratt, 2005). Conrad and Donaldson (2004) state, "[The] collaborative acquisition of knowledge is one key to the success of creating an

online learning environment. Activities that require student interaction and encourage a sharing of ideas promote a deeper level of thought" (p. 5).

Creating opportunities for people to interact with one another in an online course requires the correct technology tools and someone to design the experience. Interaction does not naturally occur in online courses, it has to be intentionally built into the instructional plan for the course (Academic Technology Center at WPI, 2007). Moore (1989) suggests that distance educators categorize interactions into a minimum of three basic categories: (a) Learner-to-Content Interaction, (b) Learner-to-Learner Interaction, (c) Learner-to-Instructor Interaction. Building these different interaction opportunities between the instructor, students, and their peers using the correct technology tools is vital to implementing a successful peer learning strategy for online courses.

This study examined the student experience in online courses at BYU–Idaho. These courses have been developed with *Teach One Another* activities. *Teach One Another* is a part of the BYU–Idaho Learning Model, and is closely aligned with the scholarly work of Reciprocal Peer Learning. There is very little information available that discusses the theoretical framework of Reciprocal Peer Learning in an online setting. The research in this study may be applied to many general areas of collaborative learning; however, this study used Reciprocal Peer Learning as a framework to examine the student experience in online courses.

In summary, this review of the literature first considered the BYU–Idaho Learning Model and highlighted the specific process step from that model that this study is focused on—*Teach One Another*. While the BYU–Idaho Learning Model document used terminology that is familiar to the culture on the campus, many of the spiritual overtones are unfamiliar outside of the campus community. Therefore the researcher highlighted three areas within the academic

literature that have some connecting ideas to the BYU–Idaho Learning Model and *Teach One Another*: cooperative learning, peer learning, and computer-supported collaborative learning.

The review took a historical perspective by discussing the tradition of cooperative learning in the classroom. This tradition gave many educators new ideas about how students could influence one another in a positive learning environment. One specific implementation of this learning strategy is peer learning, which was covered extensively. Peer learning was developed as a classroom teaching method to encourage students to learn from one another. Research in computer-supported collaborative learning introduced technology into the group learning process. Finally the researcher identified a specific strategy called Reciprocal Peer Learning as the closest to the core principles of *Teach One Another* that has been written about in the academic literature. The next chapter defines the research methods used to examine students' experiences with *Teach One Another* learning activities in online courses.

Case Study Methodology

This study employed a qualitative case study approach for data collection and analysis. "Case study research holds a long, distinguished history across many disciplines" (Creswell, 1998, p. 62). The field of education is particularly well suited for case study research. Case studies have frequently been the method of choice among experienced investigators in education and have produced important data and ideas and have helped to advance educational research (Yin, 1993). Yin further suggests case study research should be used in situations where (a) context is important and (b) events cannot be manipulated, as they can in an experiment (p. 39). Stake (1995; 1995) suggests case studies are appropriate for the study of relatively new or emerging phenomena. This study fits each situation because the context of the course is important for the activities, the course content has been previously designed and is not easily manipulated, and these activities are part of new online courses in a new university initiative. Lancy (1993, p. 6) summarizes that a typical focus of case study research is analysis of innovative educational programs.

Collective case studies use multiple cases that are jointly studied as a means of inquiry into a phenomenon (Stake, 1995). Yin (2003) proposes it is preferable for a case-based research design to include multiple cases instead of only a single case. Yin (1993) states that multiple-case studies should follow replication logic. When using replication logic, the investigator identifies cases that show similarities, to demonstrate a pattern. A replication logic strategy is preferable to a strategy that attempts only to demonstrate differences across cases (Yin, 1993, p. 34). For this study, replication logic is used because all of the cases were developed within a similar framework, including *Teach One Another* activities, and with similar design standards. However, these cases all come from different academic disciplines and use different interaction

strategies and technologies. The specific data collection methods will now be discussed for this study that will use a collective case study method that relies on replication logic.

Data Collection

Data collection primarily utilized qualitative methods. The qualitative data collection methods included course document reviews, instructor interviews, and student interviews. The study also used a student survey. The survey data collected was intended to give the researcher a broader perspective of the student experience in the class activities by reaching more students than were interviewed. The survey was also used to sample the students for interviews. Additionally, a cross-case comparison analysis was conducted to consider the similarities and differences identified in the cases.

Procedure. The researcher first compiled a list of all online courses being taught Winter 2010 semester at BYU–Idaho. Several administrators in the online courses division were consulted to identify and exclude any courses that should not be included in this study. An email was then sent to the instructors of the remaining 43 courses requesting permission to use their class as part of the study. Included in the email request was a summary of the research question and methods. Of the 43 course instructors emailed, 25 instructors responded in a timely manner and granted permission to use their courses for the study.

A survey was then sent to all of the students enrolled in each of the 25 online courses. Four cases were then selected following the case sampling procedures detailed in the section below. Once the case samples were determined, the students to be interviewed were identified following the procedure explained in the Interview Sampling section below. Interviews with the selected students and the instructors were scheduled as soon as they could be arranged. The study procedures were intended to be minimally invasive to both student and instructor time by taking

less than one hour. All but two interviews were conducted over a recorded telephone conversation. One exception was an instructor interview that took place in the researcher's on-campus office. The other exception was a student who was in Italy. Several attempts were made to conduct the interview via the phone and Skype without a reliable connection, so the interview was typed and submitted through email.

Once all of the interviews were completed, the researcher reviewed any additional online interactions or materials that were available for each case that was part of the *Teach One Another* activities.

Case sampling. A purposeful case selection strategy identified cases that were offered during the Winter 2010 semester at BYU–Idaho and included repeated *Teach One Another* activities. Each identified case that was selected had a typical *Teach One Another* activity within the class. The specific classes in which the cases were identified were recently developed as part of the BYU–Idaho online initiative (Brigham Young University–Idaho, 2008a). Cases were selected using a maximum variation strategy in order to look at a variety of different *Teach One Another* activities. The four cases chosen were purposefully identified based on three criteria. One criterion was the size of the group, whether the course exhibited a full class activity or a smaller group activity. Another criterion was whether the activity happened in real-time (synchronous) or not real-time (asynchronous). The final criterion considered when selecting the cases was attempting to represent different academic disciplines. Before a case was considered for this study, a sufficient number of students needed to indicate on the survey that they were willing to be interviewed to continue the data collection. In determining cases that are purposeful, Patton (1990) notes that "The underlying principle that is common to all these [purposeful,

qualitative sampling] strategies is selecting information rich cases" (p. 181). Table 2 lists the selected cases and identifies the characteristics of each.

Table 2
Case Name, Activity Name, Course Name, and Criteria

Case Name	*Teach One Another* Activity Name	Course Name	Criteria
ENG 335 Case	Discussions	American Literature	Asynchronous, Large Groups, Small Groups
FDMAT 108 Case	Team Homework	Math for the Real World	Synchronous, Small Groups
FDREL 211 Case	Group Activity	New Testament	Synchronous, Small Groups
FDSCI 205 Case	Jigsaw	Understanding DNA	Asynchronous, Large Groups, Small Groups

Survey data. The student survey is made up of eleven questions and was anticipated to take 12 to 15 minutes to complete (see Appendix C). The survey questions were reviewed and refined by the researcher in conjunction with Dr. Randall Davies and peer debriefers to ensure the relevance of the questions in relation to the purposes of the study.

The data collected from the survey had two purposes; the first was as a sampling instrument in identifying the students to select for interviews, and the second was to provide the researcher with a broad perspective of the student experience with the activity. This broad perspective informed the researcher about demographics of the student experience with the *Teach One Another* activities, which were used to guide asking specific questions in the student interviews. For example, if the students in one class report that on average the activity took them a very long time, then the researcher could ask specific questions behind the activity's length.

The descriptive data from the survey was also used as part of the cross-case analysis when the researcher looked for similar and unique aspects across the cases.

Interview sampling. For each of the cases, at least four students and the instructor were interviewed. The student survey identified those students willing to participate in a follow-up interview by the student response to Question #11. In three of the cases there were seven or fewer students who marked they were willing to be interviewed, so all of the willing students were invited to participate in a follow-up interview. Case Three had 14 willing students, so the researcher used the following strategy for sampling.

Selecting the students to be interviewed followed a maximum variation sampling strategy (Patton, 1990) to identify students with a range of different participation levels in the *Teach One Another* activities. Using additional data from each survey, the top three and bottom three students were selected that indicated different levels of participation with the learning activity in the case. The level of student participation was determined from the responses to Questions #2, #3, #8, and #9 on the student survey. These questions ask about the students' commitment, effort, contributions, and level of enjoyment with the activity. In order to get a broad range of perspectives in the student interviews, participants selected had the most contrasting responses to the survey questions listed above.

Interview data. Merriam (1998) explains that "Interviewing is probably the most common form of data collection in qualitative studies" (p. 70). The researcher contacted each instructor and the selected students to arrange a time for the interviews to occur. All but two of instructor and students interviews took place individually over a recorded telephone call. The two exceptions were an in-office visit and a typed email response. The researcher guided the interview with a semi-structured question sheet (see Appendix D for student interview questions

and Appendix E for instructor interview questions). Each interview was digitally recorded and archived by the researcher for the duration of the study.

Document review data. The researcher accessed and reviewed the online documents, materials, blog posts, discussion posts, assignments, assessments, or other files that were part of each activity for the cases. These may also include any instructor participation during the activity. Two of the cases used an asynchronous threaded discussion forum that was available to the researcher for writing the narratives, as passages quoted to triangulate the themes in the thematic analyses.

The other two cases used a synchronous group gathering activity where the students had a text or audio chat session. Data from these live sessions was not available to the researcher, so the information from the student interviews was used for these cases. Some cases also had other assignment documents that help the student prepare for the *Teach One Another* activity, give them an opportunity to report or reflect on the experience, or other evaluation instruments that the students submit as part of the class assignments. These artifacts were downloaded and used to enrich the case narrative as well as to triangulate the data that the students and instructors gave in the survey and interviews.

Role of the Researcher

In qualitative research the researcher is the primary instrument used for data collection and analysis. Therefore, the primary researcher for this study formed the questions, conducted the interviews, reviewed the course documents, interpreted the data, and reported the findings. Creswell (2003) states “qualitative research is interpretive research.” He continues by saying that “inquirers explicitly identify their biases, values and personal interests about the research topic

and process" (p. 184). By setting forth my biases and relevant past experiences in the beginning, I hope to both inform the reader and myself of the effect they may have on the study.

Just over four years ago I began working as an instructional designer at BYU–Idaho. My position in the Academic Technology department has included much variety as I have interacted with many different faculty across campus on integrating technologies into their teaching, developing instructional materials, creating new courses, and many other projects. I also spent some time as a student at Ricks College, which was the name of the two-year school that is now BYU–Idaho.

Prior to my employment at BYU–Idaho, I began my studies as a graduate student at BYU. While working on my PhD at BYU, I taught undergraduate classes for the department of Instructional Psychology and Technology and also worked as an instructional design architect at the Center for Instructional Design, now named the Center for Teaching and Learning.

I completed a graduate degree in Instructional Technology at Utah State University and worked for a software company in Minnesota as an instructional designer. Finally, I am a lifelong active member of The Church of Jesus Christ of Latter-day Saints and devotedly believe in its doctrines.

Permission to conduct this study, with appropriate protections for human subjects, has been granted through the Institutional Review Board. The approval letter and the proposed participant consent form will be attached to the final report as appendices. The study used pseudonyms to mask the participants' identities: however, the study differentiated between student and instructor participants, a distinction that is important to the context of the cases.

Data Analysis

Hatch (2002) has defined data analysis as "a systematic search for meaning" (p. 148). To show evidence of validation and triangulation of the data, multiple forms of data were collected. Applying this general statement to the realm of gaining understanding using qualitative research, Hatch added "[data analysis] is a way to process [data] so that what has been learned can be communicated to others" (p. 148). Understanding what has been learned is a process that can be systematically accomplished by "consolidating, reducing, and interpreting what people have said and what the researcher has seen and read—it is the process of making meaning" (Merriam, 1998, p. 178).

The general sequence of events went as outlined. First the results of the survey were collected and examined. Using the results of the surveys, cases were identified and students were selected for interviews. Then the interviews were completed, transcribed, and reviewed. The researcher then accessed and analyzed any documents and content in the online course generated by the participants as part of the case activities to triangulate survey and interview data, as well as to deepen the understanding about the full experience during the *Teach One Another* learning activity. Finally, a cross-case comparison was completed to draw out any common traits across the cases and point out unique attributes from the cases.

During the Fall 2009 semester the researcher attempted a pilot test of the survey and interview guides. This allow for minor improvements to be made to the research methods and instruments before the beginning of the data collection for the full study. One of the changes made to the research methods was to sample the cases by sending out the survey to more than just four pre-sampled courses. During the pilot only the four pre-identified courses were sent the

survey, but none of the four courses had acceptable return rates and only one student agreed to be interviewed. The researcher went ahead and performed the interview to practice.

Therefore during the following semester, Winter 2010, the researcher sent surveys to 25 courses and sampled the cases based on the same characteristics from only those who had an acceptable return rate and at least seven students who were willing to be interviewed.

Survey analysis. The survey data serve three purposes for the study and were analyzed separately for each purpose. First, as detailed in the Interview Sampling section above, the student survey data served as a sampling instrument in selecting the students to interview.

Second, the data from the survey were analyzed with descriptive statistics within each case. The researcher looked for response means that were outside of the norm and wrote supplemental follow-up questions for use when interviewing the students involved in each case. This allowed the researcher to probe deeper within each case into something specifically identified from the broad data of the whole class.

Finally, the survey data were analyzed across the cases by looking for similar and unique trends in the descriptive statistic sets. This comparison was used in conjunction with the other data analysis techniques to elaborate on the student's experiences in the *Teach One Another* activities.

Qualitative analysis. Data analysis, especially in qualitative studies, can become an overwhelming and inexhaustible procedure. Merriam (1998) has stated that "analysis begins with the first interview, the first observation, the first document read" (1998, p. 151). The researcher adhered to the following prescribed analysis procedures and techniques to guide his actions.

There are many varying methods for data analysis in a qualitative case study. Patton (1990) stated the purpose of data analysis in case studies "is to facilitate the search for patterns

and themes within a particular setting or across cases" (p. 384). The researcher used a constant comparative method (Lincoln & Guba, 1985). As data were continuously collected, the researcher categorized it into any new or existing themes. These themes were then noted and referenced with any previously collected data.

There were two types of qualitative data: interviews and document reviews. The interview data were analyzed by following this outlined procedure. First, the transcribed interviews were imported into the qualitative analysis application Nvivo 7. Next, as the researcher read the interviews, he identified passages and began coding the themes and patterns. The researcher made notes on anything interesting during the analysis process, including adding new codes to be used during the analysis. Periodically throughout the process the set of identified codes was revisited, and when appropriate, codes were combined or consolidated. The researcher made several passes reading, coding, and recoding the data as new data were acquired and new insights uncovered. Data from the document reviews were scanned for additional information to inform the narrative and the results of the survey.

The themes identified from the interviews were used to elaborate on and illustrate the results of the surveys for each case. The document review data was used to triangulate and inform the data from the interviews and surveys. The information from the document reviews also provided a personal voice and rich detail to each case narrative in the final report. All data sources were used to find examples and ideas for writing the case narratives that are described in the Individual Case Analysis section below.

This study will use two levels of case analysis: individual case analyses and cross-case comparison. It is common for studies with multiple cases to include both a case analysis and

cross-case comparison. Patton (1990) notes that using both analysis strategies "requires writing a case analysis using all the data for each [case] before doing cross-case analysis" (p. 376).

Individual case analysis. A case analysis and report was first completed for each case independently. Although the surveys and interviews were collected during the same time period, the researcher coded and wrote the narrative first draft for each case separately. The researcher adhered to case analysis process formulated by Patton (1990, p. 388) and summarized in three steps in Table 3. As noted in Table 3, it is optional to include Step 2—to construct a case record. Patton (1990) further notes on this topic "In many studies, the researcher will work directly from the raw data in case files to write the final case study" (p. 387). In this study the researcher did not construct a case record, choosing to work directly from the case files and analysis notes to construct the narrative.

Table 3
Case Analysis Process

Step 1:	*Assemble the raw case data.* These data consist of all the information collected about the program for which a case study is to be written.
Step 2: (optional)	*Construct a case record.* This is a condensation of the raw case data.
Step 3:	*Write a case study narrative.* The case study is a readable, descriptive picture of the program making accessible to the reader all the information available to understand the program. The case study is presented either chronologically or thematically.

Producing a descriptive narrative for readers is a fundamental type of analysis in qualitative research. All the data collected from the interview, document reviews, and researcher's notes were organized by case. The data from each case were treated independent of

the other cases, as the case analysis was prepared. “Each case study in a report stands alone, allowing the reader to understand the case as a unique, holistic entity. At a later point in analysis it is possible to compare and contrast cases, but initially each case must be represented and understood as an idiosyncratic manifestation of the phenomenon of interest” (Patton, 1990, p. 387).

Cross-case comparison. Comparison is a search for similarity and difference in cases (Stake, 2006). Furthermore, Stake advises the intent of a multi-case study is not to “make some grand comparison,” but rather to gain better understanding of the phenomenon to be studied (2006, p. 83). To complete the comparison between cases, the researcher compared the descriptive statistics for each of the student survey results and searched for any interesting differences or similarities between the results. Additionally, the researcher compared the themes and patterns found in the qualitative analysis of each case to identify similarities and differences between the cases. Each analysis of the individual cases could stand alone, but the case comparison will allow for inferences to be drawn from the similarities and differences identified across the cases. “Cross-case searching tactics enhance the probability that the investigators will capture the novel findings that may exist in the data” (Eisenhardt, 1989).

Establishment of Trustworthiness

Case study research demands a rigorous standard in order to achieve a high level of trustworthiness. This standard of trustworthiness can be established by employing the following four criteria as part of the research study: credibility, dependability, confirmability and transferability (Guba & Lincoln, 1989; Lincoln & Guba, 1985).

Credibility. A study that is credible is believable and authentic to the participants as well as the readers of the study. Several techniques are available to assist researchers in meeting these

standards of credibility. This study used five techniques suggested by Guba and Lincoln (1989) to enhance the credibility of the research: persistent observation, peer debriefing, negative case analysis, progressive subjectivity, and member checking. Each technique used in this study to develop credibility is addressed below.

Persistent observation. To facilitate the technique of persistent observation the researcher employed a participant sampling strategy that attempted to include a broad spectrum of perspectives. The researcher was well situated to have a privileged connection to the cases in the study.

Peer debriefing. The researcher identified two individuals with whom to hold peer-debriefing sessions to review the study. Peer debriefing can enhance the study by giving the researcher an additional perspective so the accounts can resonate with people other than the researcher (J. W. Creswell, 2003, p. 196). Also, because this research study is a dissertation, the researcher's committee members, especially the chair, will serve as debriefers. The two other identified peer debriefers are from BYU–Idaho, Peter Williams and Daren Olson. Dr. Peter Williams directs the operation and administration of the online courses at BYU–Idaho and is intimately acquainted with the course designs using *Teach One Another* principles. Dr. Daren Olson recently came to BYU–Idaho and has the ability to ask questions from an outside perspective. Both Daren Olson and Peter Williams have instructional design research experience.

