BEST PRACTICES IN K–12 ONLINE TEACHING: A QUANTITATIVE STUDY

EXPLORING SECONDARY CLASSROOMS ONLINE

AND BRICK-AND-MORTAR CLASSROOMS

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AUTHORIZATION TO SUBMIT

DISSERTATION

This dissertation of Jessi Sigander, submitted for the degree of Doctor of Philosophy in

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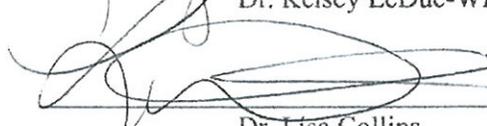
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DEDICATION

To my family: my husband Max, my daughter Ella, and my son Alex. Max, thank you for the endless hours of love and support you have given me in completing this dissertation. Your feedback, encouragement, and willingness to let me pursue my passion and dreams have been the greatest gifts to me; there is no one else I would want to walk through life with but you. Ella and Alex, thanks for being patient while mom worked on "her homework" and for giving me a reason to move forward and push myself to be more. Your perseverance and passion for life is a gift to me. To my Mom who was my first teacher in life and to my brother Ben, who pushes me to always stay on my toes academically. To my Grandma and Grandpa Spud, who loved me deeply, prayed for me more, and were the first ones to ask what I was going to study in college at the ripe age of 6. To my Swedish family, you have accepted me as one of your own and loved me well, for that I am so thankful and appreciative for all the joy and depth you have brought to my life. To Stephanie and Stacy, the sisters of my heart, who have prayed me through this journey. To my "sisterhood," I cannot imagine walking through life without your love, support, prayers, and laughter. Finally, to God my Father, the anchor for my soul.

ABSTRACT

Education in the 21st century is rapidly changing and expanding. The last 15 years has introduced a new concept of online education to students and schools throughout the nation. As online schooling continues to grow in K–12 schools in the United States, and technology increases in the brick and mortar classroom, there is a great need to identify best practices in both settings. Data were gathered using an online Likert-scale survey, distributed to secondary online teachers who were also brick-and-mortar teachers. Furthermore, this study desired to find a correlation between the technology used in the online classroom and an increased use of technology in brick-and-mortar classrooms. The study focused on the pedagogical practices being used in secondary online classrooms and how they influence online teaching practices in the brick-and-mortar classrooms. The study found that the pedagogical practices being used in post-secondary online classrooms are the same as those being used in secondary online classrooms. Furthermore, significant correlations were found between the pedagogical practices used in the online classroom and the pedagogical practices used in the secondary brick-and-mortar classroom. The transactional distance theory serves as the foundation for the research and design of this study.

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Chapter I

Introduction

Within the past 15 years, the education world has changed dramatically, due much in part to an increase in the use of technology and more specifically the introduction of online learning (Archambault & Crippen, 2009; Mbuva, 2014; Watson, Pape, Murin, Gemin, & Vashaw; 2014). The role of technology in education has changed how teaching takes place today. This trend has also started to shape much of the K–12 educational world, specifically in secondary education. The Center for Public Education (2012) found that 55% of school districts across the United States had students enrolled in some sort of online course, with 96% of these students being secondary students. Watson, Pape, Murin, Gemin, and Vashaw (2014) found that 30 states offered students the opportunity to attend school fully online and estimated that over 315,000 students chose this option for their education (Watson et al., 2014). The report also found that in the 2013–2014 school year there were over 740,000 enrollees in supplemental online programs provided through virtual schools. These numbers display a need for research in the field of online secondary education. The growth of online education is pushing school districts, private schools, and charter schools to re-evaluate how they will provide technological options and online education to their students. Archambault, Kennedy, and Bender (2013) stated, "In the past 25 years, K–12 online learning in particular has emerged as an educational choice for youth around the nation" (p. 4).

Today many online instructors work in both brick-and-mortar and online classroom at the same time (Dessoff, 2009). Much of the research conducted focused on best practices, students' success, student engagement, and overall satisfaction of online students have been at the postsecondary level (Bailie, 2014; Casey & Kroth, 2013; Gallien & Oomen-Early, 2008; Ni &

Aust, 2008). There have been few studies conducted at the K–12 level focusing on best practices in the online classroom (Barbour, 2013; Barbour & Reeves, 2009). DiPietro, Ferdig, Black, and Preston (2010) found that "research-based investigations into the teaching and learning process in this medium and at this level are still lacking" (p. 10). Cavanaugh, Barbour, and Clark (2009) reported that most research done in this field centered on student retention or readiness to learn in the classroom. Furthermore, Barbour (2013) found that "the research into effective strategies to support K–12 online learning is also scant and methodologically limited" (p. 7). Few studies have focused on best teaching practices in secondary online classrooms, or if these online classroom practices ever influence technology use in the brick and mortar classroom.

Teachers entering the world of K–12 online education often come from a traditional teacher training background and experiences in a brick-and-mortar classroom (Dawley, Rice, & Hinck, 2010). The role of a teacher in an online classroom is different from that found in a traditional classroom (Barbour, 2013; Barbour & Hill, 2011; McCombs & Vakili, 2005). Responsibilities of an online teacher include being a learning coach, a mentoring teacher, and a mediating teacher (Davis, 2007). As education begins to shift more and more to the online, teachers need to know how to organize their classrooms, engage students, and teach in an online setting (Barbour, 2008). This includes a need for understanding best practices, teaching techniques, issues that arise in an online classroom, student engagement, and student achievement online (Bangert, 2006; Barbour, 2008; Bush, Castelli, Lowry, & Cole, 2010; Li, Finley, Pitts, & Guo, 2011).

As education has seen a growth in online classrooms, the traditional classroom has also changed from the influence of technology. By 2009, 97% of classrooms had computers, and 93% of classrooms had Internet access (Gray, Thomas, Lewis, & Tice, 2010). Furthermore, 29% of

teachers used computers sometimes during their class instruction. Another study found that 74% of teachers used technology to enhance and reinforce the content they taught in their classrooms (Public Broadcasting Service [PBS] Educational Foundation, 2013).

Statement of the Problem

There is a need to conduct research in the area of K–12 online education (Crews & Neill, 2014; DiPietro, Ferdig, Black, & Preston; 2010). Much online education research comes from postsecondary online classrooms and teachers (Barbour, 2013). When looking at the research, it appears that postsecondary level students engage more and are more satisfied with online courses when there is a large amount of teacher engagement in the course (Barbour, 2008; Casey & Kroth, 2013; Ni & Aust, 2008; Skinner & Peters, 2012; Yu-Chun, Walker, Belland, Schroder, & Yu-Tung, 2014). A few studies have shown that teacher presence can come through collaborative discussions, teacher recordings, and quick teacher feedback time (Bailie, 2014; Casey & Kroth, 2013; Cheng, Pare, Collimore, & Joordens, 2011; Kirschner & Erkens, 2013). Research in the area of online education has also shown that teachers play a vital role in the overall success of students (Roblyer, Davis, Mills, Marshall, & Pape, 2008). However, teachers are hesitant to implement extensive amounts of technology in their classrooms due to a lack of skills, personal beliefs, and the amount of time it would take to do so (Levin & Wadmany, 2008; Teo, 2006).

The research for this study focused on current online secondary teachers and their use of pedagogical teaching practices in both online and brick-and-mortar classrooms. Due to the increase in online classes offered to secondary students, the question of what are the best practices arises. Similarly, because of the increase in brick and mortar teachers teaching online, one must ask if the pedagogical practices from the online classroom carry back over into the

brick-and-mortar setting. These pedagogical practices included such things as teacher feedback, teacher communication, synchronous and asynchronous instruction, the organization in their online classroom, and an increase in the use of technology in the brick-and-mortar classroom. Participants identified what practices they transfer from their online classroom to their brick-and-mortar classroom. The researcher created and validated a survey for this study. The researcher collected data from online secondary teachers. The goal of this study was to provide current and future online teachers with an idea of what pedagogical practices they use in their online classrooms and how these practices influence their use of technology in their brick and mortar classrooms.

Background

The use of technology has changed the face of education in the classroom (Allen & Seaman, 2011). In the early 1900s, the most common tools found in a classroom were pencils, papers, and chalkboards. In the 1950s and 1960s, schools began to use instructional television and overhead projectors (Boss, 2011). In 1970, professor Seymour Papert recognized that computers could encourage learning in students and make new concepts more interesting. Today there are computers available in almost every classroom in the United States (Boss, 2011).

In 1998, a study found that technology could provide positive benefits to students in the classroom, such as higher levels of thinking and creativity (Boss, 2011). Further studies showed that technology in the classroom engaged students in a new way and allowed them to work with information that they may not have had access to in the past. More recently, social media and the creation of the iPad have impacted classrooms and the use of online learning (Boss, 2011).

During the last 30 years, the concept of online education has grown from an idea into reality. In 1981, the Western Behavioral Sciences Institute School of Management and Strategic

Studies program started the first fully online program. In 1989, the University of Phoenix became the first private school to offer an entire program online (Miller, 2014). As technology became increasingly present in K-12 education, the initial push was to integrate it into the classroom, but without replacing the brick-and-mortar classroom (Miller, 2014). In 1991, Laurel Springs School was the first to create K–12 online programs (Barbour, 2013). In 2001, an estimate showed there were only 45,000 students enrolled in virtual schools nationwide, making up a very small percentage of the overall students enrolled in schools (Clark, 2001). Since 2000, the growth of K–12 online education has been staggering. In 2011, an estimated four million K–12 students took online courses (Barbour, 2013).

Today, every state offers the option of K–12 online schooling for students (see Figure 1). A recent area of growth in virtual education has taken place in school districts (Watson et al., 2014). School districts are now utilizing online education to provide more individualized educational choices to their students. Online learning tailored to the individual needs of districts (Watson et al., 2014). Many districts are currently moving toward a blend of traditional classroom teaching and providing the option for students to take online classes while enrolled in a traditional classroom (Barbour & Kennedy, 2014). At high schools around the nation, it is now common to find virtual options for students to take part in such classes as advanced placement, credit recovery, languages, and electives (Watson et al., 2014). There are several plausible causes for growth. Most recently, research has shown that online education can be as effective as face-to-face teaching (Hawkins, Barbour, & Graham, 2012).

There are many different models of K–12 online education used today (Barbour, 2013). The options range from full-time enrollment in a public, charter, or private school setting to blended learning models which partners with a public, charter, or private school. Some students

may take all of their classes online, while others enroll in just one or two (Watson et al., 2014).

Currently, several states require that their students complete an online course before being able

to graduate from high school (Watson et al., 2014). There has also been tremendous growth in

online education in the world of alternative education and independent study programs (Watson

et al., 2014).

Figure 1

Notable Operators Currently Providing Courses for the Nation

Table 2: Notable school operators and consortia in digital learning	Program name	Description
	Laurel Springs	The oldest online school in the United States. It started in 1991 and developed its online curriculum in 1994. It serves students in grades K–12.
	Stanford University Online High School	Offers a full-time online school and supplemental online courses for gifted students in grades 7–12. Started in 2006 and is situated at Stanford University.
	Oaks Christian Online School	Provided online courses to about 600 part-time students and 100 full-time students in SY 2013–14, and is growing at about 35% annually. About 15% of all students live outside of the U.S.
	BlendEd Consortium	Group of five independent schools in the San Francisco Bay Area working collaboratively to offer 10 blended classes beginning in fall 2014.
	Mission Dolores Academy	Independent, K–8 Catholic school that uses extensive digital learning to differentiate instruction in small groups across all grade levels.
	Online School for Girls	Consortium of 83 schools. In SY 2013–14, OSG offered 7 summer courses and 20 school year courses. It provided 872 semester enrollments to 420 unique students.
	Global Online Academy	Consortium that began in 2011 and offers online courses to 53 member schools representing 24 states, and nine international schools. In SY 2013–14 the consortium served about 500 course enrollments,
	VISNet	Consortium of about 60 independent schools, primarily in the southeastern U.S. In SY 2013–14 it served about 900 course enrollments. Member schools also use online content for onsite courses.
	Hybrid Learning Consortium	Collective of independent schools offering about 35 online courses for high school students. Founded and directed by The Barstow School.
	Connections Education	Has about 1,000 students in its private school, International Connections Academy. About 60% are full-time and 40% part-time.
	K12 Inc.	The largest operator of online public schools in the U.S. has three private schools that enroll students full-time and also offer individual online courses: The Keystone School, George Washington University Online High School, and K^{12} International Academy. These schools served a mix of 5,686 full-time and part-time students, totaling 22,595 semester course enrollments.
	Eight Schools Association Online Initiative	Consortium of boarding schools (Andover, Choate, Deerfield, Exeter, Hotchkiss, Lawrenceville, Northfield Mount Hermon, and St. Paul's) working together to provide supplemental online core and elective courses. The consortium launched first two online courses in summer 2014, and three more in fall 2014.

Note. Notable Operators Currently Providing Courses for the Nation from *Keeping Pace with K–12 Digital Learning, by* Watson, Pape, Murin, Gemin, and Vashaw (2014). Retrieved from http://www.kpk12.com/reports/

Recently the online education world has seen a rise in the number of blended learning programs around the country for several reasons. Research has shown that blended learning can improve student performance, and it has the possibility to be more cost effective than full face-to-face learning (Bernard et al., 2009; Dziuban, Hartman, Cavanagh, & Moskal, 2011; Graham & Robison, 2007; Means, Toyama, Murphy, & Baki, 2013; Shea & Bidjerano, 2010). School districts, private, and charter schools are beginning to realize the impact blended learning can have on their students. The reduction of school budgets, the increase in a technologically based curriculum, and an increase in the teacher shortage situation have all helped to increase the popularity of the blended model (Horn & Staker, 2011). Increasingly schools are using the blended model to not just provide credit recovery courses, but the core and specialized curriculum as well.