Negative case analysis. In performing a negative case analysis technique, the researcher specifically considered situations in the cases that did not fit within an identified or expected pattern. As suggested by Patton (1990, p. 463), the researcher included a section in the report that explores alternative explanations and considerations to the negative or deviant characteristics identified.

In studies that include multiple cases, such as this one, a cross case comparison can provide insight to reveal any information that shows differences or unique traits in the findings of each case. This study has four separate cases and includes a case comparison analysis specifically to look for differences and similarities across the cases.

Progressive subjectivity. Progressive subjectivity is the process of monitoring the researcher's own expanding views. To attend to this technique, the researcher recorded his thoughts and expectations prior to engaging with some of the participants. The researcher also shared his notes with the identified peer debriefers. The researcher also reviewed sections of the analysis chapters with members of his dissertation committee at least twice prior to the completion of this report.

Member checking. Member checking is a procedure where interview participants are provided a copy of a report draft that contains the information they provided during the interview. The participant is then asked to review the material for any errors. Concerning this technique of trustworthiness, Stake has stated, "all of my reports have been improved by member checking" (Stake, 1995, p. 116). Each participant who was interviewed was sent a copy of the transcript of their interview for them to review for accuracy. This allowed the participants to give input to the researcher about how the participant's experience was represented in the case report. The researcher received reply messages from three participants, one instructor and two students. The instructor did not have any suggestions for adjustment, but the students both replied with some minor changes to the text of their remarks. These updated transcripts were used in the analysis of this study. All three expressed their gratitude for having the opportunity to participate in the process of this study.

Dependability. The consistency of the processes used by the researcher applies to the dependability of a study. A recorded audit trail tracked the general activities of the researcher. The audit trail, study reports, and any other notes were kept to make available to the committee for review to determine how closely the researcher adhered to standards of credibility. The results of studies become more dependable as researchers demonstrate and record their steady and consistent inquiry process (Williams, n.d.).

Confirmability. The confirmability criterion refers to the quality of the findings in a study. Showing how information provided by study participants, events, and other resources contribute to the findings strengthens the quality of the findings in a study. All of the materials from this study, including the research notes are available to verify that the data and interpretations made by the inquirer are supported by material.

Transferability. The criterion of transferability refers to the ability to apply the findings of one study to the situation and context of the reader of the study. Alone the researcher cannot determine whether findings can be transferred into another setting. The author of a qualitative report has an important role in enabling transferability, but transferability requires an informed reader. Only the reader can decide if the situations are similar and congruent enough to permit transferability. The author fulfills his or her duty of enabling transferability by detailing the time and context of the study (Williams, n.d.). Lincoln and Guba (1985) have stated that "The case report is ideal for providing the 'thick description' thought to be so essential for enabling transferability in judgments" (p. 214).

ENG 335 Case Findings

The ENG 335 course is titled *American Literature: Realism and Modern.* Students study literary works, authors, events, ideas, and trends from the Realist and Modern periods. There were 29 students enrolled in the Winter 2010 course. Eighteen students completed the survey (62%), and seven students agreed to be interviewed. All seven were invited to schedule an interview time, and six interviews were conducted. The instructor of the course was also interviewed. The *Teach One Another* activities from Week Four were used as the case for this study from the ENG 335 online course.

The *Teach One Another* activity in this case has the class discussing two different topics from the 1927 American novel *Death Comes for the Archbishop* by Willa Cather. There were three discussion forums that the students were required to participate in during the week for at least sixty minutes of their study time. Two discussion topics were organized into two separate threaded discussion forums that are linked to the lesson material in the I-Learn course. For one of the discussions the students were organized into groups of five. Each group was given a different topic about the "Themes and Symbols" used in the book. The other discussion topic was about "Living a Fulfilling Life," and was conducted as a full class discussion. For the third discussion forum, the students were asked to participate in discussion threads led by three student moderators. Each week three different student were tasked with being moderators of a discussion thread where they identified a topic of interest to them that relates to the lesson materials and facilitated the discussion during the week.

Narrative

The narrative for this case is written from the perspective of a student. It is a compilation of parts of comments and experiences from each of the different students in this case, pulled

together into a single narrative. In an effort to improve the readability and flow of the narrative, the researcher took some liberty to adjust the exact comments from students. Information used to draft the narrative comes from the interviews as well as the documents, discussions, and activity instructions posted to the online course. The narrative begins in the next paragraph.

Each Monday morning I like to log in to I-Learn to check out the new reading materials and assignments that we will be doing during the week. This week only has one reading, "Death Comes for the Archbishop," by Willa Cather. The reading list is posted on the syllabus so we know what is coming and we can get a head start on the reading if we want to. I then notice that there are three different lessons that this week is broken down into. The first lesson covers the Prologue through book three, and has a group discussion activity that is on themes and symbols. The next lesson is about the seven deadly sins and holy virtues, only has an individual assignment, and covers books four through six. The last lesson covers books seven through nine and is about living a fulfilling life, and has a class discussion forum to participate in. In addition to the group and class discussions in the lessons, there is also the weekly "Questions for Your Classmates" discussion forum where three students are assigned to moderate a discussion on the topic of their choice that relates to the materials this week. This week just happens to be my week to be a moderator, so I really got a head start and have already read through the material to be prepared for all the discussions. This week I will need to stay involved with all three *Teach One Another* discussions, and keep a close eye on the discussion thread that I am moderating.

Even though we are only required to spend a minimum of one hour participating in the discussion boards each week, I always spend more than a couple of hours, sometimes more. This week I will probably be spending more time in the discussion boards than other weeks, because I will be checking the discussions every day—especially the one that I am a moderator for. I know

there are many people in the class that just put in their sixty minutes to get their full points, but I enjoy the discussions so much. The discussions each week enhance my learning and give me new insights into thinking about what we are studying in different ways. They also let me connect with other students and they are fun.

I like to finish all of the other assignments and read through all of the other information from the instructor about the reading materials before I post to any of the discussions. That way I am the most prepared. I also like to read through any of the other student posts to the discussion board before I post my own, that way I am not saying something that someone has already said. While I am reading through the other student's posts, if I read something that is interesting or that I have similar or contradicting thought about, I click on the "Reply" button and add my thoughts to a post on the thread. There was one time when a student replied to one of my posts and she said that she was just saying something in her post because she was required to reply to two other posts. I thought "How sad," because I learn so much from what the others in the class say and to me this is so much fun. I get to read what other people are thinking, and it helps me to learn and change my own thinking—not only in this class but my thinking about my community, my children, and my church.

Below is an example of a discussion exchange I had with my group this week. Our group had these instructions, "Your assignment is to examine the wooden parrot discussed through pages 81-87. Why would Cather include all of the information about parrots and the very old wooden parrot? What purpose is this section serving? What themes could these parrots possibly be contributing to?"

Post #1, Student A—We see on page 85 why the priest keeps parrots—to please his parishioners so he can control them. Cather gives us insight into the relationship between

the parishioners and the priest; there isn't an emotional but a business connection. The white people want to control the Indians and they do this by making them submissive or by bribing them; in this case, bribery. Father Jesus isn't trying to gain respect, love, or loyalty by being their friend but as a business partner. Everyone gets what they want—the priest gets control and status while the Indians get nice feathers for their own religious ceremonies.

As for the wooden parrot, Cather is again showing us the relationship between the Indians and the white Catholics: "the wings and tail and neck feathers were just indicated by the tool, and thinly painted. He was surprised to feel how light it was; the surface had the whiteness and velvety smoothness of very old wood. Though scarcely carved at all, merely smoothed into shape, it was strangely lifelike; a wooden pattern of parrots" (86, emphasis added). Here we can see what the missionaries have been doing with the Indians the entire time they have dealt with them. The white men are trying to "shape" the Indians into something else, in [*sic*] a "parrot", who will mimic the white religious society. The Indians allow this shaping, only to an extent and therefore they are "merely smoothed into shape", acting in the same pattern, seemingly realistic, yet still completely as they were before, hidden under a thin coat of paint. The priests are happy when their Indians follow them yet cannot see that there is no loyalty. The Indians are merely putting on a show acting as the parrots they are desired to be.

We cannot make others be what we want them to. We can teach them our knowledge but it is their choice to become who they will become. Throughout the history of mankind, we see this story of one group of individuals who believe themselves to be better than

another and try to force them to submit; usually this method only scratches the surface of changing a group of people.

Post #2, Student B reply to Post #1—[Student A], Your first paragraph was very insightful and made me think a different way. The fact that he was only about business with his people is interesting, and that he used them to control people. I can see the symbolism in that.

Post #3, Student C reply to Post #1—You make several interesting points. I am not sure I understand what you are saying about the wooden parrot. Do you think previous missionaries carved it? Father Jesus says, "That, your Grace, is probably the oldest thing in the pueblo—older than the pueblo itself." I thought it was a gift to Father Jesus or perhaps inherited from a prior Father who received it as a gift. I find your perspective interesting. I would not have thought of it in this way. Please clarify if I am incorrect in assuming your position.

Post #4, Student A reply to Post #3—Sorry if I confused you. I'm saying the Indians are similar to wooden parrot—they "act" like Catholics and white people, but are not truly "converted," like we see how the bird is barely carved, thinly painted. On page 87, Father Jesus explains where the wooden parrot came from: "His wooden bird he had bought from an old man who was much indebted to him, and who was about to die without descendants. Father Jesus had had his eye upon the bird for years. The Indian told him that his ancestors, generations ago, had brought it with them from the mother pueblo. The priest fondly believed that itw as [*sic*] a portrait, done from life, of one of those rare birds that in ancient times were carried up alive, all the long trail of tropics." So pretty much Father Jesus doesn't care about the significance the wooden parrot holds,

he just wants it to say that it's his; he made a trade with a dying man who owed him debts to get what he wanted. I hope that claifies [*sic*] my position; if not, ask me again! :)

Post #5, Student C reply to Post #4 – Ooooh...makes a lot of sense! Good job. I enjoyed reading your clarification. Very insightful.

In my role this week as moderator, I am required to add my thought questions to the "Questions for Your Classmates" discussion board before midnight on Tuesday night. The questions that you ask really take a lot of thought because they need to be in-depth enough to sustain a weeklong discussion. I really like the student moderated discussions because most of the students really take charge of their discussion thread and you get to know your classmates that you don't see, but you still make a bond with them. I get my discussion thread started on Monday afternoon with the following post:

In good literature, a journey is generally about more than simply going from point A to point B. No matter what the stated purpose of the journey is, when a character travels he is often on a quest for self-knowledge. In Death Comes For The Archbishop, there are several journeys. Choose one of them and explain what the traveler learns or becomes as a result of his journey.

Throughout the week I was excited to watch all of the responses be posted to my thread. I tried to stay involved with the discussions. At the end of the week there were a total of 17 different students who posted 48 total posts. Here is an example thread that was part of the discussion this week:

Student #1 response—Vaillant and Latour's journey in which they first met Magdalena was quite the learning experience. As they approached the home and interacted with Magdalena's husband, they felt uneasy and weren't certain about their decision to stay

there. When Magdalena warned them of the danger that was there if they remained, they learned to trust her. I think that they gained more understanding for the different dynamics of the people within the area that they had charge over. So often, they had interacted with native people that were typically giving and generous. This man was nothing like anyone they had met with thus far.

Moderator reply to Student #1—I agree that this was a very different experience. I thought Madelena was brave to warn them. I also think this was the only time that Latour or Vaillant did anything close to being violent when the Bishop drew his pistol. Here was pure evil and they were going to fight it. I also was thinking about Magdalena's journey away from Buck. Do you think there was something symbolic about that?

Student #2 reply to Student #1—I know. I kind of think it shook their world a little bit and made them stop and think. It was all part of the learning process and added depth to their chracter [*sic*] to learn about and deal with a person like Scales.

There is usually a group of students who like to get the discussions going early in the week, and during the whole week there is a good discussion happening on all of the discussion boards. But the most posting always happens the last couple days of the week on Friday and Saturday. Some of the posts are really long, a lot are quite short. Also, a lot of the posts will quote something from the reading material to backup their idea or to give some context about what they are trying to say. Some of the personal responses can become very tangential and take the discussion in a new direction. So that is also the role of the student moderators, if it is their discussion board, to bring the discussion back to what should be discussed.

I also really enjoy when the instructor posts to the discussions, which does not happen enough. It is always very insightful when she adds her perspective to what the class is saying. It would be great if she would post more in the discussion boards.

Thematic Analysis

The researcher conducted this thematic analysis following the procedures outlined in the Methodology section above. This procedure included coding all of the interviews in this case looking for patterns and themes that emerged. These coded passages were then categorized into related sections that are reported below.

The thematic analysis for this case has three sections: (a) Peers help deepen learning, (b) Thoughtful discussion, and (c) Moderating encourages responsibility. Each of these sections has a description and includes some passages from the interviews with students.

Peers help deepen learning. Students suggested that as they interacted with each other through the online discussion boards, the perspectives of others helped give more depth to their learning of the materials. Tami shared this about her experience:

> Each week there are usually two, maybe three, discussion boards. We kind of critique each other, or disagree with each other, or say “I didn't notice that, thanks for pointing that out.” It really helps deepen your understanding of what you’re supposed to get out of it, and things that maybe you are missing, and helping each other to learn.

This sentiment echoes the responses from the student survey, where this case scored the highest on the question asking if the *Teach One Another* activities—in this case the online discussion boards—helped to deepen your learning of the lesson materials during the week.

Kendra suggested that the process of articulating a discussion post, and then discussing it with others has given her opportunities to think and learn at deeper levels:

> The discussion board makes you go back, interpret the text, and then you put out your opinion. And then someone else could have a completely different interpretation of the text. So you can see that, and you can analyze your interpretation more [to see] if it's as on as you thought it was going to be. Or it might be more skewed, and so you can make comments on other peoples' [posts]. And by having that conversation, you have a more valid interpretation of the text than just your initial reading.

When asked why she felt this *Teach One Another* activity was important, Tami stated simply and plainly "it really helps you to be a deeper thinker." Rebecca added her perspective on how another's meaningful comment contributes to her learning:

> My favorite thing is when somebody says something, or makes an intelligent comment where it kind of opens or turned on a light for me. And I think 'Oh, that story had even more meaning or more depth or you know more interest than I even realized.' And you can get so much out of a story, but when somebody else shares a different perspective it just broadens it. Every time somebody adds to that it just makes it more meaningful. Each layer that you get deeper it makes it better. You can do so much by yourself, but to have more people doing it always adds to it.

Students shared their experiences with how their peers influenced their learning during the *Teach One Another* activity. Providing students learning opportunities that deepen their learning is part of what *Teach One Another* and Reciprocal Peer Learning are trying to accomplish. This theme also emphasizes the idea suggested by Gong (2002) that as individuals become responsible for their own learning and contribute to the learning of others, they learn as much as they are capable.

Discussions are thoughtful. Having a discussion online is different than having a discussion in a classroom. Some of the students in this case suggested that a couple of possible advantages to having discussions online are that every student can have an opportunity to contribute to the discussion, and that the students have time to thoughtfully prepare and review their contributions to the discussion before submitting it. This ability to carefully consider a contribution may encourage some students to participate in a discussion if they felt less confident having to articulate their ideas in a more ad hoc, quick moving, live classroom format.

Tami suggested several ways that she feels the online discussions give her confidence to participate:

> I think that if you were in a regular classroom setting you would miss that there isn't the time to engage like there is in this kind of setting. Plus, I think that when you are sitting at your computer, you're feeling safe and protected that you can engage a little bit more. You are feeling a little bit more confident because there isn't someone right there in your face critiquing you. And you are not studying their face, with their reaction to what you are doing and you're feeling. You are a bit more free to express [yourself].

The idea that having a discussion online has some different opportunities than having a discussion in a classroom was also something that Rebecca shared her perspective on:

> I really like [the online discussion boards]. I think it works really well, and in fact, in some ways I do enjoy being in the classroom, there's some things about that I really like. But in some ways this has an advantage over even a classroom discussion, because you have leisure to think about your comments, and there's not a limit on what you say, and you can think it through, you can edit. If you get in a classroom somebody says something interesting, you may or may not think of something to respond to that for ten

or fifteen minutes later, and then the discussion has moved on, and you're not going to say anything about it or you may. For somebody like me, I'm very introverted, and so I may have a comment. But with this it's a very safe environment to do that. And I have time to think through what I want to say. And so in some ways it encourages that participation even more.

Rebecca also suggested that she strives to be thoughtful in her discussion posts because she wants her peers' approval as well as to help keep the discussion interesting:

It encourages you to want to be thoughtful in your responses, because you know that other people are going to be reading them. And because that makes the discussion more interesting…. You want to make it meaningful. You want to look for things that that are going to make it worth reading and worth other people's time…. You don't want to get on there and just write anything. You're writing to other students. And especially for the ones who take it seriously, you want to make valuable comments. You don't want to just get on there and say 'I liked the poem,' or whatever you want to actually contribute something.

Others in the class do not have the same internal initiative to impress their peers or post meaningful responses to the discussion. Tami shared an experience that she had reading through the discussion and identifying one of these students, "for example, today I was reading a post that someone had written, and she said that 'I am only responding on this because I have to.'" Tami then continued by sharing her reaction to reading this student's response:

I thought "how sad," because you are missing out on so much. And there is so much fun here. I don't understand why you aren't taking the opportunity to enjoy it and grow from it. I have learned a ton. It has really, really enhanced my learning, not only that, it is also

> [changed] the way I approach other things in my life. I can see a practical application in so many other areas.

Still, there are some students who find participating on the discussion boards a less than desirable learning activity. This passage from Emma shows her struggle as she both recognizes that she has learned from some of the discussion posts, but also points out that she expected an online course that would allow her to complete her homework independently:

> The sole purpose of choosing an online class is because I'm home and working, and yet I still want to get some credit for school. And so during the week I don't really have a lot of time to go online and answer questions. That is really just busy work for me. And a lot of them end up being interesting, and you tend to learn a lot. But we're required to comment on other student's [posts], whatever they've written. It just kind of seems like a waste of time doing this, because some people just write it out as fast as they can and it doesn't benefit me reading what they wrote. To me it just kind of tends to be busy work and a waste of time. I don't know maybe some people get more out of it than I do.

The theme of thoughtful discussions gives evidence of the student's consideration of their peers, contributing to the *Teach One Another* idea of treating others with respect. There was also the motivation to contribute something valuable to the group, which may be another way of saying that students had a positive desire to edify and lift their peers as they learned.

Moderating encourages responsibility. While interviewing for this case, a student named Rebecca mentioned that she was in the role of a student moderator for the week. "This particular week I'm the moderator, so I've been a lot more involved with it than I am even normally." The researcher took the opportunity to have her expound on her experience as moderator:

> Well for one I'm on there a lot more often. I mean, I usually get on there and I'll read some of the responses. But since I'm moderating, I read all the responses. And I contribute a lot more to it. Probably in part because I don't feel like I'm saying too much, but also because I feel a bit of responsibility. And its kind of fun because then I got to pick the subject matter, and so I'm definitely invested in what we're talking about. So that kind of makes it interesting.