Online education has continued to grow outside of the United States as well (Barbour, 2013). In the year 2000, an estimated 25,000 students in Canada enrolled in some type of virtual education (Canadian Teachers Federation, 2001). By 2011, 180,000 Canadian students enrolled in an online course (Barbour & Hill, 2011). Furthermore, 10% of students in Mexico enrolled in some type of online course (Barbour & Kennedy, 2014). All teachers in the country of Singapore receive training on how to teach online. Both China and Mexico now require new teachers to complete some sort of academic training in online education as part of their teaching program (Nagel, 2009).

As an increase in online education has continued, the need for online teachers has increased as well. Though some teachers in the online world have found full-time positions, many continue to work in the brick-and-mortar setting while also teaching online. Dawley, Rice, and Hinck (2010) found that most online teachers have between 7–15 years of teaching

experience in the classroom and many are still teaching full time in a traditional setting as they simultaneously teach online. In Cobb County, Georgia, 80% of the district's online teachers were also full-time classroom teachers during the day (Dessoff, 2009). A similar study found that only 2% of online teachers were brand new, rather most had already taught an average of six to 15 years in the traditional classroom (Rice, Dawley, Gassell, & Florez, 2008).

Research Questions

The intent of the study was to understand what pedagogical practices were used in the online classroom and if pedagogical practices from the online classroom were taken and used in brick and mortar classrooms. The research questions for this study were as follows:

1. What pedagogical practices (i.e., synchronous instruction, asynchronous instruction, teacher feedback, teacher engagement) do online teachers use in their online classrooms?

2. Do online teachers use the same pedagogical practices and tools in both their online classrooms and brick and mortar classrooms?

Description of Terms

Because online education changes the way teachers teach students, there has also been an introduction of new vocabulary into the educational world. Creswell (2015) emphasized the importance of clearly defining terms used in a study. The following is a current list of terms used in this study.

Asynchronous instruction. When learning occurs in different places and at different times. For example, an instructor may send out a recording of a lecture from his class, and students are able to access the recording when they choose. There are several different types of

asynchronous instruction, which can include but are not limited to; recordings, online discussions, e-mails, and modules in an online course (Hidden Curriculum, 2014).

Blended/hybrid learning. This is when courses blend the online classroom with face-to-face or in-person interaction. In blended models, the face-to-face aspect usually occurs in a brick-and-mortar setting, independently from the online learning (Allen & Seaman, 2011).

Brick-and-mortar. Schooling that takes place in a traditional classroom setting. Students interact in a face-to-face manner with their teachers and classmates.

Collaborative online groups. Learning takes place through conversations or dialogue. These groups often communicate through discussion boards, Skype, Google Documents, Instant Messenger, and so on. The goal of the group is to work jointly to solve a problem, discuss ideas, or produce something new (Kirschner & Erkens, 2013; Paulus, 2005).

Face-to-face. When instruction takes place in person between a student and instructor, and in real time.

Individualized instruction. This is basing instruction on individual student needs, abilities, and interests. Often it means individualizing materials and pace of the course to meet specific student needs.

Information and communications technologies. The movement to teach technological knowledge and skills to society. Information and communications technology education is comprised of four main areas; digital learning, infrastructure and support, specialized business use, and research.

Online learning. When learning and instruction take place in an online/virtual environment or when part of the class teaching is online. At times online learning replaces face-

to-face instruction and at other times, it blends with face-to-face instruction (Means, Toyama, Murphy, Bakia, & Jones, 2009).

Online presence. When students perceive the instructor is involved and engaged in the course. An instructor creates his/her online presence by actively participating in collaborative discussions, direct instruction, and frequent, timely communication with students (Garrison & Vaughan, 2008).

Podcast. A digital audio recording made available to play on an audio player or via the Internet (Crews & Neill, 2014).

Synchronous instruction. This term describes interaction and instruction that takes place at the same time but not in the same place and often used within an online classroom. There are several different types of synchronous instruction, which can include but are not limited to; virtual classrooms, Skype, video-conferencing, online learning, webinars, and live chat sessions (Hidden Curriculum, 2014).

Timely feedback. When students receive feedback close to the time of performance, they are more motivated (Anderson, 2008).

Vodcast. A digital, audio/video recording made to play back on a type of player via the Internet (Crews & Neill, 2014).

Significance of the Study

Previous studies have shown effective teaching methods used in online classrooms (Casey & Kroth, 2013; Cheng et al., 2011; Crampton, Ragusa, & Cavanagh, 2012). These studies have shown the impact of online discussions, asynchronous instruction, and teacher communication (Crews & Neill, 2014; Lee, Daniel, & Wee, 2004). It is reasonable to believe that these practices may have a different effect in an online classroom when used by secondary

teachers. Additionally, previous research has compared the academic success of students in an online classroom to those in a brick and mortar classroom (Barbour, 2013). Furthermore, Barbour (2013) suggested that studies in online education have been mainly qualitative concluded a need for quantitative research in this area. Few studies have taken place focusing on the best teaching practices that take place at a secondary level and how these practices carry over into the brick and mortar classroom.

Overview of Research Methods.

The transactional distance theory serves as the foundation for the research and design of the study. The transactional distance theory looks at the issues that can arise in communication and learning when teaching and learning take place at a distance (Moore, 1997). The engagement theory focuses on the potential use of technology for learning and teaching in the classroom.

This was a quantitative study in scope and design. The researcher designed this study using a Likert-scale survey. Prior to the survey being sent out, the researcher took the necessary steps to have it validated. The purpose of this study was to identify what pedagogical practices online teachers used and if these practices carried over into the brick-and-mortar classroom. All secondary teachers were employed by a large publicly traded service provider and were taught in both brick-and-mortar and online classrooms at the same time received the online survey via e-mail.

The participants in this survey worked for a division of a publicly traded service provider. This division works specifically to provide online schooling and class options for districts around the United States. The online company has been providing education to students since 2000. It also provides state-specific virtual academies, private online schools, blended learning opportunities, and several supplemental online learning activities and curriculum. The company

focuses on providing individualized learning to students through online classrooms. Classes offered to include core academic classes, AP and honors courses, career and technical education courses, credit recovery, world languages, and dual credit courses. There is a wide variety of teacher experience among the online teachers ranging from a few months to several years. Teacher's demographics range as well from years of teaching experience to age and gender. The researcher administered the study in the fall of 2016 and analyzed the data during the spring of 2017. The researcher used the general linear model as a tool to analyze the data collected.

Chapter II

Review of the Literature

Introduction

As technology changes, so do the way teachers use it in classrooms. By 2018, studies estimate that the EdTech market will reach $19 billion (Nagel, 2014). In 2013, data accumulated from a study that looked at the trends of technology in education (Pearson, 2014). The study found several students had an increased access to mobile devices, 89% of students had access to smart phones and many of which used them for research (Pearson, 2014). The study also found there has been an increase in using videos for classwork and homework, social media use in the classroom, more schools and districts adopting online learning as a part of the norm, and an increased use of tablets and applications in the classroom (Riedel, 2014).

Schools continue to grow and increase the number of online courses they offer (Archambault & Crippen, 2009; Malinovski,Vasileva,Vasileva-Stojanovska, & Trajkovik, 2014). Reports show that almost one-third of post-secondary students in the United States of America enrolled in at least one online course in 2010 (Gemin et al., 2014). On behalf of the U.S. National Center for Education Statistics, Queen and Lewis (2011) reported that there were 1,816,400 enrollments in distance-education courses in American K–12 school districts during the 2009–2010 school year. This included a 74% growth in high school distance education enrollments as compared to the previous school year (Gemin et al., 2014). One such example lies in the creation and expansion of K12's International Academy. The school started in 2010 with 30 students and today serves over 7,000 worldwide. There has also been a tremendous growth in how school districts utilize online learning (Allen & Seaman, 2011). Figure 2 displays the

number of students enrolled in full-time online courses from each state. Table 1 shows different

E-learning options available to school districts at different grade levels.

Figure 2

States With Statewide Fully Online Schools
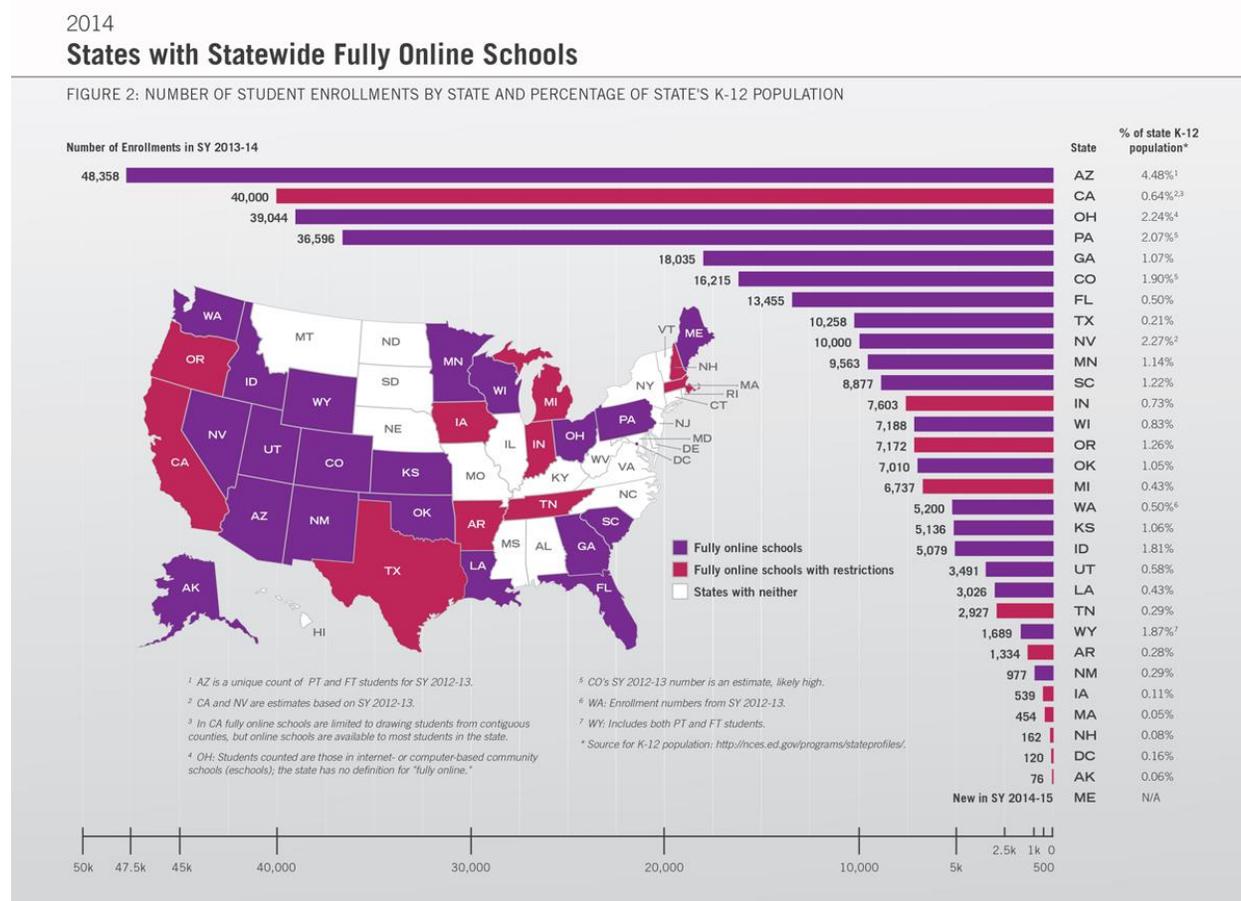
Note. States with Statewide Fully Online Schools from *Keeping Pace With K–12 Digital Learning, by* Watson et al. (2014). Retrieved from http://www.kpk12.com/reports/ Permission for use granted (Appendix A).

Table 1

Digital Options in Online Education

	High School	Elementary School	Middle School
Digital Content	Digital content is often used in a wide range of fully online courses, including core, electives, credit recovery, dual enrollment, and advanced courses. In physical classroom-based courses, digital content and software are widely used to augment face-to-face instruction. Depending on the school, this may be done at the course, department, school, or district level.	Digital content is most often skill-based, adaptive content in math and ELA, and adoptions are usually at the school or district level. Content is accessed by students during regular class time, under the supervision of the classroom teacher.	Digital learning in the middle school includes elements of digital learning in the elementary and high school approaches. For example, in middle schools with sixth grade, they are likely to use skill-based adaptive content in math and ELA. For eighth grade students, however, they may be taking fully online courses taught by an online teacher, often to take high school-level courses. Districts that have chosen to turn around or completely remake a school with a focus on using digital content and tools are often starting with middle school.
Digital Tools	Often a school-wide or district-wide learning management system and student information system are used as base platforms, although certain content may be accessed within its own technology platform.	Usually a course-specific technology platform is used for each subject area.	

Devices	Devices may vary based on the digital options, although across all grade levels, content is increasingly being built for mobile devices. Fully online courses usually still require a laptop or desktop computer. Classroom-based digital content is often accessed on a tablet.	Laptop or desktop computers are used less often than tablets, which are often preloaded with content that is tablet-specific.
Teachers	Online courses are taught by teachers from a distance, with little or no face-to-face interaction with students. Classroom-based teachers may use digital content. Alternative education and independent study programs use a combination of online teachers and onsite mentors.	Teachers are almost always classroom-based and use digital content in their existing class.