Another statement she made about her frequency of checking the discussion boards she was moderating, "I just like to get on there because I enjoy it, and because I like the discussion. I get on there probably once a day for the rest of the week, usually once I've done all the readings, so usually like Wednesday, Thursday, Friday or something I'll get on there once a day." When students were asked to act as a moderator they were given a position of responsibility. This responsibility was an extrinsic form of responsibility, and although effective in encouraging some students to be active, only a few in the class could moderate at a time so it had limited impact.

Instructor Perspective

During an interview with the instructor teaching this course, there were a few items of interest to the researcher about the case. The instructor was asked to respond to the questions by considering the student experience in the class, as opposed to their own experience as the instructor.

***Teach One Another* activity is necessary.** The instructor felt that the *Teach One Another* activities were a necessary part of the lessons each week. She felt that if the students did not have the opportunities to discuss their ideas and struggle through the thought questions, that the quality of the assessment essays that they submitted throughout the course would not be as good.

She also liked that participation was a mandatory part of the learning activities (by giving points for participation), because it allowed more students to participate in the discussions that would be able to in a regular classroom setting.

Students took the assignment seriously. The instructor noted that she felt that students seemed to put more thought into writing their posts to the online discussions, because they realized that their post would be permanently available for another person to refer back to. She also commented that the students put additional extra work into their online interactions by regularly using outside sources or conducting Internet research to include as part of their response or initial posting to the discussion boards for the *Teach One Another* activity.

Instructor learned from the students. The instructor also felt that she was learning quite a bit from the students and the discussion boards. She even commented that "I am not so sure my contribution is as valuable as the peer contribution," which shows that she felt that the students were having significant and substantial discussions. The students, ironically, mentioned a desire to see more posts from their instructor.

Survey Information

The survey was sent to all students in the class. The primary use of the survey was as a sampling instrument for the cases and student interviews. Additionally, the survey gave a broader sense of the class experience than the interviews. Five survey questions were identified as the most relevant to this study in regard to informing student attitudes and behavior in the case (see Table 4). The same five questions are presented in all of the four case findings. For the full results of the ENG 335 student survey see Appendix F.

The survey results indicate that 89% of the respondents felt the interactions with their peers deepened their learning. Thirty-nine percent of the respondents indicated that the *Teach*

One Another activity was more influential or the most influential activity to their learning. Looking at these two survey results together, they seem to indicate a connection between the influence of peer interaction to deepen learning, and students' perception of the activity as influential toward learning. Both of these results were the highest across all four of the cases.

Table 4
ENG 335 Selected Survey Data (N=18)

Question Four: Did the *Teach One Another* activity contribute to your learning of the lesson/unit topic?	
%	Answer
17%	Yes, it contributed a lot to my learning of the topic
72%	Yes, it contributed a little to my learning of the topic
11%	No, it did not contribute to my learning of the topic
Question Five: Compared to the other activities in the lesson, was the *Teach One Another* activity more or less influential to your learning?	
%	Answer
11%	The *Teach One Another* activity was the most influential part of my learning of the lesson topic
28%	The *Teach One Another* activity was more influential than some, but not all, of the other activities
39%	The *Teach One Another* activity was equally influential to the other activities to my learning
22%	The *Teach One Another* activity was not influential to my learning of the lesson topic
Question Seven: Did the interactions with your peers deepen your learning of the lesson topic?	
%	Answer
22%	The interactions with my peers deepened my learning a lot
67%	The interactions with my peers deepened my learning a little
11%	The interactions with my peers did not deepen my learning
Question Eight: How confident are you that your contributions to the *Teach One Another* activity influenced your peers in their learning of the lesson topic?	
%	Answer
17%	I am very confident that my contributions helped deepen my peers learning
67%	I am a little confident that my contributions helped deepen my peers learning
17%	I am not very confident that my contributions helped deepen my peers learning
Question Nine: Would you consider the *Teach One Another* activity an enjoyable learning experience?	
%	Answer
28%	Yes, I enjoyed the Teach One Another activity very much
50%	Yes, I enjoyed the Teach One Another activity a little
22%	No, I did not enjoy the Teach One Another activity

FDMAT 108 Case Findings

The course for FDMAT 108 is titled *Math for the Real World*. There were 55 students enrolled in this online course, and 34 completed the student survey (62% response rate). Of the 34 survey responses, 16 students were willing to be interviewed. This was the only case where the researcher took only a sample of students to schedule an interview with. The researcher followed the student interview sampling procedures outlined in the Methodology chapter above. The key features of the sampling technique are that the researcher tried to identify students on both sides of the spectrum of their experience, positive and negative. The researcher invited eight students to schedule and interview, four from the positive side and four from the less positive side. Five students were ultimately interviewed about their experience, three students from the lower/negative half and two from the higher/positive half.

The topics covered during this case, which occurred during week five, include loan payments, credit cards, and mortgages. The *Teach One Another* activity for this case is named Team Homework. The Team Homework is estimated to take the students about 60 minutes to complete during the week. The students were arranged into groups of four or five, and asked to find a meeting time toward the end of the week (Wednesday through Saturday) to hold an online, synchronous discussion. The students are given a homework sheet that has several questions that they work through during their Team Homework online meeting. The homework sheet for the case this week had twelve questions. The team then submitted their collective solutions for the problems to the instructor. A group leader submitted an evaluation assessment to the instructor that scored each group member's participation in the Team Homework assignment.

None of the students in the interviews mentioned the grading or evaluation on the Team Homework. The Team Homework was submitted on the same wiki that was setup for each group

to use. The group leader was tasked with making sure that the group's collective, final answers to each problem are posted clearly for the instructor to evaluate in the wiki. The group leader was also tasked with filling out a peer assessment spreadsheet after the *Teach One Another* activity was completed and submitted. To complete the peer assessment the group leader lists all of the group member's names, including their own, and gives them a score from 0 to 15. Included in the worksheet file is a scoring rubric to help guide the group leader in assigning an appropriate participation score.

Narrative

The narrative for this case is written from the perspective of a student. It is a compilation of parts of comments and experiences from each of the different students in this case, pulled together into a single narrative. In an effort to improve the readability and flow of the narrative, the researcher took some liberty to adjust the exact comments from students. Information for the narrative comes from the student interviews, course documents, online discussions, and the activity instructions that were posted to the online course. The narrative begins in the next paragraph.

Typically on Monday morning I look at what assignments are part of the class for this week. Once I get into the class on I-Learn and open up the new folder for this week, there is a nice table that lists all of the activities that are due in the class and when their deadlines are. So far every week has had some kind of a Team Homework assignment, and it looks like this week there is one that is the same as the previous ones.

Our group has anytime from Wednesday through Saturday to meet, and a group leader for this week is supposed to email everyone in the group with at least three different options for times to meet at the end of the week. I have heard that there are some groups in the class that

meet at the same time every week, and I wish that my group would agree to do that so that we do not have to worry about the time every week. It can be difficult to find a time when everyone can meet, some of us work full-time and some are in different time zones. For example, last week it was Friday before I heard from my group leader about any meeting times. Each week the group leader role rotates to a different student in the group.

Once we schedule our group meeting time, I know that I have to be prepared for the meeting by working through all of the problems before our meeting time. The Team Homework problems are in a wiki. My group likes to go have everyone answer all the questions on their own before we meet, and record them in the wiki with a unique color so that we can see everyone's answers. I like to get my answers to the Team Homework posted early, so that people know I did the work and participated. We also have lots of other homework to complete on our own, and this individual homework usually helps prepares me to complete the Team Homework.

When it is time for my group meeting, I get into the online class and click on the link for the Group Online Discussion. This opens in a new window and uses Adobe Connect. Adobe Connect is a bit frustrating because my group does not know how to use all of the features, like audio, video, and uploading files because those just end up messing up the meeting. I know another group in the class has started exploring other technologies to meet together, and they like to use Skype instead of Adobe Connect. It is nice that the link to Adobe Connect is right in the class and it is easy to load and get into, but it is frustrating to not be using all of the features. So far all my group uses to interact is the text chat, but it seems to be doing the job fine so far.

During the meeting the group leader takes charge, and we usually work through the homework problems one at a time. Since everyone has already posted their answers to all of the problems in the wiki using their color, we can quickly see who has different answers. We spend

time discussing any problems that have different answers and decide which answer works. Before we move on to the next problem, we make sure that the one who put the wrong answer understands what they did wrong and is able to make the corrections. We have to submit a unified answer for the whole team, so everyone has to agree on the same answer for every problem. Sometimes we have to work through a problem step-by-step, and explain each step to the group, and that can get tricky using the text chat window. When it gets too tricky, we have tried to use the shared whiteboard to draw out the problems and try to show our work. However, drawing equations with a mouse doesn't look that good on the whiteboard. I wish I had some kind of a tablet to write more effectively on the whiteboard.

The team homework time is really wonderful because if anybody has any questions about how to do anything, one of us will know how to do it and can explain the process of how to solve it. The team homework also helps me be prepared for the tests. Some of the questions on the tests have been similar to the ones that are on the Team Homework assignments.

Thematic Analysis

The thematic analysis carried out by the researcher on the FDMAT 108 case revealed evidence for the following themes: preparation helps learning, no accountability is frustrating, social appeal, importance of response difference, preparation impact, and teaching others reinforces learning. Each of these themes is described in this section and includes sample quotes from the student interviews.

The word *Prepare* is a specific term that is part of the learning culture at BYU–Idaho. *Prepare* is also one of the three defined parts of the BYU–Idaho Learning Model process, along with *Teach One Another* and *Ponder/Prove*. This research study is specifically dealing with the

Teach One Another part of the BYU–Idaho Learning Model, however what students do to *Prepare* for the peer learning activity is also of importance.

The students in this case expressed an extended insight into the role of preparation in the success or failure of the *Teach One Another* activity. The following two sections, preparation helps learning and no accountability is frustrating, highlight both the positive outcomes of students being prepared to interact with one another in a learning interaction, and then the frustrations of students who do not feel a motivation or accountability to their peers or the group learning activity.

Preparation helps learning. Students were keen to observe that their preparation not only helped them learn the materials better, but also gave them a sense of satisfaction that they could help another learn. Cami expressed her thoughts in this way:

> It's just really fulfilling to help other people. I know that I always feel glad when other people can help me with things. And so it's very reassuring to be in a group with other people that are on the same level as I am, where sometimes they help me, and sometimes I help them. It's very humbling to participate in that – to be prepared to help other people, and then also being prepared to accept help from other people.

Elaine talked about why preparation was important to her:

> I feel responsible that I have to go prepared; that I have to have already done the homework, and that I come with questions, or I come with some kind of knowledge of what the lesson was about so that I can either contribute or that I can get answers to things I didn't understand.

Elaine also shared her experience with those in her group that includes a couple of consistently unprepared students:

> Some people are prepared every week, you can always count on [them]. I guess it is just like anything else in life, once you figure out people you know who is going to be prepared, who is going to be there on time, who is going to be there consistently, and what you can count on people for. So it is good that the groups aren't any smaller than they are because there are two people in our group that consistently don't come prepared and don't contribute. So it's good that there is at least three of us who do come prepared and who do participate.

Sam also commented that the lack of preparation from other students was discouraging and difficult:

> When you get to the meeting and nobody's prepared it just ends up being a waste of time you know the meetings go way longer than they're suppose to go it just ends up creating more of a headache than it is worth so the homework itself is great but just the way we have to meet and getting that many people to line up that frequently that is no small task.

Sam also considered a best-case scenario: "I think that if everyone did come prepared, I think the meetings would go more smoothly and … would contribute more to the learning process."

Students recognized that coming to the *Teach One Another* activity having completed the assignments that are preparatory provides the peer groups the greatest opportunity for success. Preparation can be connected to the idea of taking responsibility for your own learning in the Reciprocal Peer Learning and *Teach One Another* frameworks.

No accountability is frustrating. In contrast to the section just above on how prepared students can have a positive *Teach One Another* activity experience, this section shares some of the many comments from students about their frustration with other students who were not

prepared. Sam observed others in his group who unapologetically admitted they were unprepared, “not to sound like a jerk but they have no problem showing up and saying oh I didn't do anything and so that is where I think a lot of the issue comes from that a lot of the students don't really take responsibility.” Sam continued, “there are obviously provisions set up to encourage accountability but there are still some students who just don't mind not doing anything.” He later expounded on the provisions for accountability that he mentioned earlier:

> There is a group leader that rotates every week and if you are the group leader that week you fill out a self evaluation and a peer evaluation and you give your classmates points based on how well they participated so I think that is obviously meant to hold people responsible but it doesn't seem to be that effective like I said people are just fine showing up to a meeting or not showing up at all and saying yeah I didn't show up because I didn't do anything.

To improve accountability, Sam suggested that there be more grading emphasis put on the group participation:

> You don't want to hose your other classmates because you were lazy or whatever. It is real easy to say ‘I'm just not going to go the meeting,’ or whatever. But in reality if your score affected their score directly, I think it would encourage a lot more participation.

Cami also shared that the feelings of not being prepared are a motivation for her to want to be prepared:

> I know it always really sucks to disappoint the group showing up unprepared to one of the group meetings you really feel like a tag-a-long attempting to catch up to what every one else is doing everyone else seems to know what they are doing because they're all prepared and you kind of feel like you let them down because your not prepared it kind of

> adds a little to this peer pressure to do your own personal learning process it kind of adds a little incentive to actually go learn these things for myself so that way I can actually help other people learn them.

Students shared several experiences in this section where they or one of their classmates chose not to be prepared for the *Teach One Another* activity. This behavior exhibited feelings of frustration in the students: disappointment, frustration, name calling, and accusations of laziness.

Social interactions are appealing. When asked in what ways the *Teach One Another* activity was appealing, Cami replied (in part):

> I think mostly the group interaction. The fact that we can help each other out. I can work through the problems knowing that if I don't understand something, somebody in our group probably understands it. So eventually we will get it figured out. It provides a sense of security in that way…. Mostly I just like the interaction with people.

Elaine also enjoys being able have others to communicate with. “It's nice to talk to the different people in the class.” “It's just nice because you have someone going through the same thing you are that you can talk to and get insight and help with.” She continued, “It helps because you are by yourself and it gives you a place where you can go and talk to other people about the assignment and get their opinion and glean from their knowledge.” Sam shares his feelings of satisfaction that are part of working with his group:

> There have been a few times when I have been able to help people learn, and that always feels really good. I really like doing that. You feel like you actually did something. You feel like you contributed. And that is always a good feeling.

Sarah had an opposite point of view on the *Teach One Another* activity—she despised it by saying, “It’s horrible.” Another quip of hers came when she was asked how she would

improve the activity: “get rid of it.” She continued, “With a math class I personally don't think that me working with a group is going to help me that much.” Later she further explained her negative position on this activity:

> I personally don't like it cause … I learn by myself. If I have a question, I will ask. I don't have to rely on others to help me. I just think it's a hassle. I don't like group projects because of the way things are graded with groups. If I do my part of the work I want to get credit for it. I don't want [the group work] to affect my portion of [my grade].

Though the activity was not appealing to one student, others had a positive, good feeling when they have witnessed that their own efforts helped a peer learn. The BYU–Idaho Learning Model and *Teach One Another* have spiritual features that provide some insight. While the students did not say they were having a spiritual experience, their good feelings may have been similar to how they would describe a spiritual feeling.

Response difference is important. In this math skills course, most of the answers are either correct or incorrect. Some of the students the researcher visited with have come to value when there is a difference in the responses that each group member submits. Elaine explains it this way:

> There have been several times where we have come up with different answers. Sometimes it's a simple math error, and sometimes it's using the wrong formula, or whatever. So I think it's actually more helpful when you do have different answers, because then you have to look through [the problem], and figure out which one of you did it right, and what formula was the right one to work…. If everybody has all the same answers, and everything is correct, then there is nothing to learn. But if people are [brave enough] to post their answers, even though they might be different than somebody else's

> answers, I think that is where the learning comes in. Because then you have to re-examine it, and find out what is the correct way to do this, what is the correct answer. And then you are able to learn something.

This is a very interesting idea to the researcher, that group interaction may be most productive when the individuals have differing answers. There may be a connection to the concept of "cognitive conflict," or disequilibrium, from the work in child development of Piaget (1965). Cognitive conflict inspires discussion that allows participants an opportunity to explain their point of view. The premise of differing answers gives the students something meaningful to discuss and work out, and also introduces an opportunity for peers to teach each other.

Nora also mentioned that sometimes you have to defend your answer to the group, "you have to defend your work sometimes. Like, you know, this is the reason why I feel that my answer is the correct one—when everybody else has varying different [answers]."

Teaching others reinforces learning. Several students in this case voiced how this *Teach One Another* activity gave them an opportunity to reinforce their learning. The process of having to revisit, in front of your peers, how and why you gave the answer you did to a problem, had a solidification effect for many students. Cami said:

> It just helps solidify it in your mind when you have to take something that you have learned and try and rephrase it so that the other people understand where you are coming from teaching other people so that they can also learn is really what, it solidifies that in your mind.

Elaine also shared this perspective:

> I enjoy helping [other students] out. When you work through it with them, it even increases your knowledge to help you understand it even better. After you have done

things repeatedly, or after you have told somebody something, then it also helps you. Working it through once you get it, but then working through it a second time and explaining it to someone increases your knowledge, as well as helps them out.

Nora commented on how teaching others is a mutually beneficial learning outcome of the *Teach One Another* activity. “You're able to look at the problem, and you're sending your answer to everybody else in addition to teaching them how to do it. And so you're reinforcing everything that you've already learned. So it’s nice.”

Instructor Perspective

The instructor for the FDMAT 108 course was the only face-to-face interview. He lives in another state, but happened to be visiting campus for a professional development summit for faculty during the days the researcher was scheduling interviews. This interview was the longest of the recorded interviews.

There were three topics that the instructor talked about that the researcher identified as adding some meaningful information about how the instructor perceived the student experience. The first topic shows the instructor’s concern that over several weeks of working together, the group interactions become routine and less meaningful. So the instructor feels a need to remix the group membership. The second topic discusses the instructor’s perception that there is a difference in student performance depending on the order that the students complete their assigned learning activities. The third topic is a concern that the instructor shared about students cheating in the online course.

Quality attrition of group interactions over time. Organizing the groups was a significant topic of discussion by the FDMAT 108 instructor. He first shared how he sets up the groups at the beginning of the semester:

> I set the teams up and usually I leave that to chance, I just randomize it, hoping that in that fate of fates there is an expert in all areas in that group, so there's somebody that can help lead them through. Sometimes I get real lucky and sometimes I don't.

The instructor has taught this online course for BYU–Idaho for a couple of semesters and has started to identify patterns in motivation during different times of the semester.

> When they go in at first the first part of the semester, probably the first four weeks of it, they're really good about working together. They get in there, they schedule a time, they're using e-mail, they use Skype, and they use Adobe Connect. They're just all gung-ho about it. And then right about the end of week four, into week five, they start thinking, "you know, we can just post to the wiki and comment on each other's things they are doing. And then we can maybe let someone do the initial post." I start seeing a lot of I agrees and dittos in that wiki post, where the participation becomes a little more like riding on someone else's coattails.

The instructor's solution to the decrease in student motivation to interact in their groups is to re-structure the groups. "I'm going to have to mix it up again so that they have to re-learn who's the strength. And I think that's probably the key with the team *Teach One Another* is never let there be one 'teacher,' at least that's what I'm finding in there." By one "teacher" the instructor is suggesting that a group that allows one person to do all of the "teaching" in the *Teach One Another* activity, it allows the other students to coast through by having that one motivated student to the majority of the group work.

Instructional sequencing. The instructor also discussed how he has observed a difference in student performance depending on if the student is coming into the *Teach One Another* activity fully prepared by completing their individual assignments:

> What I find is the ones that will do the quiz and the homework first, before the group, do a lot better….I've watched as students go through and do the homework, then the quiz, and then the teamwork. They do quite a bit better, and much more substantial conversations [are] taking place. This other [unprepared type of student] is just saying "well let's just get the quiz done and over with, its only five points and we're done." So they just rush through it, and then they work on the team assignment. And they go through all the convoluted discussions taking place there. And then they try to do the homework, and it doesn't click for them. And so I think the flow is important.

Academic integrity and answer siphoning. During this interview was the only time the researcher saw or heard anything about student cheating. The comments by this instructor do, however, underscore a concern that is not unique to online courses—and that is students who are dishonest in completing their coursework. This instructor shared his concern that because of the consistent weekly structure of activities, that the students could identify an opportunity to plagiarize the work of others in the class.

> [Students] may not know the nature of what the team project is going to be, but they do know its coming. And so they do know that if they're struggling a bit, if they wait until eleven o'clock Saturday night, they can jump in there and find most of the answers they need if they sort through the discussion boards and the wikis and the blogs. They can find what they need to get them by. And that's kind of a challenge because you want to leave [the activities and discussions] open so they can learn from each other, but you also want them somewhat accountable. And that is a real challenge.

The ideas shared by the instructor of this case do not all directly relate to a student's experience in the course. These themes do have some valuable ideas to consider and contemplate

as course designers are developing an online class. The first theme of quality attrition may be valuable to further investigate to see if there is any other corroborating information.

Survey Information

The survey was sent to all students in the class. The primary use of the survey was as a sampling instrument for the cases and student interviews. Additionally, the survey gave a broader sense of the class experience than the interviews. Five survey questions were identified as the most relevant to this study in regard to informing student attitudes and behavior in the case (see Table 5). The same five questions are presented in all of the four case findings. For the full results of the FDMAT 108 student survey see Appendix G.

The survey results indicate that 94% of the respondents felt the *Teach One Another* activity contributed to their learning. Eighty-eight percent of the respondents felt confident that their contributions helped deepen their peers' learning. Both of these results were the highest across all four of the cases. The connection between these results is that students have greater confidence in their own ability to deepen the learning of their peers, when also acknowledge the *Teach One Another* as contributing to their own learning.

Table 5
FDMAT 108 Selected Survey Data (N=34)

Question Four: Did the *Teach One Another* activity contribute to your learning of the lesson/unit topic?	
%	Answer
35%	Yes, it contributed a lot to my learning of the topic
59%	Yes, it contributed a little to my learning of the topic
6%	No, it did not contribute to my learning of the topic
Question Five: Compared to the other activities in the lesson, was the *Teach One Another* activity more or less influential to your learning?	
%	Answer
0%	The *Teach One Another* activity was the most influential part of my learning of the lesson topic
21%	The *Teach One Another* activity was more influential than some, but not all, of the other activities
65%	The *Teach One Another* activity was equally influential to the other activities to my learning
15%	The *Teach One Another* activity was not influential to my learning of the lesson topic
Question Seven: Did the interactions with your peers deepen your learning of the lesson topic?	
%	Answer
9%	The interactions with my peers deepened my learning a lot
76%	The interactions with my peers deepened my learning a little
15%	The interactions with my peers did not deepen my learning
Question Eight: How confident are you that your contributions to the *Teach One Another* activity influenced your peers in their learning of the lesson topic?	
%	Answer
29%	I am very confident that my contributions helped deepen my peers learning
59%	I am a little confident that my contributions helped deepen my peers learning
12%	I am not very confident that my contributions helped deepen my peers learning
Question Nine: Would you consider the *Teach One Another* activity an enjoyable learning experience?	
%	Answer
21%	Yes, I enjoyed the Teach One Another activity very much
56%	Yes, I enjoyed the Teach One Another activity a little
24%	No, I did not enjoy the Teach One Another activity

FDREL 211 Case Findings

The FDREL 211 course is a religion course focused on topics in the New Testament found in the Bible. In this online course, there were 40 students enrolled during the Winter 2010 semester. Twenty of the 40 students completed the survey, and seven of them selected that they would be willing to participate in an interview. The researcher extended an invitation to all seven students to arrange a time for an interview, and was able to schedule and complete four student interviews.

The *Teach One Another* activity in the FDREL 211 course was a small group assignment. The students were given individual preparation tasks to complete before meeting together in an online meeting space to discuss and complete the group assignment. The preparation tasks had the students respond to several questions to a "private" blog so that the students only see their own postings. Before the group meetings are scheduled, between Thursday and Saturday, the blog becomes "public" so that all of the other group members can review one another's posts. After reviewing everyone's posts the group meets together in an online meeting space, at the same time, to review and work through the group assignment.

The students in each group rotate through the role of group leader. Each group leader is responsible for setting up a time for the synchronous group meeting toward the end of the week, facilitating the group meeting, turning in the group assignment, and then submitting an evaluation of the participation of each group member. The research for this case focuses on Week 5. There were two topics covered during this week, the institution of the sacrament and the Savior's suffering in the Garden of Gethsemane.

Narrative

The narrative for this case is written from the perspective of a student. It is a compilation of parts of comments and experiences from each of the different students in this case, pulled together into a single narrative. In an effort to improve the readability and flow of the narrative, the researcher took some liberty to adjust the exact comments from students. Information comes from the interviews as well as the documents, discussions, and activity instructions posted to the online course were all used to draft the narrative. The narrative starts in the next paragraph.

There are a couple of things that happen, or are supposed to happen, every Monday in my online New Testament class. First of all, the new lesson materials for this week open up and we can go into the class to find what we chapters we are reading and what questions we need to be thinking about and answering. The other thing that should happen each Monday is that I should be getting an email from my group leader that proposes a few different times for us to meet online together at the end of the week. Our group usually meets at the same time every week on Thursday afternoon, but sometimes someone has a conflict and we try to find another time that works for everyone.

I first log in to my email on Monday morning to see if this week's group leader has sent out the meeting time message. Last week was my turn to be the group leader, and the leader responsibilities rotate to someone different each week. I got the message from my group leader, and she is hoping we can all meet at the same time again this week. It is really much more convenient to find the same time each week that we can all meet, instead of trying to find a new time every week. I see that one other person in my group has already said they are available at the same time on Thursday afternoon this week, and I send a message to the group saying that the same time on Thursday works for me as well.

Next I log in to I-Learn, which is where the online course lives, to see what is in the new folder of learning materials for this week. When I click on the "Week 5" folder, I see that it is similar to how the previous weeks are setup—two reading assignments in the New Testament with quizzes, two journals to answer questions, two student choice assignments, two preparation activities for the group assignment, and then the group assignment instructions. As I scan through this week's materials, I notice the two topics that we will be studying, the institution of the sacrament and the Savior's suffering in the Garden of Gethsemane.

I know I have until Thursday at noon to complete the reading and post my individual answers to the questions on the group blog. There are two sets of preparation questions this week; each set has three questions that ask about specific things from the readings. For the group assignment we will be discussing question #3 from both sets of the preparation questions. During the first part of the week, the group blog is a "private" blog, so that no one can see anyone else's answers. Then at 12:00 noon on Thursday, the group blog become "public" so that everyone in the group can see each other's answers. Because my group likes to meet on Thursday afternoons, we have also worked out to send our answers to the group questions in an email to the group leader by Wednesday so that the group leader can compile them all together and send them out before we meet to have time to read through everyone else's answers.

At our scheduled group meeting time on Thursday afternoon, I first get into the online class and find the link to the online meeting space, which uses Adobe Connect. When Adobe Connect loads, you can see your name on the list with the others in my group that are already in the meeting. We have only used the text chat box to communicate, because using the audio and video tools are too complicated. There are three of us in my group, so once we are all in the meeting, the group leader takes control and posts what everyone sent her and then asks questions

about it that we need to decide on together. We have to keep our posts brief because it is in a chat room, but we try to expound on what we meant in our individual answers. We all have a different approach and style to answering the questions, but by the end of our meeting we have all collaborated together and our group answers are all very complimentary when they come together. Our group meetings usually last between half an hour and a full hour.

After the meeting is over, the group leader is in charge of posting our group's answers to the official assignment blog for the class before Saturday night at 9:00pm. I like to go on the assignment blog to make sure our assignment is turned in, and also to see the responses that the other groups post. The group leader also fills out a participation assessment worksheet that has a rubric in it. The group leader lists all of the group member's names, including their own, and gives each a participation score from 0 to 25. The group leader can also add any notes or comments next to the score to let the instructor know why they gave each score.

Thematic Analysis

This section outlines the findings of the thematic analysis that was done to reveal any prominent themes from the data collection. Each of the themes are labeled and described in section below, and include example passages from the data.

Motivation to prepare. The group assignment seemed to be a motivating factor for students to learn and be prepared to contribute to the group interaction. Here are a few of the comments that contributed to this theme. Nikki felt a sense of motivation because others were counting on her:

> Especially where it is just three people, if I'm not contributing it's very obvious. And if I haven't read the assignments or done the assignments, very obvious. And I can see the obvious fact that I didn't complete my work before so I couldn't contribute anything.

> That's really what motivates me to do a better job on things, and a more complete job, knowing that people depend on me for discussion.

Katie also had something to say about her motivation to be prepared:

> I think being prepared to discuss in a group setting, you know, none of us wants to be the one that didn't show up or didn't do their part or isn't prepared to answer a question or hasn't thought about the topic…. In a group setting where someone is sort of counting on me to have already developed an opinion on it, I feel like if I haven't developed that opinion, then I'm not contributing. I really don't want to be that one.

This theme gives insight into how students feel motivated to be prepared for their *Teach One Another* learning activity. This motivation comes from an inner desire to not be someone who is found unprepared. This idea has raised these questions: Is this type of feeling an intrinsic feeling—because the students are motivated from within to help those that are depending on them? Or, is this an extrinsic feeling—because there is external social pressure to complete the activity? This dilemma is discussed further in the Discussion chapter of this study.

Different perspectives deepen learning. All four of the students interviewed mentioned that they felt the *Teach One Another* group assignment had a deepening effect on their learning of the topics each week. The students attributed their deeper understanding to the diverse perspectives that are shared in the group interactions. Here are a few of the comments from the students. Nikki said, “I think it’s really helpful because you get a deeper insight on things that you might not have understood or realized individually just because there is other input from other students.” Rachael mentioned, “it’s nice to be able to work together and get other ideas. And in the end you share things that maybe you wouldn't have thought of before, and see things

in a different way." Katie shared her personal experience as someone who is not a member of the university's sponsor, The Church of Jesus Christ of Latter-day Saints:

> We each have definitely a different take on the same questions. It's just really interesting to see how each of us approaches it from a different angle…. Part of it is I'm not a member of the church. So I'm always enlightened by the responses that I hear. My answers tend to be…academic. I don't know how to describe it, but the other people on the team, there's a depth of understanding to it that comes from being long-time members of the church, that they bring to their responses. It just puts a whole different slant on it for me as a non-member.

Providing deep learning opportunities is an ideal that both the BYU–Idaho Learning Model and Reciprocal Peer Learning hope to achieve. This theme confirms the BYU–Idaho Learning Model assumption that students feel they learn more when they teach each other.

Developing trust in peers. Working with and learning from other students in an online course requires a certain level of trust to be successful. The students in this case talked about the role of trust and how it develops online. Nikki had much to say about developing trust in and friendships with her peers:

> Throughout the semester I've developed a friendship with them just through these simple hour conversations every week, and so it's very appealing in that sense…. I like small groups and where there's just, like, three of you talking, and it's not formally. I am more willing to share my more personal thoughts. I think there's a much better understanding of how things personally relate to us in our personal understanding when it's just a chat online with a small group…. Face to face would be nice, like, to develop a relationship, and to develop that trust. But who's to say if it would be better or worse to do it face to

face compared to online. It's just different, and I think online there has to be more immediate trust. You can't see them, and you're not going to see them, and so you just have to kind of immediately form that trust and that relationship.

Katie talked about how trust has developed over time:

> In the beginning maybe there was less contribution, shorter answers, less depth to it. But after one or two meetings we kind of all rose to the same level where people were expanding on their thoughts a little bit more.

Misty added, “even though I've never met the people in my group, we kind of feel like we know each other, and it helps to build that friendship.” Developing trust in your peers was something that took repetition and practice. As students had repeated opportunities to interact together, they commented that their trust in one another deepened their learning.

Instructor Perspective

All of the instructors of the online classes were interviewed as part of this study. At the beginning of the interview, the researcher informed the instructor to comment about their perception of the student experience—which is the focus of this study. By the nature of their position in the class, the instructor has a unique opportunity to identify trends in student behavior in the class.

The sections below outline four themes that were prominent in the interview with the instructor: (a) *Teach One Another* is crucial to learning success, (b) Technology problems, (c) Peer accountability eases instructor load, and (d) *Teach One Another* elicits student motivation. While the instructor was asked to focus on the student experience, it is inevitable that their own experience as the course instructor is woven into the responses. However, these themes are an

important perspective of the class and how the *Teach One Another* activity was experienced by students.

***Teach One Another* is crucial to learning success.** Early in the interview the instructor mentioned twice that he feels the *Teach One Another* is crucial to the students learning experience each week:

> I believe it's crucial…. I do believe that because it is an expectation to get together, and [the group assignment] allows them to interact with each other, I think its crucial. I don't want to do away with it at all…. I think that the ability to interact with each other is the key [to learning the material deeply]…. I think that it's the interaction with fellow students that is the important part and it's going to be different than a classroom but we can definitely generate collaborative work using different tools.

Technology problems. There have been several technical issues that the students have expressed about Adobe Connect that have affected the group activities. The technical issues seem to be around two separate issues. First, setting up the audio and video is complicated and so the groups have foregone using those features even though they would prefer to use them for their group meetings. The second issue is a derivative of the first because out of necessity the groups are using the text chat feature, but complain that the text chat area is too small on the screen. The instructor shared an interchange he had with a frustrated student. The student was dealing with technical issues when she attempted to collaborate with her group. The instructor asked the student a rhetorical question, if she were to "toss all of the technical problems out the window…are you getting something from [the *Teach One Another* activity]? How is it going?" The instructor continued by saying:

> She actually emailed me [back] and said that it lends to a depth of understanding that wouldn't be achieved individually. She has enjoyed how others' interpretations differ from her own. And that it allowed her to see something totally different so it's not just her and the instructor constantly. But it's her and others in the class really getting a third eye, if you will, and she's really enjoyed that. And so I think that's the benefit of it.

Peer accountability eases instructor load. Having students be accountable to their groups is also a way to ease the load on the instructor:

> By the time I deal with all of the grading and responsibilities I have, and focusing on some key students or questions that have come to me, and so forth, by the time I'm done dealing with that, there is no way that I could accomplish what the simple fact of having three eyes on one project can do. And so from an instructor's standpoint I think that it is crucial that they have eyes on each other because they bring a different flavor and accountability to the table as well as insight.

***Teach One Another* elicits student motivation.** The instructor also commented on how the group assignment drives motivation to learn and be prepared:

> This online course encourages self-education because they are the only ones that can answer those questions. They can't sit back and let everybody in the class raise their hand. Nobody sits to the side and gets left out. And so that's the benefit behind the whole online course overall. It's just an added element to show the commitment to the class, because it does take extra effort to get with somebody during the week between Thursday and Saturday where you have to correlate schedules. You have to be prepared to express your opinions. You have to have something that is already presentable, and then you have to work through things.

The instructor of this case shared his perspective that the *Teach One Another* activity is crucial to the success of the students in meeting the course objectives. From his perspective, the activity also provides students with additional motivation to complete all of their course activities. The instructor also acknowledged that there have been technology issues with the *Teach One Another* activities in some groups that have lessened the potential impact of the student's learning.

Survey Information

The survey was sent to all students in the class. The primary use of the survey was as a sampling instrument for the cases and student interviews. Additionally, the survey gave a broader sense of the class experience than the interviews. Five survey questions were identified as the most relevant to this study in regard to informing student attitudes and behavior in the case (see Table 6). The same five questions are presented in all of the four case findings. For the full results of the FDREL 211 student survey see Appendix H.

The survey results indicate that 30% of the respondents felt that the *Teach One Another* activity was not influential to their learning. Twenty-five percent of respondents were not very confident that their contributions helped deepen their peers' learning. Both of these results were the highest from the four cases. This is an interesting connection between the influence of the activity toward learning and confidence in the ability to help a peer learn. It is important to keep this negative data in context. While the percentages for these questions are the highest on the negative end, the data shows students responded mostly positive, with 70% and 75% respectively.

The higher percentage of negative student responses to these two questions in the survey for this case may be because of technology problems. The instructor reported that he knew of several students that were frustrated with the Adobe Connect group meeting tool and could not

get the technology to work appropriately. Some students who were interviewed said that for their positive group experiences it took time to develop trust and relationships with the other students. Some groups of students in this class may have not reached a point where they were interacting at a level where they could recognize that their interactions were positively contributing to their learning.

Table 6
FDREL 211 Selected Survey Data (N=20)

Question Four: Did the *Teach One Another* activity contribute to your learning of the lesson/unit topic?	
%	Answer
35%	Yes, it contributed a lot to my learning of the topic
45%	Yes, it contributed a little to my learning of the topic
20%	No, it did not contribute to my learning of the topic
Question Five: Compared to the other activities in the lesson, was the *Teach One Another* activity more or less influential to your learning?	
%	Answer
0%	The *Teach One Another* activity was the most influential part of my learning of the lesson topic
25%	The *Teach One Another* activity was more influential than some, but not all, of the other activities
45%	The *Teach One Another* activity was equally influential to the other activities to my learning
30%	The *Teach One Another* activity was not influential to my learning of the lesson topic
Question Seven: Did the interactions with your peers deepen your learning of the lesson topic?	
%	Answer
15%	The interactions with my peers deepened my learning a lot
55%	The interactions with my peers deepened my learning a little
30%	The interactions with my peers did not deepen my learning
Question Eight: How confident are you that your contributions to the *Teach One Another* activity influenced your peers in their learning of the lesson topic?	
%	Answer
15%	I am very confident that my contributions helped deepen my peers learning
60%	I am a little confident that my contributions helped deepen my peers learning
25%	I am not very confident that my contributions helped deepen my peers learning
Question Nine: Would you consider the *Teach One Another* activity an enjoyable learning experience?	
%	Answer
35%	Yes, I enjoyed the Teach One Another activity very much
30%	Yes, I enjoyed the Teach One Another activity a little
35%	No, I did not enjoy the Teach One Another activity

FDSCI 205 Case Findings

The following section reports the findings of the FDSCI 205 case. There were 42 students in the class and 28 who completed the survey for a response rate of 67%. From the 28 students who gave their consent in the survey, seven students marked that they would be willing to participate in a follow-up interview and all seven were invited to schedule an interview. The researcher was able to interview four students via a recorded telephone conversation, and another student who responded to the interview questions via email. The instructor of the course was also interviewed over a phone call.