Note. Digital Options in Online Schooling from *Keeping Pace With K–12 Digital Learning, by* Watson et al. (2014). Retrieved from http://www.kpk12.com/reports/ Permission for use granted (Appendix A).

As online learning has grown, several different approaches have been taken in the educational system. These educational systems include online charter schools, district-wide supplemental, individual district online schools, statewide supplemental online classes, public and private hybrid schools, and fully online private schools (Allen & Seaman, 2011; Rice, 2006).

Synchronous learning is instruction and collaboration in "real time" via the Internet. Tools used in synchronous instruction are live chats, virtual classrooms, application sharing, virtual whiteboards, virtual hand-raising, and multimedia presentations (Malinovski et al., 2014;

McCarthy, Smith, & DeLuca, 2010; Skramstad, Schlosser, & Orellana, 2012; Strang, 2012).

Asynchronous instruction is the use of time-delayed capabilities in a classroom (Rice, 2006).

These tools often include e-mail, threaded discussion, bulletin boards, and file attachment (Rice,

2006). Figure 3 outlines the umbrella of technology in brick-and-mortar classrooms and online

instruction.

Figure 3

Technology in Classrooms
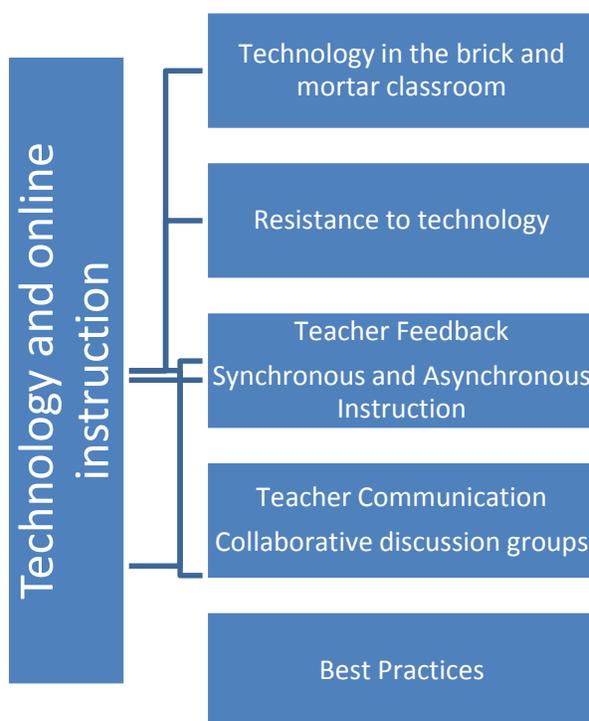
Despite the growth of technology in classrooms and the offering of online classes, several

issues with online education remain. A recent study by Gill et al. (2015) found that 33% of

online courses offered in charter schools around the nation were self-paced, and had no teacher

driven instruction or classmate interaction. In many charter schools, there is limited interaction

with teachers, and there is an expectation that parents will compensate by teaching their students.

The study also found that there was low student engagement and higher student dissatisfaction

ratios in many online charter schools (Gill et al., 2015). Woodworth et al. (2015) found much smaller academic growth in reading and math with students enrolled in online charter schools, than their counterparts in brick-and-mortar classrooms.

Transactional Distance Theory

Moore's (1993) theory of transactional distance is one of the foundations for this study. Moore's framework centers on the study of the interactions that take place during learning. In the case of the transactional distance theory, these patterns and behaviors of learning take place between teachers and students when they are not in the same place, that is, at a distance from one another (Moore, 1993). When teaching and learning take place at a distance, different patterns and behaviors emerge than those in a traditional classroom. Moore explained transactional distance as something that is always changing, rather than an absolute term because the interactions between students and teachers are always evolving (Moore, 1993). He went on to break these themes into three main practices: dialogue, learner autonomy, and structure. The relationship and interaction between these themes ultimately affect the force of transactional distance (Shearer, 2009).

The first component of this theory is dialogue. Dialogue refers to the interactions that take place between all participants; students, instructors, and fellow classmates in an online course. The transactional distance theory relies on the idea as more interactions take place through dialogue; it creates a better learning environment. Interactions should not be one-sided; rather everyone should take ownership in the dialogue and participant (Shearer, 2009). The second component is structure. The structure is the physical program or learning management system where the learning takes place. Moore has found that the structure of the course should be adapted to the needs of students and instructors in the course. There should be a flexibility

woven into the structure of learning, and components that encourage collaboration and

evaluation (Ustati & Hassan, 2013). The final component of transactional distance theory is

student autonomy. Student autonomy refers to the level of engagement and goal setting put forth

by the student in the course (Moore, 1980). In a successful online learning course, students are

encouraged to use high levels of autonomy and given the support to do so (Moore, 1997). See

Figure 4 for a visual representation of transactional distance theory.

Figure 4

Transactional Distance Theory
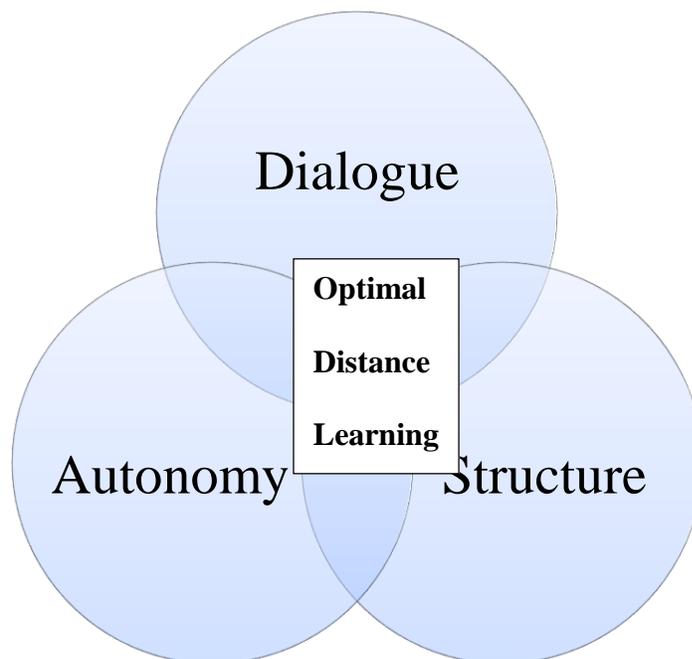
The transactional distance theory stems from constructivist theories of collaborative

learning. Learning activities used in the online classroom usually center on three main areas of

social constructivist theory: collaboration, communication, and inquiry-based activities

(Kirschner & Erkens, 2013). Constructivism influences Moore's beliefs that the online

instructional process (presentation, support of learning motivation, analysis and criticizing,

advice and counsel, application and evaluation, and student centered learning) should be part of the online instructional process (Moore, 1993).