The FDSCI 205 course was titled, Understanding DNA, and the study focused on student's experiences with the *Teach One Another* activity that is referred to as the "jigsaw." Elliot Aronson conceived of the jigsaw technique, and developed it during the late 1970s (Aronson, Blaney, Stephan, Sikes, & Snapp, 1978; Aronson & Bridgeman, 1979). This course implemented the basic principles of the classroom jigsaw activity into the online instruction. The basic structure the online FDSCI 205 jigsaw activity divided the students into two different groups, an expert group and a jigsaw group. The students started to work within their expert groups to develop learning materials on a specific topic. The students then separated into their jigsaw groups, which contained one "student expert" from each of the expert groups who could teach and answer questions about the specific topic they studied. In the jigsaw groups the students reviewed the learning materials from the other student "experts," and were encouraged to ask any questions about the topic that they had to the student expert. More specifics about the details of the jigsaw activity are in the student narrative below.

Narrative

The narrative for this case is written from the perspective of a student. It is a compilation of parts of comments and experiences from each of the different students in this case, pulled together into a single narrative. In an effort to improve the readability and flow of the narrative, the researcher took some liberty to adjust the exact comments from students. Information comes from the interviews as well as the documents, discussions, and activity instructions posted to the online course were all used to draft the narrative. The narrative begins in the next paragraph.

My FDSCI 205 course is made of weekly lessons that are hidden until each Monday morning when they are made available for the weekly study. This weekly pace keeps me focused on the same materials, and allows for groups to work together on assignments.

After I log in into the class, I click on the "Lessons" menu item, located on the left side of the class window, and I can see all of the available lessons. In this week's new lesson, the case has a *Teach One Another* activity named "Week 4—GENETIC IDENTITY—Genetics." After opening the folder for this week, I can see a description of the topic for the week and a list of objectives. Below this there are links to a variety of assignments and activities. The *Teach One Another* activity is found in two parts in two different sub-folders. These sub-folders are organized for the students to complete "Monday–Wednesday" and "Wednesday–Friday."

The first activity is labeled "Jigsaw Part 1—Personal Case Study" and is in the Monday–Wednesday folder. It instructs me to access my group wiki to create a case study with my group by following the attached instructions (see Appendix I to review the instructions). All of the students in my class are assigned into one of four groups that are all studying a different topic. These groups have about ten students in them. Each group is given a different gene, trait, and starting point. For example, my Group A was assigned to study the "CCR5" gene, "HIV

resistant" trait, and we were given a website and further instructions to get us started on the research to develop the case study. My group uses the wiki and a word processor to create and post the case studies for the jigsaw activity this week. This week has been a little different, because all of the other weeks we have created a PowerPoint presentation.

Once the activity opens up we go on and the whole group looks at the assignment and signs-up to take a part. There is a sense of urgency to access the group activity early because it is kind of first-come, first-serve. So if you are the first one there you choose the specific slide you want to make. Sometimes if all of the topics have already been called-for another student from my group will join me on my topic and we will work together. See Appendix I to review the instructions for the case preparation part of the activity. The instructions include the different sections that are to be included in the case study.

We are supposed to come together with our part of the learning. Once you have some information for your topic, you go to the wiki and post what you have worked on, your piece to the puzzle. Once it is all brought together, we put together a Word document with all the information on the things that we have learned from it so that the rest of the group members can learn what we learned as well. So you start posting pieces and then the next person who gets on, they will take the different pieces and they can try and put it together. And the next person that gets on they can take those pieces and try to put them together, or re-arrange it, or edit it, or add any other information that they have gotten. This way everyone in the group gets to collaborate by building of what we have all learned.

We use the wiki throughout the semester to collaborate with our groups, so there is a different page on the wiki for each lesson. We interact with each other on the wiki page in two different ways: a) by adding to, editing, deleting, or adjusting the content found on the wiki page,

and b) by adding comments to the page. We can also add comments to the wiki page that are listed at the bottom of the page, but do not change to information already added. Comments are used for several different purposes: to select a group leader, post ideas for the project, give out contact information like email addresses each other, report what changes we made to the page, or to give encouragement and positive feedback to each other.

We have until Wednesday at 9:00 p.m. to post the case study that our group created to our other group, our jigsaw groups. Inside the lesson area on I-Learn, the activity is labeled "Jigsaw Part II—Genetic Case Studies," and is found in the Wednesday–Friday folder and has instructions for me to go to my Jigsaw Group Discussion Board to post my group's case study file before Wednesday at 9:00pm, and then discuss it with the group. Our jigsaw groups are smaller, only four students, and each one in my group is a representative from one of the four larger groups. We all post our case study for the group to review and discuss. This way the information from all four groups is pulled into one group.

We are supposed to ask questions about the other topics, and also answer any questions or clarify my own topic for my group. I go on and comment on the other cases and ask questions or answer any questions that they asked about my case. The basic idea is that I share my case with the other members in my group, and they share each of theirs with me.

Our case is graded with a rubric that has three levels: a) were the concepts and facts presented in the case accurate, b) did we respond to all three of the other cases in our jigsaw group, and c) did we provide accurate feedback to all of the inquiries about our own case. This rubric covers both the case that we created, and our discussion of all of the cases. We have from Wednesday through Saturday to have our jigsaw group discussion about all of the cases, and then we start the next week with the same process with new topics all over again.

Thematic Analysis

This section outlines the findings of the thematic analysis that was done to reveal any patterns or themes from the data. Each of the themes are labeled and described in sections below, and include example passages from the data.

Responsibility for own learning and peers' learning. This theme includes evidences that showed the *Teach One Another* activity encouraged responsibility or motivated individuals to learn the material for themselves, and to help their peers learn. Dallin said, "People are depending on you and so I think it gives people a certain motivation to be involved because no one wants to be that person that is the one that didn't do their job." Nancy talked about taking responsibility for her own learning by stating, "[the jigsaw activity] gave me a chance to be in charge of my own learning." Robin mentioned something similar:

> The responsibility that you have is to learn your part so your can teach the rest of your group that part, or they don't know it for later on for the test or a quiz or something. It is a lot of responsibility on your shoulders. You have to get it done. You have to learn it. You have to really learn it, not just get by and learn it…. If I don't learn it, then I can't teach it. And if I can't teach it, then the rest of the group doesn't know it or they have to go look it up.

Melissa was more specific about being responsible for her peers to also learn the material when she said, "We are all responsible for each others' learning, and if you want to learn you are going to be an active participant in [the jigsaw activity]."

A statement that was less positive towards this theme came from Leo who stated, "I don't think [the jigsaw activity] is necessarily encouraging me to want to help any one. It is just another step in completing an assignment." While Leo still felt motivated to finish the work, this

Teach One Another activity was no more interesting than any other class assignment. Additionally, Robin talked about the lack of ambition that some students succumb to, “Some group members have really dropped the ball.” Andrea suggested some were only responsible for themselves:

> You get points if you help out. And if you don't help out, then you don't get the points for the assignment, even if your group gets it done. So you are really responsible for whatever points you are going to get, and therefore whatever learning you get from it.

Taking responsibility for learning is a common feature of both *Teach One Another* and Reciprocal Peer Learning. This section highlighted three different types of responsibility mentioned by students: (a) responsibility to peers, (b) responsibility for own learning, and (c) responsibility to complete the assignment.

Involvement. The theme of involvement highlights when the students talked about their opportunities to interact with one another and how they impacted their learning experiences. One area that demonstrated involvement was about the help that peers were to these students. Nancy talked about how her group helped her:

> Some students were much more active in the class and always helped with the projects. If I didn’t know an answer to one of the questions all I had to do was ask someone in my group, or post it in the assignment help discussion, and someone would be there to help me.

Dallin built upon this theme by mentioning:

> You don't get overwhelmed because you're just a part of it. I think it would be overwhelming to do the whole thing. I don't think you would learn as much and I don't think the presentation would be as good, because it’d only be one point of view. So I

> really like it that you get a different view and more information. And you don't get overwhelmed with it. You just have to do your part, and then you get to sit back and relax a little bit and learn from other people as well.

Dallin had several additional statements related to the idea that someone's learning is enhanced from the unique perspectives that peers can bring:

> I think that when you put different brains together from multiple different sources, people are going to pull out things that are important to them that you wouldn't see normally because it doesn't affect you in your life. [Other people will notice things] that you wouldn't have seen without that other person doing that portion of the project.

Dallin even expressed confidence that he had contributed meaningfully to his peers, "I am sure that there are lots of things that I put down that someone else might not of thought."

Andrea mentioned that sometimes the peer interactions could become intense, "we've had arguments through an online comment system." Leo talked about the consequences that the entire group suffered when a peer was not involved. "If someone doesn't do their part then everybody misses out on what that person was suppose to present." Robin had a similar sentiment, "some group members don't put forth as much effort." Interaction with others is a fundamental part of both *Teach One Another* and Reciprocal Peer Learning.

Appeal. Whether the *Teach One Another* activity was enjoyable to the students or not is outlined in this Appeal theme. The survey data indicated that of the four cases, the FDSCI 205 case had the lowest average for the question asking if this activity was an enjoyable activity. Dallin voiced some of his lack of appeal by specifying, "I don't necessarily look forward to it because you have to depend on other people and their schedules." Leo also voice frustration with working around scheduling issues, "I sometimes look upon the assignment with drudgery is

because I know it’s not always going to fit in with my schedule and I'm going to have to re-arrange and work around it.”

The angst expressed around scheduling was a bit puzzling to the researcher and was unexpected for this case because the activity had students interacting with asynchronous tools: threaded discussion boards and wikis. Thus the groups did not have to find a common time to meet together, they were able to work on the activity during their own available time. However, there was a strict mid-week deadline that the “expert groups” had to meet so that they had the last few days of the week to discuss all of the presentations with their “jigsaw group.” Therefore one possible explanation for the scheduling angst may be that students had mid-week due dates for their group work.

Even still, there were several comments in the interviews from the students that they did like this activity. Nancy said, “I enjoyed [the *Teach One Another* activity] because it wasn’t just sitting there and answering worksheets. It required us to work together and get to know each other. I really like the *Teach One Another* activities in this class.” Andrea contributed, “I like it because it doesn't require as much study time as it would for you to put all four presentations together.” In the end, Dallin gave his endorsement for the jigsaw activity:

> I think it is one of the better ones in my classes, how the jigsaw works, because you work together as a group but you still have your own individual portions…. I am kind of an advocate for this program. It seems to work really very well.

Robin added her reasons for why the online jigsaw activity was enjoyable:

> Part of the enjoyment comes at the very end of the finished product, because you work at it and you didn't have a teacher teach you about the materials. It is what you learned on your own, and through people your age, and friends. You come together and you have

this finalized project and you can look at it and say, “I learned this. I did it for myself. I put it together.” I think that is just great, and I feel really good about that.

The survey for this case shared an important perspective concerning appeal. Of the four cases in this study, this FDSCI 205 case had the greatest percentage of students who said they did not enjoy the *Teach One Another* activity—43%. The other three cases were: ENG 335 was 22%, FDMAT 108 was 24%, and FDREL 211 was 35%. Students who were interview shared both positive and negative perspectives.

Activity effectiveness. Robin referenced that learning in an online class with *Teach One Another* activities was different than other traditional learning activities. She said, “it's a different learning experience than just being taught by a teacher or reading it from a book.” Leo stated something similar:

> At school, if I go sit through a classroom and don't do any effort, I'll still get a pretty decent grade…. That it's probably more effective than what you call it normally, where the teacher presents to the class, where they just stand up and give their lesson, and you take notes, and go and study from that after having read the material. I think that the presentation and jigsaw group activity is more efficient than, I would say, a teacher's presentation on it.

The students acknowledged that learning in an online class was different from their experiences in a classroom. Knowing that some students felt that the activity was effective and efficient is valuable for BYU–Idaho.

Teaching as a learning technique. Leo shared a great summary of this theme, “we get the experience of teaching other people what we learned. And so we actually know what we presented on better than…we would if we didn't have the opportunity to present on it.” Leo

continued with another thought, “I think it's a great way to get to know [the learning material] quick, is to ask somebody who has just studied it, because they can communicate all of their hours of research to me really quickly.” Robin also contributed a thought to this theme, “it is people your age teaching you, or someone who's just like you; where they are learning things, but they're not really sure about—just like you are, but you can work together and figure things out.”

Teach One Another and the BYU–Idaho Learning Model are fundamentally grounded in the idea that you learn more when you teach. This section emphasizes this idea with comments from students who shared their own experience with the learning activity.

Deadlines. This jigsaw activity had two parts, which necessitated a mid-week deadline to keep the process moving. Dallin explained the setup in this way:

> The teacher wants it done by Wednesday. And then Wednesday through Friday the smaller groups, they kind of like, dissect each one of the presentations…. I really like that it has to be done on Wednesday, and then the Thursday and Friday you learn the rest of the information.

Leo mentioned the deadlines as well, “I have greatly benefited [by having deadlines], I like that the time frame that is allowed to prepare our presentations is only about two days.” The students appreciated having the deadlines in place for this activity because of the structure that it provides.

Content divide and compile strategy. The activity did not give specific instructions for student to chunk out the work and then bring the pieces back to create a single document, however that seemed to be the general rule for how the students decided to complete these activities. This strategy is explained in the following comments made by Robin:

> Your whole group looks at the assignment, and takes their part, and starts working on the different pieces…. What you do is you work with others in your group and you post what you have worked on, your piece to the puzzle.,,, We were all supposed to come to the table with our part of the learning. So we broke down the topic that we were supposed to be learning about…. [We] split it up between ourselves and looked through different things about our part of the topic, and then brought it together.

Dallin also had several statements about dividing out the work and then compiling it together:

> I like the point where you split up, because [when] you are going to learn something in-depth you can't learn everything…. It's kind of first-come, first-serve, so if you are the first one there, you choose the specific [topic] you want to make. And you tell the group that you're going to do that…. You just have to do your part, and then you get to sit back and relax a little bit, and learn from other people as well.

Leo summarized his feelings in this way, "I think [the jigsaw activity] is a great way to get to know [all the learning materials] quick—to ask somebody who has just studied it, because they can they can communicate all of their hours of research to me really quickly." Students migrated toward a strategy of dividing out the research for a project, and then combining their efforts into a single, group effort. The *Teach One Another* activity in this case seems to lend itself best to this type of student behavior, even though the instructions do not direct the students to work in this manner. This theme seems to have wide applicability in both the *Teach One Another* framework and the Reciprocal Peer Learning framework: students are responsible for both learning and teaching, students learn both from and with each other, students work together

with others who share a common goal, and students develop collaboration skills by working together.

Instructor Perspective

The sections below are the themes from the interview with the online course instructor for the FDSCI 205 course. The instructor was reminded at the beginning of the interview that this study was about the students' experiences in the course, and he was asked to respond to the questions with his perspective of the student's experience. It was difficult for the instructors to separate out their own experiences with the course and the *Teach One Another* activity, however the FDSCI instructor did a good job of keeping that perspective. The four topics discussed below from the instructor interview are: a) Early engagement with learning activity, b) Learning by teaching, c) Student ownership and investment, and d) Group setup after add/drop deadline.

Early engagement with the learning activity. The FDSCI 205 course was pretty involved. Many of the activities were really quite advanced for a foundation of science course that only had Science 101 as a prerequisite. Also, it pushed the students to do work early in the week because the group work started right away.

Learning by teaching. This activity gave the students a fuller experience. Instead of only learning one genetic disease, the student were able to meet within their jigsaw groups to expand what they learned from the other students who each studied a different disease. The instructor felt that, "You can always learn so much more teaching than you ever do as a learner. If you were presenting the material to teach it, you often would study so much more than what you actually present."

Student ownership and investment. Students feel a responsibility to do a good job with this learning activity because they know they have to take this presentation back to the jigsaw

group and teach it to the other students. They also feel ownership and investment in the presentation because they contribute to creating it. Another thought is that these jigsaw activities carry quite a weight toward the student's final grade.

Group setup after add/drop deadline. One caution when using a jigsaw activity in an online class is to wait until the third or fourth week before starting these group activities. Deferring until the course enrollments are more stable will save time organizing and reorganizing the groups.

Survey Information

The survey was sent to all students in the class. The primary use of the survey was as a sampling instrument for the cases and student interviews. Additionally, the survey gave a broader sense of the class experience than the interviews. Five survey questions were identified as the most relevant to this study in regard to informing student attitudes and behavior in the case (see Table 7). The same five questions are presented in all of the four case findings. For the full results of the FDSCI 205 student survey see Appendix J.

The survey results indicate that 37% of the respondents felt that the interactions with their peers did not deepen their learning. Forty-three percent of respondents did not enjoy the *Teach One Another* activity. Both of these results were the highest from the four cases. This indicates that there may be a connection between student enjoyment and whether the activity deepens their learning.

Table 7
FDSCI 205 Selected Survey Data (N=28)

Question Four: Did the *Teach One Another* activity contribute to your learning of the lesson/unit topic?	
%	Answer
25%	Yes, it contributed a lot to my learning of the topic
61%	Yes, it contributed a little to my learning of the topic
14%	No, it did not contribute to my learning of the topic
Question Five: Compared to the other activities in the lesson, was the *Teach One Another* activity more or less influential to your learning?	
%	Answer
4%	The *Teach One Another* activity was the most influential part of my learning of the lesson topic
18%	The *Teach One Another* activity was more influential than some, but not all, of the other activities
61%	The *Teach One Another* activity was equally influential to the other activities to my learning
18%	The *Teach One Another* activity was not influential to my learning of the lesson topic
Question Seven: Did the interactions with your peers deepen your learning of the lesson topic?	
%	Answer
4%	The interactions with my peers deepened my learning a lot
59%	The interactions with my peers deepened my learning a little
37%	The interactions with my peers did not deepen my learning
Question Eight: How confident are you that your contributions to the *Teach One Another* activity influenced your peers in their learning of the lesson topic?	
%	Answer
14%	I am very confident that my contributions helped deepen my peers learning
71%	I am a little confident that my contributions helped deepen my peers learning
14%	I am not very confident that my contributions helped deepen my peers learning
Question Nine: Would you consider the *Teach One Another* activity an enjoyable learning experience?	
%	Answer
11%	Yes, I enjoyed the Teach One Another activity very much
46%	Yes, I enjoyed the Teach One Another activity a little
43%	No, I did not enjoy the Teach One Another activity

Cross-Case Comparison

For this cross-case comparison, the researcher compared the themes from the data across all of the cases. To begin the researcher identified themes in all of the case analyses; each theme was numbered and each case was given a unique identifier. He then combined them together, grouping themes that were similar. These theme groups were then reviewed a second time to adjust or re-align them with similar themes.

Once all of the groups were completed, the researcher then organized them into broader themes. These broader themes show patterns across the cases of the different themes. This cross-case comparison identified three patterns of themes among the *Teach One Another* activities: (a) encourage accountability, (b) build trust, and (c) deepen learning. In addition to these three cross-case patterns, this chapter discusses the critical comments made by some students across all of the cases. The final section of this chapter compares the *Teach One Another* activities in the different cases.

Encourage Accountability

Learning accountability is a life skill that is valuable beyond any classroom or online course. Across all four of the cases in this study, students working on the *Teach One Another* activities expressed a greater sense of preparation and motivation to properly complete class work. One possible contribution to this finding is that they knew that they would be benefiting from the work of others and so they wanted to do their part. Additionally, a dread of the shame associated with a lack of preparedness and participation seemed to motivate some students into performing their group work.

Responsibility and motivation to prepare. Putting students into groups and giving them a learning activity that requires them to teach what they are learning to others in their group

seemed to instill in some students a responsibility and motivation to be prepared to teach. This could be a valuable strategy to use in any teaching situation. Students in three cases—FDMAT 108, FDSCI 205, FDREL 211—all commented on their feelings of responsibility or motivation to be prepared to contribute to and teach their groups. Elaine in the FDMAT 108 case simply stated, "I feel responsible that I have to go prepared." Robin, in the FDSCI 205 case, also mentioned the responsibility of being prepared to teach:

> The responsibility that you have is to learn your part so you can teach the rest of your group that part. It is a lot of responsibility on your shoulders…. If I don't learn it, then I can't teach it. And if I can't teach it, then the rest of the group doesn't know it or they have to go look it up.

Also in the FDSCI 205 case, Dallin shared that he is motivated because his group is relying on him: "People are depending on you and so I think it gives people a certain motivation to be involved." Melissa from the same case also added, "We are all responsible for each other's learning, and if you want to learn you are going to be an active participant." Being motivated because of group interdependence is also something that Nikki in the FDREL 211 case mentioned, "What really motivates me to do a better job on things, and a more complete job, is knowing that people depend on me." Nikki's statements that she was motivated to "do a better job" and "a more complete job" were important because they show that students are motivated to do their best work when working in a group of peers that depended on one another for success. All of these statements show how students feel motivated or a sense of responsibility to adequately prepare by doing their work before meeting with their peers.

Unmotivated students. Not all students felt motivated to come prepared for the *Teach One Another* activities. These unmotivated, unprepared students caused frustration within

learning groups. In the FDMAT 108 case, Sam commented that some students will join the synchronous group interaction unprepared, “They have no problem showing up and saying oh I didn't do anything.” When students were not prepared, it derailed the effectiveness of the *Teach One Another* activity. Sam also stated that, “When you get to the meeting and nobody's prepared it just ends up being a waste of time.” A similar phenomenon was observed in cases that had asynchronous peer interactions. In the ENG 335 case, Tami quoted something she recently read on a discussion board that demonstrated an unmotivated student, “I am only responding on this because I have to.” The student was willing to “show-up” on the discussion board by posting, but was doing it without being motivated.

There may be several reasons why students were willing to “show-up,” but still unwilling to put forth any real effort. One possibility was suggested by Emma who was also in the ENG 335 case, “I think most people are just commenting so they can get the points that are necessary.” While a grade or points can serve as motivation to complete the activity, they may do little for encouraging meaningful interaction and engagement. Some students may find their own motivation for contributing to the *Teach One Another* activity. In the FDSCI 205 case, Robin said that, “Some group members don’t put forth as much effort [as others].” There are learning consequences when all group members do not actively participate, as suggested by Leo also in the FDSCI 205 case, “If someone doesn’t do their part then everybody misses out on what that person was supposed to present.”

These consequences are more apparent in learning activities like the jigsaw activity in the FDSCI 205 class that rely on everyone bringing a different part of the content to the group. When an entire group relies on all of the individual students to get all of their learning content, one or more unmotivated students can affect their whole group. It may be wise for such activities

to have a strategy in place that plans for a redundant source of information when some students do not fulfill their part. Such a strategy would need to be sensitive to not remove accountability from the individual, as well as balanced so as not to penalize or overburden other students.

Unpreparedness shame. This theme comes from students who commented that they did not want to be embarrassed by being the only one who did not properly prepare to participate in the group interactions. This feeling was a motivating factor to encourage completion of the preparation activities and develop individual responsibility for student learning. Cami in the FDMAT 108 course made this clear:

> I know it always really sucks to disappoint the group showing up unprepared to one of the group meetings; you really feel like a tag-a-long attempting to catch up to what every one else is doing. Everyone else seems to know what they are doing because they're all prepared and you kind of feel like you let them down because you're not prepared. It kind of adds a little to this peer pressure to do your own personal learning process. It kind of adds a little incentive to actually go learn these things for myself so that way I can actually help other people learn them.

In a very similar tone, Katie from the FDREL 211 course shared her thoughts on what motivates her to be prepared:

> I think being prepared to discuss in a group setting, you know, none of us wants to be the one that didn't show up or didn't do their part or isn't prepared to answer a question or hasn't thought about the topic…. In a group setting where someone is sort of counting on me to have already developed an opinion on it, I feel like if I haven't developed that opinion, then I'm not contributing. I really don't want to be that one.

Online courses that include required *Teach One Another* activities appeared to encourage accountability in students when they feel that they did not want to let the other students in the group down. Additionally, students seemed to show a greater sense of motivation and responsibility to complete the preparation work so as to be prepared for the peer interaction.

Build Trust

The *Teach One Another* activities in these four cases give opportunities for students to develop skills in building a trust in learning relationship. When students come to rely and depend on one another through repeated interacts, they began to make connections and build trusting relationships. Building a trusting relationship with peers can be very important to students in online classes where feelings of isolation can be common. In the FDMAT 108 case, Cami simply stated, "I [like] the group interaction…. It provides a sense of security." Then in the FDREL 211 case, Nikki mentioned, "I've developed a friendship with them just through these simple hour conversations every week…. I am more willing to share my personal thoughts…. You just have to kind of immediately form that trust and that relationship."

When these students use words such as "security," "trust," and "relationship," it is apparent that they were comfortable with their peers and were able to connect with them at a certain level. Providing opportunities for students to develop these types of feelings could help students have a positive learning experience and also keep them engaged and motivated with the learning material.

Working together. Students acknowledged the necessity in the course to have to work together. This was part of the course design. In addition to the students describing the process of working together, they also discussed that it was necessary to work as a group. Nancy in the FDSCI 205 case said, "It required us to work together and get to know each other." In the

FDMAT 108 course the students submitted answers together as a group. So they needed to be unified with their answers, before they submitted their group assignment. A student in the FDREL 211 course, Katie, commented that, “It's just really interesting to see how each of us approaches it from a different angle, but it's all very complementary when it all comes together in the final document.”

Students developed unity as they worked together to complete course activities. For groups that were required to submit only one answer set for the group as a whole, the group developed trust in each other as they came to unified decisions for their assignments. Another type of group activity allowed the group members to divide the assignment work out and then compile their efforts into a single work. These activities built trust between group members as they relied on each other’s answers or information to contribute and combine with their own. As groups had regular practice working together on learning activities they built trusting relationships.

Learning with similar peers. Students also commented about recognizing that when their peers were in a similar situation it helped them build trusting learning relationships within their groups. They saw their peers on a similar level—taking the same online class as they were, and learning the same things. Cami in the FDMAT 108 case described her feelings as, “It’s reassuring to be in a group with other people that are on the same level as I am, where sometimes they help me, and sometimes I help them.” In the same case, Elaine shared her similar thoughts, “It’s just nice because you have someone going through the same thing you are that you can talk to and get insight and help with.”

In another case, the FDSCI 205 course, Robin talked about this idea as well “It is people your age teaching you, or someone who’s just like you; where they are learning things, but

they're not really sure about—just like you are, but you can work together and figure things out." Clearly to some students there was a level of comfort knowing that they could connect with peers in their groups because they were at a similar learning stage. Connecting with peers online had many challenges, however these students suggested that they recognized similarities with their peers and found this to be "nice" and "reassuring."

Learning activities that required groups of peers who were learning at the same level to work together appeared to be more successful when students built trusting relationships. This idea may also work the other way—as students at a similar level build trusting learning relationships within their group, they may have a greater potential for deeper learning success. As students at the same level repeatedly interacted with one another over time, their opportunity for significant learning potential became greater, and their learning became deeper.

Deepen Learning

When students were required to interact with one another it was hoped that there was some positive learning gained as part of the effort. Students in the ENG 335 and FDREL 211 cases commented that these activities deepened their learning of the material. From her experience in the ENG 335 case Tami said, "[The TOA] really helps deepen your understanding of what you're supposed to get out of [the reading assignment], and things that maybe you are missing, and helping each other to learn." Rebecca, also a student in the ENG 335 case, offered a similar perspective:

> My favorite thing is when somebody says something, or makes an intelligent comment where it kind of opens or turned on a light for me. And I think 'Oh, that story had even more meaning or more depth or you know more interest than I even realized.'

Sometimes it may take some time for peers to build a trusting relationship to the point where deeper learning can be achieved. This is explained in the comments made by Katie who is in the FDREL 211 case: “In the beginning maybe there was less contribution, shorter answers, less depth to it. But after one or two meetings…people were expanding on their thoughts a little bit more.” This phenomenon may be helpful to understand as these learning experiences were crafted for an online class; assignment expectations should reflect that deeper contributions to learning may need some time to develop within peer groups. This could have implications if the groups were shuffled around too frequently or if the groups were too large for the students to get to know one another. There may be opportunity to provide a learning activity as a catalyst for the groups early on to develop a connection and trust one another in hopes of helping them get to the deeper learning potential described by the students in this section.

Peers influence learning and thinking. As students posted what they were learning, and then read through what others have posted, they often recognized that the perspective of their peers was sometimes very different than their own. Recognizing these differences seemed to prompt some students to reconsider their own initial ideas. This was brought out by a couple of students in the ENG 335 case. First, Kendra described her experience with this phenomenon, “Someone else could have a completely different interpretation of the text…. So you can make comments on other peoples’ [posts]. And by having that conversation you have a more valid interpretation of the text than just your initial reading.” Also in the ENG 335 case, Rebecca shared her thoughts on this topic:

> You can get so much out of a story, but when somebody else shares a different perspective it just broadens it. Every time somebody adds to that it just makes it more meaningful. Each layer that you get deeper, it makes it better.

Each additional perspective contributed by students could add value to a learning activity. Dallin, who was a student in the FDSCI 205 case, provided a succinct way of showing how one should not only learn from others, but also contribute their own perspective to the dialogue: "You just have to do your part…and learn from other people as well." Group size should be considered when deciding how many student's perspectives are appropriate or too many. There may be a point of diminishing returns if students are required to read too many additional student perspectives. However, as students recognized that they were contributing to others' learning and that they themselves were learning from their peer's work, the quality of the contributions became deeper as they became more motivated to contribute meaningful material to the group activity.

Investment to do meaningful work. Students in the ENG 335 and FDSCI 205 cases shared a desire to contribute to their groups in a meaningful way. Rebecca shared her opinion about the ENG 335 *Teach One Another* activity:

> [It] encourages you to want to be thoughtful in your responses, because you know that other people are going to be reading them…. You want to make it meaningful…. You don't want to get on there and just write anything. You're writing to other students. And especially for the ones who take it seriously, you want to make valuable comments.

The instructor of the FDSCI 205 course also shared that the students "felt ownership and investment in the presentation because they contribute to creating it." These feelings of ownership and investment help meet the outcomes of an education at BYU–Idaho by developing responsibility to be a lifelong learner. This trait was exemplified in a statement by Nancy who was a student in the FDSCI 205 case: "[The TOA] gave me a chance to be in charge of my own learning." Staying invested in the learning activity in a meaningful way empowered students to

be active and see their own ideas develop in addition to feeling a sense of satisfaction that their meaningful efforts also influenced their peer's learning.

Differences are meaningful. The *Teach One Another* activity can be more meaningful when students come to the activity with different answers and perspectives on the problems or issues they are about to learn together. When students all shared the same opinion or the exact answer, then there was not much for the students to discuss together. Elaine from the FDMAT 108 case described her experience:

> I think it's actually more helpful when you do have different answers, because then you have to look through [the problem], and figure out which one of you did it right, and what formula was the right one to work.

The researcher found an intriguing juxtaposition in this theme—where the students feel it is helpful when differences are present, especially in a mathematics course where coming to the same solution to a problem is the desired end result. In the FDREL 211 case, where religion was the topic, Nikki also suggested that the ideas from others in her class helped her deepen her understanding, "I think [the TOA] is really helpful because you get a deeper insight on things that you might not have understood or realized individually, just because there is other input from other students." Having other students working through the same material appeared to give some students a sense of confidence in their learning of the subject material.

Dallin, who was in the FDSCI 205 case, commented in a similar fashion that different people all have had unique life experiences that add their own perspective to the group: "I think that when you put different brains together from multiple different sources, people are going to pull out things that are important to them that you wouldn't see normally because it doesn't affect

you in your life." These students suggested that the differences between people's answers or perspectives were valuable and helped them deepen their learning in their courses.

Learning by teaching. Giving students opportunities to teach what they are learning to another was a core element of the learning activities in these cases. Some students expressed comments about how these teaching activities also helped them learn the material better. In the FDSCI 205 case, Leo said, "We get the experience of teaching other people what we learned. And so we actually know what we [learned] better." Rachael in the FDREL 211 case added, "You share things that maybe you wouldn't have thought of before, and see things in a different way." In addition to the two statements above, there was a full section in the Thematic Analysis of the FDMAT 108 case in which Cami, Elaine, and Nora all commented on teaching as a learning process.

All of these statements suggested that the process of teaching or sharing what they had learned with someone else helped their own learning. By teaching one another, the students had to first prepare by studying, and then process what they were learning so that they could externalize it. A historical and philosophical reference to this principle of learning through teaching may also be found in the New Testament of the King James Bible, "Thou therefore which teachest another, teachest thou not thyself?" (Romans 2:21). This process of externalizing whatever it was the students were learning by teaching it to another, appeared to solidify the learning of the students.

Students in online courses may be able to deepen their learning as they externalize what they are learning by contributing meaningful work to a *Teach One Another* activity. A group could also build consensus within a learning assignment by teaching one another. Additionally,

as a group identified the differences between their responses, each unique perspective could provide additional insights and ideas to further deepen a student's learning.

Student Frustrations

Not all of the comments from students were positive. The student survey gave a broad perspective of some negative student attitudes toward the *Teach One Another* activities—31% of students in these four cases said the *Teach One Another* activities were not enjoyable. While frustration and lack of enjoyment are not exactly the same thing, this measure provides a broader perspective about student attitudes toward the activity than those perspectives provided by the interviews. By identifying areas where students expressed concerns or frustrations, course designers can then make specific targeted changes to the learning activity in an attempt to resolve students concerns. The two major areas of concern across cases had to do with technology frustrations and group schedule coordination.

Technology problems. The only participants who mentioned having technology issues were the ones that used synchronous tools in the FDREL 211 and FDMAT 108 cases. The technology problems for both cases seemed to be that the students were not all able to use the audio or video tools within Adobe Connect, and so they resorted to using the text-chat tool. Although the students seemed to get their work done in this way, there was a common sense of frustration that they could not get the audio and video media tools to work correctly.

This frustration led to a couple of noticeable side effects. The first was that the instructor had to spend time working through technical support for students, even though there was a dedicated staff in place to handle such situations. One instructor noted that he received several messages from students about their frustration with the technology not working to their satisfaction. Even though students were asked to contact a central helpdesk to work through their

technology issues, the students still felt a need to let their instructor know of their frustrations. This side effect created additional workload for both the instructor and the students involved which had a negative impact on their experience.

The second noticed side effect was that students started exploring their own technology tools to meet together as a group, instead of using those provided within the course. While this strategy was not discouraged in these particular online courses, the provided technology should not be frustrating to the point that some students chose to spend additional personal time and energy to find an alternative collaboration tools to complete their required group activities.

Scheduling issues. All of the online courses at Brigham Young University–Idaho are semester-based and have the students work together at the same pace through the course material in cohorts. Students should understand up-front that they cannot work ahead in the course and that they will interact with others students each week. Scheduling issues were shared in both of the synchronous activity cases where students, in small groups, find a time each week to meet together at in a virtual meeting space. In the FDMAT 105 case, Sam voiced his scheduling concern, “The way we have to meet and get that many people to line up that frequently that is no small task.” The other synchronous case, FDREL 211, the instructor shared his opinion about how it takes commitment from the students to organize their schedule, “It’s just an added element to show the commitment to the class, because it does take extra effort to get with somebody during the week between Thursday and Saturday where you have to correlate schedules.” A scheduling issue was also brought up in one of the asynchronous cases, FDSCI 205. In this case students had a midweek deadline on Wednesday to complete their topic research in their large groups, and then spend the latter half of the week interacting in their smaller jigsaw groups. Even through students were not required to meet at a specific time, Leo was still critical

of trying to fit two weekly deadlines for this assignment, “I sometimes look upon the assignment with drudgery because I know its not always going to fit in with my schedule and I'm going to have to re-arrange and work around it.” It may not be possible to please every student when it comes to scheduling. However, clearly informing students of what is expected from them each week could be an important instructional component to include in the beginning of the course.

Activity criticisms. In addition to the two major themes highlighted above, there were other remarks from students that were critical of their *Teach One Another* experience. Sarah in the FDMAT 108 case had an issue with being graded as a group, “I don’t like group projects because of the way things are graded with groups…. I don’t want [the group work] to affect my portion of [my grade].” This attitude appeared to come from students who perceived that their individual grade was negatively affected by their group scores.

Rather than identify any particular part of the *Teach One Another* activity, Emma in the ENG 335 case stated that she did not like it at all, “To me [the *Teach One Another* activity] just kind of tends to be busy work and a waste of time.” This study had only two students out of four classes that shared their opinion about not liking the entire activity. While these were not recurring themes from many students, it was prudent to acknowledge these critical perspectives.

Activity Designs

Identifying areas of concern to students provided opportunities for adjusting the learning activity for improvement. Each of the four cases in this study had a unique implementation of *Teach One Another* activities in the online course. Even so, some similar characteristics emerged across the cases. The sections below share comments by the study participants that were related to how the activity was designed.

Synchronous small groups. The synchronous and small groups cases, FDMAT 108 and FDREL 211, both were set up so that the students used the Adobe Connect® tool to communicate. Both cases had small groups that were made up of five or fewer students. Each week the groups needed to find a meeting time where they could all be online and in the same "virtual meeting room" using Adobe Connect to work on their group activity and assignment together. Prior to their group meetings, the groups interacted with one another using different tools—the groups in the FDMAT 108 case used a wiki tool and the groups in the FDREL 211 case used a blog tool. These other tools allowed the groups to prepare for the group meetings and share their work and ideas with each other.

Regular weekly meeting time. One particular theme that was specific to the synchronous cases was finding a time to meet together online as a group. Although the activity instructions for each week asked a student group leader to email their group with three possible times to meet during the week, students appeared to value having their group establish a regular meeting time for each week. Amy described how her group in the FDREL 211 course setup a regular time to meet each Thursday afternoon:

> The group leader is expected to email the other students in the group by Monday with three different times we could meet together as a group. Then we respond and decide which time that works for everyone so for my group we pretty much had the same time every week but if we ever need to change we can.