Furthermore, the theory focuses on the impact of the physical and psychological distances in an online learning environment. It is likely that transactional distance negatively influences online classrooms and assignments that require small amounts of dialogue and large amounts of structured learning opportunities. Implementing several concrete practices can greatly minimize the distance between student and teacher. Transactional distance affects fewer online classrooms when they allow for large amounts of dialogue between students, teachers, and classmates, and implement low-structured assignments (Allen & Seaman, 2011). Much research has focused on the use of dialogue and structure in the online classroom. Stein, Wanstreet, Calvin, Overtoom, and Wheaton (2005) used the transactional distance theory to focus their study on the correlation between the satisfaction of online students and the structure of the online course and interaction that took place in the class.

Ustati and Hassan (2013) focused their study on student's perceptions of the learning management system used in an online classroom based around the transactional distance theory. Within the data, three main themes emerged; interactions, assistance, and self-regulated learning. Ustati and Hassan (2013) also used Moore's transactional distance theory to help analyze and understand the themes of their study. Participants in the study emphasized the importance of two-way communication with their instructor when enrolled in online classes and a desire for more interaction with other students in the course. Moore's transitional distance theory is the foundation on which this study is built. This theory supports the use of online best practices such as communication, teacher feedback, synchronous instruction, and collaboration groups.

The engagement theory of learning is the other foundational theory found in this study and is the theory upon which much blended learning is based. The engagement theory developed around a model of learning which takes place in technology-based environments. Kearsely and Shneiderman developed the theory in 1998. Kearsely and Shneiderman (1998) based the engagement theory on motivation and the idea that students are more motivated to work on classes that they find to be meaningful. In order to encourage engagement, classes must have a high level of interest and students should be able to transfer their learning from one context to the next (Kearsely & Shneiderman, 1998).

The three tenants that make up engagement theory are relation, creation, and donation. Learning should take place through activities that promote students working together and encourage discussion over the curriculum. The engagement theory is built on the idea that activities should spark creativity in students and should be purposeful when used in the classroom. This lends itself to students having the opportunity to organize and take ownership in their own projects and learning. Finally, learning should be meaningful, realistic, and tie back to an outside focus for the student. As a whole, the theory promotes working collaboratively among students, project based learning, and an authentic focus in the curriculum (Kearsely & Shneiderman, 1998).

Technology in the Traditional Classroom

As technology has changed the world of education in regards to online teaching, it has also changed education in the traditional classroom. Schools today provide an average of one computer for every five students in the classroom (Herold, 2015). Thousands of articles and studies have addressed the topic of technology in the classroom. Research regarding the use of technology in schools has found that teachers are much more likely to use technology to become

more effective in their jobs rather than providing opportunities for students to have more hands-on activities with technology (Griffin, 2014; Levin & Wadmany, 2008; Teo, 2006).

Two main obstacles that teachers face when integrating technology are (1) not having the resources or training they may need, and (2) their personal belief in the use and effectiveness of technology with their students (Bang & Luft, 2013; Ersoy & Bozkurt, 2015; Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012). In 2015, a study was conducted focused on the use of technology in 21 middle schools and found that "In general, teachers at many schools seemed to view technology as a more valuable tool for themselves than for their students" (Herold, 2015).

Another reason teachers can be resistant to the addition of technology in their classrooms is the amount of time and work it requires (Preston, Cox, & Cox, 2000). Teachers often only integrate technology into the classroom when it fits with the traditional lesson, rather than using it to change the teaching concepts. (Levin & Wadmany, 2008). Many times teacher's attitudes toward technology in the classroom are based on their own personal experience and interaction with the technology (Rana, 2012).

Hew and Brush (2007) studied the obstacles that classroom teachers experience when integrating technology into their teaching. The study identified six barriers separated into first-ordered barriers and second-order barriers, through a meta-analysis of 48 previous studies. First-order barriers include a lack of resources or a supportive culture in the school environment. Second-order barriers are in regards to teachers' views, abilities, and knowledge. The study found that the most common obstacles teachers face are a lack of resources, lack of skills, and personal attitudes and beliefs (Bang & Luft, 2013; Hew & Brush, 2007; Levin & Wadmany, 2008; Rana, 2012; Teo, 2006).

Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, and Sendurur (2012) conducted a study to understand teacher resistance to the use of technology in the classroom. This study found that teachers' own attitudes and beliefs were the greatest reason why they did not use more technology in their classroom. Beyond personal beliefs, the study also found that a lack of technological support and understanding of state standards also influenced how much a teacher chose to use technology in their classroom (Ertmer et al., 2012). The study also looked at what enabled teachers to use technology in their classrooms. In addition to finding that their own beliefs influenced how much they chose to use technology, that when teachers took part in professional development and learning they were given the knowledge and confidence to use technology effectively (Ertmer et al., 2012).

Rana (2012) analyzed teachers' perceptions and attitudes toward information and communication technology. The researcher used two surveys to collect and analyze the data to see if there was any difference in teachers' attitudes surrounding technology based on gender and age. The study found that gender was not a factor that influenced a teachers' perspective, however, it did identify that age was a major influence on a teacher's perception of technology. Younger teachers believe in, and have many unique ways of implementing technology in the classroom; the opposite is true of teachers who are older (Flanagan & Shoffner, 2013; Rana, 2012).

Flanagan and Shoffner (2013) conducted a comparative study between new and seasoned secondary English teachers and their own use technology in the classrooms. The study found that the participants' beliefs about the role and importance of technology heavily influenced their use of technology in the classroom. The seasoned teacher was more likely to use technology to enrich the traditional teaching methods that she had been using in the previous years. The newer

English teacher was more likely to use technology as the basis for her lesson plans, allowing technology to drive the learning in the classroom. All participants discussed a desire for more technological training and acknowledged that their lack of training on a new piece of technology often kept them from using the new tool. Furthermore, technical issues arising were another challenge the teachers faced (Flanagan & Shoffner, 2013).

Levin and Wadmany (2008) collected and analyzed the opinions of teachers on the many aspects of the relationship that exists between a teacher's personal belief in regards to technology, and their interaction with technology. The study focused on participants who used ICT in their classroom over a three-year period. Results showed that at first many participants implemented the use of technology because it was an objective to push by their administration. In the process, participants found that support and dialogue with fellow colleagues was an important part of their implementation. Toward the end of the study, teachers' views changed once again as they personally began to see and understand the importance and success of technology in their classrooms. Teachers also felt more confident in their ability to use technology and were not as apprehensive about using new technology at the end of the third year of the study (Levin & Wadmany, 2008).