Elaine in the FDMAT 108 course also mentioned that her group met at the same time each week. "We pretty much meet the same time every week…so we know when we are going to meet and you don't forget." In contrast, Sarah in a different group in the FDMAT 108 course commented that she felt it was difficult arranging a meeting time each week with her group: "We have to find

a time [to meet together], which is what I don't actually like about it…. it is difficult to try to find a time when everyone can get together."

In addition to keeping students in small groups and allowing them to arrange their own group meeting times each week, it may be beneficial to encourage the groups to set a regular meeting time during the week instead of having a rotating group leader suggest new meeting times each week. The instructor could also adjust the students who were in groups that had chosen a time that was not convenient for them and find a group that is meeting at a different time.

Multiple asynchronous groups. The two other cases considered in this study, ENG 335 and FDSCI 205, had *Teach One Another* activities that used asynchronous tools and had students participating in multiple groups. Both cases used the discussion board tool, and the groups in the FDSCI 205 case also used the wiki tool. Both of these cases also had students participating in two different-sized groups during the *Teach One Another* activity. The ENG 335 case had students working in a full-class size group, and also in small groups of about five. The FDSCI 205 case had students working in large groups of about ten students, and also small groups of four students.

Individual preparation before group interaction. In all four of the cases the students were asked to do individual learning work in advance of the *Teach One Another* activity. Asking students to be prepared when they participated in learning activities with their peers was part of the BYU–Idaho Learning Model process, and was designed into each of these cases. While some students chose not to complete their preparation work before interacting with their group, these cases were created to encourage students to come to the group activity with the mindset that the activity will continue or further their learning of the topic. The *Teach One Another* activities

were not used as a starting point, but as a place to refine, deepen, and broaden ones individual ideas as he or she engaged with peers who may have had differing perspectives.

Asynchronous dialogue process. Two cases used discussion boards in a way that asked students to engage in an interactive discussion by posting and responding to their peers. However, there were differences in the ways students approached the activities and used the tool pedagogically. The ENG 335 case had students using the discussions all week as a full class and in small groups. This case used the discussion board tool as a way to simulate a class discussion and a group study session. Kendra shared how this works for her, “I read through everyone’s first, and then I make my comment, and then I respond to others’.”

The FDSCI 205 case had the students work first in a wiki with their larger groups during the first half of the week, and then during the second half of the week the students switched into their smaller groups and used the discussion board tool. This case used the wiki tool to help the larger groups collaborate on assembling their homework, and then used the discussion board in their small groups as more of a question and answer forum. Robin explained well how the first part of the week happened on the wikis:

> You start posting pieces, and then the next person who gets on they'll take the different pieces and they can try and put it together. And the next person that gets on, they can take those pieces and try to put them together, or re-arrange it, or edit it, or add any other information that they have gotten.

After the mid-week deadline on Wednesday, the groups changed into their smaller jigsaw groups where they took what they learned in the first-half of the week and taught it to their smaller groups. This was how Leo said it worked in his groups, “We share our [work] with the

other members in the group and they share theirs. And then everybody reads over the [information] and asks a question about it and a comment."

Using these asynchronous tools allowed students in these *Teach One Another* activities to work in different groups and do different types of homework assignments. The different implementations of the same asynchronous discussion board tool in the FDSCI 205 and ENG 335 cases allowed different types of group work to be completed that fit the content of each course.

Comparing online to classroom. Although this study deliberately avoided a research design that compared online courses with on-campus classroom courses, some students mentioned the comparison on their own. These comments exhibited a more rhetorical tone. For example, Nikki in the FDREL 211 case mused, "Who's to say if [the TOA] would be better or worse to do face to face compared to online? It's just different." Others mentioned that there were some virtues to how the activity was specifically designed for delivery as an online course. This was shown in Leo's suggestion about the jigsaw activity in the FDSCI 205 case, "The jigsaw activity is more efficient than, I would say, a teacher's presentation on it." This statement carried some irony because the *Teach One Another* activity in Leo's course was designed to emulate a successful instructional strategy used in the classroom called "jigsaw."

Directly comparing online and classroom was also mentioned by a couple of students in the ENG 335 case. Both of these students thought that online class discussions were benefited because all students could participate and students had time to carefully consider and prepare their thoughts before posting them. Tami said, "If you were in a regular classroom setting you would miss that there isn't the time to engage like there is in this kind of setting." Rebecca also supported this idea:

> In some ways [the TOA] has an advantage over even a classroom discussion, because you have the time to think about your comments, and there is not a limit on what you say, and you can think it through, you can edit…. [The TOA] encourages participation even more.

In Rebecca's last statement she suggested that because students had time to prepare their thoughts and edit them before posting to the class, doing the class discussion online in an asynchronous mode might actually encourage more participation.

Graded activities. The instructors assessed all of the *Teach One Another* activities completed by the students as part of a student's mastery of the subject matter. Although each case scored its activity with different weight toward a student's final score in the course, the activities were all required and not optional. Knowing that these activities were graded encouraged some sense of motivation for students to complete them in a satisfactory manner.

Regular deadlines. When students were expected to interact with peers on a given subject, it was important for everyone to work through the learning material at the same pace. To achieve this, all four of these cases had a mid-week deadline and a deadline at the end of each week to help space out the peer interactions. One student apparently expected her online course to allow her to work on the materials whenever she wanted and at her own pace. Because her course did not allow this she felt disdain toward the course. Many others in the cases suggested that they appreciated the regular deadlines to help keep them on track and to help set the time for their peer activities.

This cross-case comparison chapter has highlighted three broad patterns of themes found across all four cases: how *Teach One Another* encourages accountability, builds trust, and deepens learning. The chapter also discussed the concerns voiced by students, as well as

compared themes related to the design of the activities across the cases. In the next and final chapter, an open discussion about the findings of this study is presented.

Discussion

The purpose of this research study was to gather insights into how students experienced *Teach One Another* activities in an online course. To accomplish this, the study identified four courses that implemented the principles of *Teach One Another* in a unique way and examined them through multiple interviews, a survey, and online course document reviews. The implications identified in this study inform interested institutions and instructional designers in creating online courses that encourage student responsibility for learning through regular peer interaction.

The primary contribution of this study is how the *Teach One Another* activities show what Reciprocal Peer Learning could look like in courses taught exclusively to online students. Reciprocal Peer Learning has been a useful strategy to promote learning in traditional face-to-face courses, but very little scholarly literature attempts to explore the use of Reciprocal Peer Learning in the online learning context. Because online learning experienced significant growth over the past decade and is forecasted to grow rapidly for at least the next decade (Alfred P. Sloan Foundation, 2008) it is important to understand how strategies like Reciprocal Peer Learning translate to the online context. This study adds four online learning cases to the body of Reciprocal Peer Learning literature.

Generally, students said their experience with the *Teach One Another* activities contributed to their learning of the course material. This supports the notion that requiring student interaction and encouraging students to share ideas can promote deeper learning (Conrad & Donaldson, 2004). This also suggests that students in each individual course generally felt that the *Teach One Another* activities were successful.

The following section highlights the four common features of Reciprocal Peer Learning and *Teach One Another* activities. Each feature synthesizes the connections between Reciprocal Peer Learning as the theoretical framework and the themes across the *Teach One Another* activities. The final section of the discussion presents several implications for course designers and developers of online courses.

Connections to the Reciprocal Peer Learning Framework

Reciprocal Peer Learning has been shown to be an effective learning and teaching strategy in the classroom (Boud, 2001; Boud, et al., 2001; Sampson, Cohen, et al., 1999). This section is a synthesis from the data of the four online cases around the four common features of Reciprocal Peer Learning and *Teach One Another* (see Table 1) and it discusses how students shared their experiences related to these four features. The four areas related to both models are (a) students engage with one another, (b) students learn both from and with each other, (c) students practice and apply, and (d) students accept responsibility. This study presents the connections between the online student experience with *Teach One Another* activities and the Reciprocal Peer Learning framework in the sections below.

Students engage with one another. Course developers specifically designed the *Teach One Another* learning activities to encourage students to be actively and repeatedly engaged with one another. Several factors led to student engagement with their peers: (a) the peer activities happened each week, (b) instructors graded peer activities and this carried substantial weight toward a student's grade, (c) other peers would contact and encourage others to stay involved with the group, and (d) students felt a sense of accountability to their peers to be prepared and do their best work. Some students expressed their experience of building trust or friendships with their peers through their repeated interactions. One observation from a student suggested that

their group's learning grew over time as they had more practice interacting and felt greater trust in one another. This feature of student engagement seems to be tightly connected with the feature of responsibility discussed below. This may be because as students repeatedly engage with one another, they feel a greater sense of responsibility toward the learning of their peers, as they want to contribute their best work for the benefit of all.

Students learn both from and with each other. Students shared many experiences where they learned from their peers while participating in the *Teach One Another* activities. Many students shared experiences where they felt their efforts seemed to have an impact on their peers' learning. Some students expressed feelings of excitement or satisfaction when they witnessed their work being part of another's learning experience. A major theme across all four of the cases was the *Teach One Another* activities helped deepen the learning of the students. Students often expressed this as an appreciation for the varying perspectives of others on a topic. Students also conveyed deeper learning because different answers from their peers provided opportunities to negotiate and discuss how to arrive at a common solution for the group. Finally, peer groups demonstrated deeper learning from and with others when the group divided up the workload of a topic, and compiled their individual efforts into a more rich and deep report than one individual could achieve on their own. For the cases in this study, these were the primary ways students reported learning from and with each other.

Students practice and apply. Of the four common features of *Teach One Another* and Reciprocal Peer Learning, the least represented feature mentioned by students was *practice and apply*. The students were certainly busy doing the *Teach One Another* activities in the class, as well as additional assignments and activities to complete individually. Students had an opportunity each week to practice a similar *Teach One Another* activity with their groups within

a different topic or context. They practiced developing collaboration skills, communicating with online tools, and completing group assignments. However, practice and application of what they were learning was not something that the students referred to. Plenty of comments spoke about the *Teach One Another* activity deepening their learning or understanding, but not directly referencing application or practice. This may have to do with the courses not focusing on practice or application skills. This study suggests that BYU–Idaho look closely at this lack of evidence from students concerning this feature and determine if the *Teach One Another* activities need to be modified to include practice or application components.

Students accept responsibility. Students in each of the cases expressed some level of responsibility to be prepared for the *Teach One Another* activity or to do their best work for the benefit of all of their peers. This feature connects to the themes found in this study about motivation, accountability, and preparedness. Generally students felt accountable to their peers and felt a sense of motivation to be prepared for the *Teach One Another* activity. Some students exhibited a desire to be prepared so as to avoid feeling unpreparedness shame, which is a sense of guilt or distress when not properly prepared for the peer interactions. Thus, the sense of responsibility seemed to motivate students to complete individual assignments that led up to the peer *Teach One Another* activities. One impact may be that these activities help improve student achievement on course assessments, based on the ideas that students feel more motivated to complete all assignments and are learning at a deeper level. This feature seems very connected to the student engagement feature discussed above. This connection may be because students felt a responsibility to help their peers learn and to be prepared for their interactions, which drove the students to be more engaged with each other and with all of the course content.

Spiritual Dimension. One area of difference from Reciprocal Peer Learning is that *Teach One Another* also has a religious connotation to the campus community at BYU–Idaho. This spiritual area was not a focus of this study because there was not a direct connection to the theoretical framework of Reciprocal Peer Learning. This dimension encompassing the spiritual nature of *Teach One Another* may be an area of further study. The fact that this study did not reveal any details of this dimension may be important for BYU–Idaho to consider. For example, should *Teach One Another* at BYU–Idaho look and feel different than Reciprocal Peer Learning at other institutions? Despite the fact that participants in the study did not explicitly mention the more spiritual aspects of the *Teach One Another* model, they did mention themes such as building trust, developing relationships, creating friendships, and positive feelings from helping others learn, that may or may not be implicitly connected to how a student would describe the spiritual dimension.

Implications for Online Course Designers

This research has specific implications for instructional designers or course developers who are creating online curriculum. The *Teach One Another* and Reciprocal Peer Learning frameworks assume repeated student interaction, with the intent of students learning from and with their peers. These learning strategies encourage student motivation and responsibility for learning in online courses. This study highlights that the *Teach One Another* and Reciprocal Peer Learning strategies can: (a) encourage greater motivation when sequenced later in the unit; (b) help students develop trusting relationships with their peers; and (c) provide opportunities for students to feel success in their learning.

One pattern identified was a sense of accountability to be well prepared for the peer *Teach One Another* activities. When students recognize the course requires them to teach what

they are learning, they generally motivate themselves to be prepared for the upcoming interaction with their peers. Most students felt that the *Teach One Another* activities deepened their understanding of the course material. This strategy places emphasis on the sequencing of the learning activities. To leverage this motivation to be accountable, the *Teach One Another* activities must come after other individual learning activities. It is important to realize that when peer activities come at the beginning of an instructional unit, instructors may lose an opportunity to leverage a student's feelings of social pressure to be prepared for an upcoming peer activity.

Another implication of the *Teach One Another* activities is that students feel a sense of connectedness to the course as they develop bonds of trust and friendship with their peers. In contrast, some studies show students in many online courses may harbor feelings of isolation (Palloff & Pratt, 2005). Requiring regular interaction with peers seems to help students feel like they are not learning the material alone or without any support. A course with *Teach One Another* or Reciprocal Peer Learning activities can help students develop these feelings of trust with one another and encourage students to stay on task. This may also have indirect implications for BYU–Idaho because building these feelings of trust and friendship may be part of the spiritual dimension of *Teach One Another* that needs further investigation.

As trust and friendship develop, students typically feel a stronger sense of responsibility to contribute to the peer learning activities. A student can feel success in their own learning experience when they regularly witness peers learning from their interactions in the *Teach One Another* activities. The *Teach One Another* activities seem to help students develop a greater sense of ownership in their own learning, as well as the learning of their peers.

The courses used as cases in this study, all with *Teach One Another* activities, required students to teach their peers as they also learned from their peers. All of these courses followed a

semester timeline with weekly units of instruction. This study reveals that most of students believe that the *Teach One Another* activities contributed to their learning of the material. The design of a *Teach One Another* activity that requires students to teach something about the learning material to someone else changes how deeply students learn the course material because they realize they must share their new knowledge with their peers.

Conclusion

Faculty created the BYU–Idaho Learning Model to deepen the learning experiences of students (Brigham Young University–Idaho, 2009b). Not much scholarly literature is available in academia related to the BYU–Idaho Learning Model (Brigham Young University–Idaho, 2007), or more specifically the *Teach One Another* part of the learning process. As identified above, the distinctive feature of *Teach One Another* at BYU–Idaho is very similar to the core principle in the academic area of Reciprocal Peer Learning.

Reciprocal Peer Learning is an educational strategy that researchers studied previously in a traditional classroom setting and for professional development in the workplace (Boud, 1999; Boud, et al., 2001; Sampson, Cohen, et al., 1999). Only a small amount of identified research exists that specifically focuses on Reciprocal Peer Learning activities in an online setting. In the introduction to their 2001 book, *Peer Learning in Higher Education*, David Boud, Ruth Cohen, and Jane Sampson acknowledge that a "new interest has arisen more recently from those confronting the challenges of learning online" (p. 12). This research contributes to the limited dialogue focused on Reciprocal Peer Learning in online courses by sharing these four cases of student experiences within *Teach One Another* activities in online courses at Brigham Young University–Idaho.

Including four cases that had unique instructional implementations of the *Teach One Another* activities gives a broad view of the diverse ways to use online tools and technology to encourage and require students to be actively involved in their own and their peers' learning. This study provided insights into the similarities and differences across the design of these four cases, which gives the reader an opportunity to apply the implications into their own setting. Students reported their experience in the *Teach One Another* activities in online courses at BYU–

Idaho included three primary themes: The *Teach One Another* activities, (a) encourage accountability, (b) build trust, and (c) deepen learning. These three themes are positive outcomes of the online learning activities.

When course developers appropriately design *Teach One Another* activities, most students feel these activities contribute to their learning of the topic and make their learning experience more appealing. Across all four cases, 88% of students felt the *Teach One Another* activity contributed to their learning. However, 31% of students felt the *Teach One Another* activities were not appealing. Therefore, some students who do not find the activity appealing are still willing to acknowledge that it contributes to their learning. This perspective from the surveys is important because the students who were interviewed were more positive toward their learning experiences than the averages found in surveys.

The research in this study also offers a window into an institutional educational strategy. *Teach One Another* at BYU–Idaho is similar to Reciprocal Peer Learning and this study provided individual case analyses as well as a cross-case comparison. Every online course offered at BYU–Idaho includes *Teach One Another* activities. The research presented in this study is unique in that it highlights a university-wide initiative to implement Reciprocal Peer Learning, called *Teach One Another*, in all campus courses whether taught on-campus or online.

Learning some of what students are experiencing now can help inform new ideas for other online learning programs. As online technology continues to advance, it is helpful to have a historical perspective for reference and to track trends over time. This study can be an important part of this perspective. Online learning programs or online course designers that want to give students opportunities to deepen their learning of the content and develop life skills such as accountability, responsibility, and trust may want to consider including regular Reciprocal Peer

Learning activities that encourage students to simultaneously learn for themselves and contribute to their peers' learning.

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Appendix A: Brigham Young University–Idaho Mission Statement

MISSION STATEMENT

BRIGHAM YOUNG UNIVERSITY–IDAHO

Brigham Young University–Idaho is affiliated with The Church of Jesus Christ of Latter-day Saints. Its mission is to:

1. Build testimonies of the restored gospel of Jesus Christ and encourage living its principles.
2. Provide a quality education for students of diverse interests and abilities.
3. Prepare students for lifelong learning, employment, and for their roles as citizens and parents.
4. Maintain a wholesome academic, cultural, social, and spiritual environment.

Appendix B: Brigham Young University–Idaho Learning Model, page one

BYU IDAHO

Brigham Young University–Idaho

Learning Model

September 2007

VISION STATEMENT

At BYU–Idaho we foster faith-building and life-changing learning. Our faith in the Lord Jesus Christ, the gifts of the Holy Ghost, our commitment to the restored gospel, and our effort to build a Zion learning community motivate us to learn and teach by study and by faith.

UNDERLYING ASSUMPTIONS

1. Everyone at BYU–Idaho is a learner and a teacher.
2. Learners and teachers at BYU–Idaho are at different levels in their individual progress toward learning by study and also by faith.
3. The principles of the Learning Model apply to all aspects of the BYU–Idaho experience.
4. Our understanding of the learning and teaching process grows as we pursue inspired inquiry and innovation.

PRINCIPLES

Learners and teachers at BYU–Idaho:

1. exercise faith in the Lord Jesus Christ as a principle of action and power;
2. understand that true teaching is done by and with the Holy Ghost;
3. lay hold upon the word of God—as found in the holy scriptures and in the words of the prophets—in all disciplines;
4. act for themselves and accept responsibility for learning and teaching;
5. love, serve, and teach one another.