Bang and Luft (2013) examined the use of technology in beginning teachers' secondary science classrooms over a five-year period. The most common tool teachers chose to use was PowerPoint in their classroom, and the least common tool used was software. Bell work was the time during the class period in which teachers were most likely to use some type of technology in their lesson (Bang & Luft, 2013). Furthermore, the study found that teachers were more likely to use technology to enhance and assist traditional teaching methods, rather than using technology solely to teach a concept (Bang & Luft, 2013).

The role that technology plays in a classroom varies from using technology to supplement classroom skills to enriching the information presented in class, to transform the teaching that is taking place in the classroom (Ertmer et al., 2012). A common use of technology in today's classroom is enriching the currently presented curriculum. This could range from students creating videos, and blogs, to editing pictures for a project or recording pieces that are relevant to the learning in the classroom. In these instances, the Internet was used to retrieve information rather than used it to promote student interaction and higher levels of thinking.

Technology being used as a transformative influence in the classroom is a new type of teaching and learning and is rare to find in classrooms (Bang & Luft, 2013; Johnson & Adams, 2011). Technology finds new ways to engage students in the classroom through technology and places more technology into the hands of students, allowing their experience with the technology to shape the learning that takes place in the classroom (Ertmer et al., 2012; Flanagan & Shoffner, 2013).

The International Society for Technology in Education (ISTE) has created standards for teachers to use for integration of technology into their classrooms. ISTE's standards are to facilitate and inspire student learning and creativity, design and develop digital-age learning experiences and assessments, model digital work and learning, promote digital citizenship and responsibility, and engage in professional growth (International Society for Technology in Education, 2008). Much of the push toward technology integration in the classroom has fallen under the wide umbrella of Information and Communication Technologies ICT (Levine, 1998).

Moving From the Brick-and-Mortar Classroom to the Online Classroom

There are several concerns when a teacher moves from a traditional classroom setting to an online setting. When moving from the traditional to the online world, many feel like they are

losing control (Griffin, 2014). At times teachers feel overwhelmed because they no longer have the physical communication with their students they have relied so heavily upon in their brick-and-mortar classrooms. Having a lack of eye contact and face-to-face interaction to assess student learning, answer questions, and communicate with students can be a difficult adjustment for teachers to make (Griffin, 2014; Macy, 2006; Rana, 2012). Additionally, there seems to be concern over student accountability and completion of assignments when teachers are not physically present to make sure students are completing all of the lessons or using the assigned resources (Rana, 2012).

Studies have also found that teachers feel they are often not prepared to begin teaching when they enter the online world (Griffin, 2014). These feelings often range from not fully understanding all that their job entails, to not having a sense of preparedness with technology, or not knowing the tools to connect with their students online This can also coincide with new students feeling overwhelmed by the beginning of their online learning experience. Teachers have identified the workload and pressure they feel in the online classroom to be much more than they expected (Griffin, 2014). Often, it takes more time than teachers would like to spend giving the feedback needed, preparing for the online course, and communicating with students. The time involved in planning online lessons is much more than in a traditional environment (Griffin, 2014).

A study conducted by Chiasson, Terras, and Smart (2015) sought to understand the perception of teachers who move from the face-to-face classroom to the online teaching environment. Chiasson et al. (2015) found that teachers felt creating an online course was much more time intensive than developing a face-to-face course. The study also found that teachers felt a shift from teaching others to being more of a guide for students in the online classroom. A

major concern found in the study was that instructors wanted to provide more one-on-one,

effective feedback, and the realization that many of the assignments or activities they used in

their face-to-face course would not be effective in the online environment (Moore, 1997).

Though many of the practices used in both brick-and-mortar and online classrooms are

the same, the role and expectations of an online teacher continues to change and evolve in new

ways (Hawkins et al., 2012). His research has focused on understanding the unique role a teacher

must play in an online classroom as compared to the role they fulfill in a face-to-face classroom.

Because online teaching at a secondary level is relatively new, a survey conducted found that

93% of online teachers had less than five years of teaching experience in the virtual classroom

(Rice & Dawley, 2007).

Dongyun (2014) found that the expectations students may have of their instructor can

change based on the cultural background from which students come. Dongyun (2014) compared

the perception of online Korean students to the perception of other online foreign students. His

research found that the students identified eight essential roles they believe an instructor should

take on: pedagogical, managerial, technical, collaborative, affective, structural, differentiating,

and evaluative. However, the research also showed that foreign students ranked the roles of

pedagogical, managerial, and differentiating roles much higher than the Korean students did.

Figure 5 illustrates a comprehensive list of roles of online teachers, according to Bawane and

Spector (2009).

Figure 5

Roles of Online Educators

Professional (role)
- **Comply with ethic and legal standards**
- **Communicate effectively**
- **Undertake efforts to update knowledge**
- **Demonstrate commitment and favorable attitude**

Researcher
- **Conduct research on classroom teaching**
- **Interpret and integrate research findings in teaching.**

Advisor/Counselor
- **Suggest measures to enhance performance**
- **Provide guidance based on student needs**

Technologist
- **Access various technological resources**
- **Select the appropriate resource for learning**
- **Develop different learning resources**
- **Suggest resources to the students (resource provider)**

Administrator
- **Manage the time and course**
- **Demonstrate leadership qualities**
- **Establish rules and regulations**

Evaluator
- **Monitor individual and group progress**
- **Assess individual and group performance**
- **Evaluate the course/program**

Social
- **Maintain a cordial learning environment**
- **Resolve conflict in an amicable manner**
- **Refrain from undesirable behaviors**
- **Promote interactivity within the group**

Pedagogical
- **Design instructional strategies**
- **Develop appropriate learning resources**
- **Implement instructional strategies**
- **Facilitate participation among students**
- **Sustain students' motivation**

Teacher Feedback

One tool often used in online learning has been teacher feedback. Research has shown that when timely and productive feedback is given, students feel more engaged and connected in their online course (Barbour, 2008; Casey & Kroth, 2013; LaBarbera, 2013; Ni & Aust, 2008; Skinner & Peters, 2012; Skramstad et al., 2012; Yu-Chun et al., 2014). Petrides (2002) found that students are often dissatisfied with amount of time it takes to get feedback online, as compared to the face-to-face feedback they would have received in a traditional classroom. Another study conducted by Hara and Kling (2000) shows that students are often frustrated by the amount of time it takes to provide feedback in an online course. Teacher feedback can come in several different forms: comments on a paper, providing students with recordings that discuss their assignments, or setting up online conferences of phone calls to provide feedback on assignments (Hara & Kling, 1990).

According to a study conducted by Ni and Aust (2008), there is a direct correlation drawn between the immediacy of student feedback and the overall satisfaction of students in the course. Ni and Aust (2008) also looked at the impact of direct verbal immediacy from a teacher and the increase in a student's willingness to ask questions and reach out for help in a class when needed. The more a student felt the teacher was responding to their questions in a timely manner, the more likely a student was to ask follow up questions and be engaged in the course (Ni & Aust, 2008).