Appendix C: Student Survey Questionnaire

The survey questions and instructions are listed below. It will be administered online so the formatting will be different.

Instructions: The survey has 10 questions and should take you about 10-15 minutes to complete. This survey is about the <u>*<insert name of Teach One Another activity here>*</u> in your <u>*<insert the name of the class here>*</u>, The questions below will refer to this activity as the *Teach One Another* activity.

1) On average in one week, how many hours did you spend working on the *Teach One Another* activity?

   Open-ended short answer

2) In one week how many times did you return to access the *Teach One Another* activity?

   I only accessed the activity once

   I returned one time

   I returned 2 or 3 times

   I returned 4 or more times

3) How would you classify your effort in completing the *Teach One Another* activity during the week?

   I went above and beyond the requirements of the activity

   I fulfilled the requirements of the activity

   I could have done a little more

   I could have done a lot more

   I did not complete the work

4) Did the *Teach One Another* activity contribute to your learning of the lesson/unit topic?

   Yes, it contributed a lot to my learning of the topic

   Yes, it contributed a little to my learning of the topic

   No, it did not contribute to my learning of the topic

5) Compared to the other activities in the lesson, was the *Teach One Another* activity more or less influential to your learning?

   The *Teach One Another* activity was the most influential part of my learning of the lesson topic

   The *Teach One Another* activity was more influential than some, but not all, of the other activities

   The *Teach One Another* activity was equally influential to the other activities to my learning

   The *Teach One Another* activity was not influential to my learning of the lesson topic

6) How much interaction with your classmates did the *Teach One Another* activity make possible?

   The *Teach One Another* activity provided many opportunities to interact with your classmates

   The *Teach One Another* activity provided a few opportunities to interact with your classmates

   The *Teach One Another* activity did not provide any opportunities to interact with classmates

7) Did the interactions with your peers deepen your learning of the lesson topic?

   The interactions with my peers deepened my learning a lot

   The interactions with my peers deepened my learning a little

   The interactions with my peers did not deepen my learning

8) How confident are you that your contributions to the *Teach One Another* activity influenced your peers in their learning of the lesson topic?

   I am very confident that my contributions helped deepen my peers learning

   I am a little confident that my contributions helped deepen my peers learning

   I am not very confident that my contributions helped deepen my peers learning

9) Would you consider the *Teach One Another* activity an enjoyable learning experience?

   Yes, I enjoyed the *Teach One Another* activity very much

   Yes, I enjoyed the *Teach One Another* activity a little

   No, I did not enjoy the *Teach One Another* activity

10) Would you consider the *Teach One Another* activity more enjoyable than the other learning activities in the lesson?

    The *Teach One Another* activity was more enjoyable than much of the other learning activities in the lesson

    The *Teach One Another* activity was not more or less enjoyable than the other learning activities in the lesson

    The *Teach One Another* activity was less enjoyable than the other learning activities in the lesson

11) Would you be willing to participate in a short interview (30 – 45 minutes) about your experience with the *Teach One Another* activity? (Not everyone will be interviewed, only a few who say yes will be selected.)

Yes or No

Appendix D: Student Guiding Interview Questions

Setup: Remind the student that the interview is about a specific *Teach One Another* activity (use the name of the activity) in a recently completed lesson.

Grand Tour Question: Could you walk me through the full experience that you had in preparing for and participating in the *Teach One Another* activity?

1) In what ways do you feel the *Teach One Another* activity contributed to your learning experience in the lesson?

   (Expound, Explain, Elaborate, Go into more detail, …)

2) In what ways did the *Teach One Another* activity encourage you to be responsible for your own learning?

   …also responsible for contributing to your peers' learning experiences?

3) In what ways did your classmates influence or contribute to your learning as part of the *Teach One Another* activity?

4) In what ways was the *Teach One Another* activity enjoyable or appealing?

5) Do you have any ideas or suggestions about how to improve the *Teach One Another* activity?

List other specific questions for this case from the survey analysis:

Appendix E: Instructor Guiding Interview Questions

Setup: Remind the instructor that the interview is about the student experience during a specific *Teach One Another* activity (use the name of the activity) in a recently completed lesson.

Grand Tour Question: Could you walk me through the full experience that a student would have in preparing for and participating in the *Teach One Another* activity?

1) In what ways do you feel the *Teach One Another* activity contributed to the students' learning experiences in the lesson?
2) Compared to the other activities in the lesson, do your think the *Teach One Another* activity was more or less influential to the students' learning?
3) Do think the student interactions in the *Teach One Another* activity deepened their learning of the lesson topic?
4) Do you feel your contributions to the *Teach One Another* activity influenced the students' learning of the lesson topic?
5) Did you observe any evidence of the student's learning from each other as they worked through the *Teach One Another* activity?
6) In what ways did the *Teach One Another* activity encourage students to be responsible for their own learning?
7) Do the students seem to enjoy the *Teach One Another* activity?
8) What suggestions do you have to improve the student's learning experience with the *Teach One Another* activity?

List other specific questions for this case from the survey analysis:

Appendix F: ENG 335 Student Survey Results

N=18

Question One: On average in one week, how many hours did you spend working on the *Teach One Another* activity?

2.3	Mean
1.0 to 5.0	Range
1.19	Standard Deviation

Question Two: In one week how many times did you return to access the *Teach One Another* activity?

%	Answer
12%	I only accessed the activity once
12%	I returned one time
41%	I returned 2 or 3 times
35%	I returned 4 or more times

Question Three: How would you classify your effort in completing the *Teach One Another* activity during the week?

%	Answer
11%	I went above and beyond the requirements of the activity
67%	I fulfilled the requirements of the activity
17%	I could have done a little more
6%	I could have done a lot more
0%	I did not complete the work

Question Four: Did the *Teach One Another* activity contribute to your learning of the lesson/unit topic?

%	Answer
17%	Yes, it contributed a lot to my learning of the topic
72%	Yes, it contributed a little to my learning of the topic
11%	No, it did not contribute to my learning of the topic

Question Five: Compared to the other activities in the lesson, was the *Teach One Another* activity more or less influential to your learning?

%	Answer
11%	The *Teach One Another* activity was the most influential part of my learning of the lesson topic
28%	The *Teach One Another* activity was more influential than some, but not all, of the other activities
39%	The *Teach One Another* activity was equally influential to the other activities to my learning
22%	The *Teach One Another* activity was not influential to my learning of the lesson topic

Question Six: How much interaction with your classmates did the *Teach One Another* activity make possible?

%	Answer
59%	The Teach One Another activity provided many opportunities to interact with your classmates
41%	The Teach One Another activity provided few opportunities to interact with your classmates
0%	The Teach One Another activity provided no opportunities to interact with classmates

Question Seven: Did the interactions with your peers deepen your learning of the lesson topic?

%	Answer
22%	The interactions with my peers deepened my learning a lot
67%	The interactions with my peers deepened my learning a little
11%	The interactions with my peers did not deepen my learning

Question Eight: How confident are you that your contributions to the *Teach One Another* activity influenced your peers in their learning of the lesson topic?

%	Answer
17%	I am very confident that my contributions helped deepen my peers learning
67%	I am a little confident that my contributions helped deepen my peers learning
17%	I am not very confident that my contributions helped deepen my peers learning

Question Nine: Would you consider the *Teach One Another* activity an enjoyable learning experience?

%	Answer
28%	Yes, I enjoyed the Teach One Another activity very much
50%	Yes, I enjoyed the Teach One Another activity a little
22%	No, I did not enjoy the Teach One Another activity

Question Ten: Would you consider the *Teach One Another* activity more enjoyable than the other learning activities in the lesson?

%	Answer
11%	The Teach One Another activity was more enjoyable than much of the other learning activities in the lesson
61%	The Teach One Another activity was not more or less enjoyable than the other learning activities in the lesson
28%	The Teach One Another activity was less enjoyable than the other learning activities in the lesson

Question Eleven: Would you be willing to participate in a short interview (30 – 45 minutes) about your experience with the Teach One Another activity?

%	Answer
44%	Yes
56%	No

Appendix G: FDMAT 108 Student Survey Results

N=34

Question One: On average in one week, how many hours did you spend working on the *Teach One Another* activity?

2.6	Mean
1.0 to 5.0	Range
0.92	Standard Deviation

Question Two: In one week how many times did you return to access the *Teach One Another* activity?

%	Answer
6%	I only accessed the activity once
18%	I returned one time
56%	I returned 2 or 3 times
21%	I returned 4 or more times

Question Three: How would you classify your effort in completing the *Teach One Another* activity during the week?

%	Answer
24%	I went above and beyond the requirements of the activity
53%	I fulfilled the requirements of the activity
21%	I could have done a little more
3%	I could have done a lot more
0%	I did not complete the work

Question Four: Did the *Teach One Another* activity contribute to your learning of the lesson/unit topic?

%	Answer
35%	Yes, it contributed a lot to my learning of the topic
59%	Yes, it contributed a little to my learning of the topic
6%	No, it did not contribute to my learning of the topic

Question Five: Compared to the other activities in the lesson, was the *Teach One Another* activity more or less influential to your learning?

%	Answer
0%	The *Teach One Another* activity was the most influential part of my learning of the lesson topic
21%	The *Teach One Another* activity was more influential than some, but not all, of the other activities
65%	The *Teach One Another* activity was equally influential to the other activities to my learning
15%	The *Teach One Another* activity was not influential to my learning of the lesson topic

Question Six: How much interaction with your classmates did the *Teach One Another* activity make possible?

%	Answer
41%	The Teach One Another activity provided many opportunities to interact with your classmates
59%	The Teach One Another activity provided few opportunities to interact with your classmates
0%	The Teach One Another activity provided no opportunities to interact with classmates

Question Seven: Did the interactions with your peers deepen your learning of the lesson topic?

%	Answer
9%	The interactions with my peers deepened my learning a lot
76%	The interactions with my peers deepened my learning a little
15%	The interactions with my peers did not deepen my learning

Question Eight: How confident are you that your contributions to the *Teach One Another* activity influenced your peers in their learning of the lesson topic?

%	Answer
29%	I am very confident that my contributions helped deepen my peers learning
59%	I am a little confident that my contributions helped deepen my peers learning
12%	I am not very confident that my contributions helped deepen my peers learning

Question Nine: Would you consider the *Teach One Another* activity an enjoyable learning experience?

%	Answer
21%	Yes, I enjoyed the Teach One Another activity very much
56%	Yes, I enjoyed the Teach One Another activity a little
24%	No, I did not enjoy the Teach One Another activity

Question Ten: Would you consider the *Teach One Another* activity more enjoyable than the other learning activities in the lesson?

%	Answer
3%	The Teach One Another activity was more enjoyable than much of the other learning activities in the lesson
74%	The Teach One Another activity was not more or less enjoyable than the other learning activities in the lesson
24%	The Teach One Another activity was less enjoyable than the other learning activities in the lesson

Question Eleven: Would you be willing to participate in a short interview (30 – 45 minutes) about your experience with the Teach One Another activity?

%	Answer
47%	Yes
53%	No

Appendix H: FDREL 211 Student Survey Results

N=20

Question One: On average in one week, how many hours did you spend working on the *Teach One Another* activity?

2.4	Mean
1.0 to 4.0	Range
1.05	Standard Deviation

Question Two: In one week how many times did you return to access the *Teach One Another* activity?

%	Answer
20%	I only accessed the activity once
25%	I returned one time
45%	I returned 2 or 3 times
10%	I returned 4 or more times

Question Three: How would you classify your effort in completing the *Teach One Another* activity during the week?

%	Answer
10%	I went above and beyond the requirements of the activity
75%	I fulfilled the requirements of the activity
5%	I could have done a little more
10%	I could have done a lot more
0%	I did not complete the work

Question Four: Did the *Teach One Another* activity contribute to your learning of the lesson/unit topic?

%	Answer
35%	Yes, it contributed a lot to my learning of the topic
45%	Yes, it contributed a little to my learning of the topic
20%	No, it did not contribute to my learning of the topic

Question Five: Compared to the other activities in the lesson, was the *Teach One Another* activity more or less influential to your learning?

%	Answer
0%	The *Teach One Another* activity was the most influential part of my learning of the lesson topic
25%	The *Teach One Another* activity was more influential than some, but not all, of the other activities
45%	The *Teach One Another* activity was equally influential to the other activities to my learning
30%	The *Teach One Another* activity was not influential to my learning of the lesson topic

Question Six: How much interaction with your classmates did the *Teach One Another* activity make possible?

%	Answer
30%	The Teach One Another activity provided many opportunities to interact with your classmates
60%	The Teach One Another activity provided few opportunities to interact with your classmates
10%	The Teach One Another activity provided no opportunities to interact with classmates

Question Seven: Did the interactions with your peers deepen your learning of the lesson topic?

%	Answer
15%	The interactions with my peers deepened my learning a lot
55%	The interactions with my peers deepened my learning a little
30%	The interactions with my peers did not deepen my learning

Question Eight: How confident are you that your contributions to the *Teach One Another* activity influenced your peers in their learning of the lesson topic?

%	Answer
15%	I am very confident that my contributions helped deepen my peers learning
60%	I am a little confident that my contributions helped deepen my peers learning
25%	I am not very confident that my contributions helped deepen my peers learning

Question Nine: Would you consider the *Teach One Another* activity an enjoyable learning experience?

%	Answer
35%	Yes, I enjoyed the Teach One Another activity very much
30%	Yes, I enjoyed the Teach One Another activity a little
35%	No, I did not enjoy the Teach One Another activity

Question Ten: Would you consider the *Teach One Another* activity more enjoyable than the other learning activities in the lesson?

%	Answer
25%	The Teach One Another activity was more enjoyable than much of the other learning activities in the lesson
45%	The Teach One Another activity was not more or less enjoyable than the other learning activities in the lesson
30%	The Teach One Another activity was less enjoyable than the other learning activities in the lesson

Question Eleven: Would you be willing to participate in a short interview (30 – 45 minutes) about your experience with the Teach One Another activity?

%	Answer
35%	Yes
65%	No

Appendix I: FDSCI 205 Case Preparation Instructions

As part of your class exercise this week, you will be putting together a case study of personal genetics similar to the one above. In order to complete the assignment you will need to educate yourself and come prepared with background information on one of the cases listed below. Each case is linked to a different personal genetics service provider. Go to the indicated website to begin your inquiry. Although your primary purpose will be to find out information for your case study you should also take a moment to explore the service's website. For each case you will need to search the Internet for additional information. You need not be exhaustive. As a group, develop the case study, which needs to include the following elements:

1. Opening paragraph introducing the individual and providing background information. Be creative but realistic. This is an opportunity to think of how the assigned trait might apply in real life.
2. The main body of the case study will present information about the gene and trait involved in the case study. As in the example above, you may paraphrase or directly quote information from a given page but keep all the information from one site in a single paragraph and then identify the source of that information at the end of the paragraph. You should get information from at least three different sites. You should try to address the following topics but each item may not be available for all cases.
    - What is the gene or protein being presented?
    - What is the normal associated trait or condition?
    - What is the trait or condition associated with the SNP?
    - How much of the trait is affected by the associated SNP and how much is environmental?

- Try to include other useful data like which chromosome it's located on, its distribution in the population, the site of nucleotide polymorphism if known, etc…
- Each study must include 2-3 scientific citations that link the gene with the trait.

3. The closing of your paragraph will evaluate the information found about the gene and trait and describe how the information was applied. Again be creative but grounded. After studying the issue you may decide that the information has great or little value. Whatever the outcome be sure you support your conclusions.

	Bad (0pts)	OK (3pts)	Great (5pts)
Participation			
Opening paragraph			
Relevant questions			
Closing			
Professionalism			

Go to you Group wiki and assemble a case based on the topic assigned to you below.

Group A Case Study

Gene: CCR5

Trait: HIV Resistance

Starting Point: 23andme Login: fdsci205 Password: [removed]

Once logged in type the term HIV resistance into the Search box in the upper right corner. Then click on the HIV resistance link. This will take you to the sample results page for Greg Mendel. Be sure to read through the **Your Data**, **How it Works**, **Timeline**, and **Resources** tabs. You can explore additional traits that 23andme includes in their scan by clicking My Health and Traits at the top of the left hand menu.

Appendix J: FDSCI 205 Student Survey Results

N=28

Question One: On average in one week, how many hours did you spend working on the *Teach One Another* activity?

3.1	Mean
1.0 to 5.0	Range
1.21	Standard Deviation

Question Two: In one week how many times did you return to access the *Teach One Another* activity?

%	Answer
4%	I only accessed the activity once
11%	I returned one time
57%	I returned 2 or 3 times
29%	I returned 4 or more times

Question Three: How would you classify your effort in completing the *Teach One Another* activity during the week?

%	Answer
14%	I went above and beyond the requirements of the activity
50%	I fulfilled the requirements of the activity
29%	I could have done a little more
4%	I could have done a lot more
4%	I did not complete the work

Question Four: Did the *Teach One Another* activity contribute to your learning of the lesson/unit topic?

%	Answer
25%	Yes, it contributed a lot to my learning of the topic
61%	Yes, it contributed a little to my learning of the topic
14%	No, it did not contribute to my learning of the topic

Question Five: Compared to the other activities in the lesson, was the *Teach One Another* activity more or less influential to your learning?

%	Answer
4%	The *Teach One Another* activity was the most influential part of my learning of the lesson topic
18%	The *Teach One Another* activity was more influential than some, but not all, of the other activities
61%	The *Teach One Another* activity was equally influential to the other activities to my learning
18%	The *Teach One Another* activity was not influential to my learning of the lesson topic

Question Six: How much interaction with your classmates did the *Teach One Another* activity make possible?

%	Answer
36%	The Teach One Another activity provided many opportunities to interact with your classmates
64%	The Teach One Another activity provided few opportunities to interact with your classmates
0%	The Teach One Another activity provided no opportunities to interact with classmates

Question Seven: Did the interactions with your peers deepen your learning of the lesson topic?

%	Answer
4%	The interactions with my peers deepened my learning a lot
59%	The interactions with my peers deepened my learning a little
37%	The interactions with my peers did not deepen my learning

Question Eight: How confident are you that your contributions to the *Teach One Another* activity influenced your peers in their learning of the lesson topic?

%	Answer
14%	I am very confident that my contributions helped deepen my peers learning
71%	I am a little confident that my contributions helped deepen my peers learning
14%	I am not very confident that my contributions helped deepen my peers learning

Question Nine: Would you consider the *Teach One Another* activity an enjoyable learning experience?

%	Answer
11%	Yes, I enjoyed the Teach One Another activity very much
46%	Yes, I enjoyed the Teach One Another activity a little
43%	No, I did not enjoy the Teach One Another activity

Question Ten: Would you consider the *Teach One Another* activity more enjoyable than the other learning activities in the lesson?

%	Answer
14%	The Teach One Another activity was more enjoyable than much of the other learning activities in the lesson
54%	The Teach One Another activity was not more or less enjoyable than the other learning activities in the lesson
32%	The Teach One Another activity was less enjoyable than the other learning activities in the lesson

Question Eleven: Would you be willing to participate in a short interview (30 – 45 minutes) about your experience with the Teach One Another activity?

%	Answer
26%	Yes
74%	No