Skinner and Peters (2012) conducted a study with 30 online students in two different Introduction to Psychology courses. In the final week of class, students took a survey that assessed the online instructor's teaching presence in class, their social perception of the class, their cognitive presence, and their perceived learning and satisfaction (Skinners & Peters, 2012).

The study aimed to research types of teaching and learning in an online classroom and the overall satisfaction of students in the course. The study found that the stronger the perceived teaching presence, often in the form of student feedback, the more cognitive learning and social engagement students had in the course (Skinners & Peters, 2012). Skramstad, Schlosser, and Orellana (2012) also found that the quicker the feedback given, the more students perceived their instructor was engaged in class. Students placed a great value on timely interactions and productive feedback from their instructors (Skramstad et al., 2012). One of the main areas each instructor focused on was the learning relationship between student and instructor.

Casey and Kroth (2013) set out to find experienced online teachers ranked as excellent by their deans. They interviewed eight online instructors and reviewed their syllabi to discover which practices used were most effective in the online classroom (Casey & Kroth, 2013). The research found the main ways instructors supported students in a learning relationship was by thorough and timely teacher feedback (Casey & Kroth, 2013). In addition to supporting students with feedback, students at Golden Gate University reported a stronger sense of engagement when students received quality feedback from their instructor in a timely manner (Lim-Fernandes, 2001).

The Lim-Fernandes (2001) study centered on data collected from online students in the public administration program and focused on the students' perceived idea of how prepared the instructors were for teaching their online course. Providing timely feedback was one of the main factors students identified in effective instructors. Barbour (2008) also identified lack of immediate teacher feedback as a main concern for online students. Crews and Wilkinson (2012) conducted a study that concentrated on finding out what the effective methods were to provide feedback to students' writing assignments in an online classroom. Crews and Wilkinson (2012)

found that handwritten feedback was the least helpful to students and audio and visual feedback given through the computer or a recording was the most helpful type of feedback teachers could provide on a written assignment. Although students appreciated the auditory and visual feedback the most, they also wanted their papers returned to them so that they could take notes on their assignment while listening to or watching the feedback (Crews & Wilkinson, 2012). The auditory and visual feedback also provided students the opportunity to listen to their feedback more than once if they so desired and provided more in-depth comments and insight to the feedback given.

Gallien and Oomen-Early (2008) researched the effects of student performance and satisfaction in a course correlating with the type of feedback received. During the study, the participants split into two separate groups, one, which received personalized feedback on their assignments, and another, which received collective feedback on their assignments. Overall, the research showed that on average students who received individualized feedback performed better than those who received general feedback. The students who received individualized responses were also more satisfied with the class, but did not necessarily feel more engaged with their instructor than those who had received general feedback (Gallien & Oomen-Early, 2008).

LaBarbera (2013) focused her study on the correlation between a student's sense of connection in a course and their academic achievement in the course. This study found that the students' perceived connection directly correlated with their interactions with the instructors, both around course content and personal e-mails. There were also strong correlations between the instructors perceived level of support and the timeliness of the feedback given. As a whole, students who corresponded with their instructors through e-mail about assignments were more

satisfied with the course and felt more connected to their instructor than the group of students who did not (LaBarbera, 2013).

Synchronous and Asynchronous Instruction

Synchronous instruction and asynchronous instruction are powerful tools in the online classroom. Synchronous (real-time) and asynchronous (anytime) tools can be utilized in virtual courses as a means to engage students (Barbour, 2008; Crampton et al., 2012; Crews & Neill, 2014; Lee et al., 2004; Skramstad et al., 2012). Asynchronous tools provided virtual students the flexibility to read, listen, type, and engage in course activities according to their own schedules (Crews & Neill, 2014; Karsenti & Collin, 2011). In asynchronous discussions, students may take additional time to think through topics prior to responding as compared to the sense of urgency to respond in face-to-face discussions. Synchronous instruction is also used as a way to provide students with feedback and lectures over the topics covered in the course (See Figure 6). Teachers often use synchronous and asynchronous tools in the virtual classrooms such as podcasts or vodcasts (Crews & Neill, 2014; Watters & Robertson, 2009; Zhang & Zhou, 2003).

Figure 6

Compare and Contrast of Asynchronous Instruction to Synchronous Instruction

Asynchronous Learning

- Recorded lectures
- Course work can be accessed and worked on at anytime
- Discussion boards
- Social networking
- E-portfolios
- Collaborative documents
- Continous Access to Course Work

Synchronous Learning

- Live lectures
- Student and Instructors online at the same time
- Space to chat with other students
- Provides video or web conferencing
- Live podcasts

Ertmer et al. 2012 reported that asynchronous and synchronous tools are complementary as teachers can distribute information and assign tasks prior to online lectures. Synchronous tools were less flexible as they were in real time, although Skylar (2009) reported that many online courses had recorded synchronous sessions for students who were unable to attend during the allotted time of a live session. Recordings, in effect, had the potential to offer synchronous lectures in asynchronous format virtual courses to meet flexible scheduling needs of students (Skylar, 2009). Karsenti and Collin (2011) found that students felt a significantly higher amount of self-efficacy after viewing the recorded teaching videos in their online class. Students also felt that they had a more practical knowledge on how to apply theories in the classrooms after viewing the recordings. The study also found that the recording provided them with a bigger

sense of freedom and flexibility in their online learning class because they were able to view the

recordings whenever and as often as they liked (Karsenti & Collin, 2011).

Laffey, Lin, and Lin (2006) utilized two surveys on 107 postsecondary students enrolled

in at least one online undergraduate course to evaluate the construct of social ability in an online

learning environment. Laffey et al. (2006) suggested that increased opportunities for social

interactions were positively associated with learning satisfaction and intentions to use technology

to complete course work. Laffey et al. (2006) implied that when students connect with peers in a

virtual course, there was less need for teacher presence to foster a sense of community. One such

connection place can take place during an asynchronous class.

Crews and Neill (2014) surveyed 80 online secondary students to understand their

preference of asynchronous instruction in a course. The study gave students five different

delivery options in podcasts or vodcasts, using varying degrees of a teacher's appearance and

voice. Findings from the survey revealed that students preferred a vodcast method of

asynchronous instruction where the teacher's face was visible, both in live instruction and in

recordings (Crews & Neill, 2014). The studied concluded that students prefer asynchronous

instruction in an online course to less-interactive synchronous instruction.

Parenti (2013) concentrated on what student perceptions of web-based learning were in

an online course, with a focus on the use of synchronous tools in the online classroom. The

research showed that students gave high ratings to the use of the synchronous tools Adobe

Connects Class Time and Chat Pods. Both of these tools provided an audio/video conferencing

tool for students to use within the course to chat with each other as well as with their instructor.

These synchronous tools also provided immediate teacher feedback in the course. The

synchronous tools rated highest in the study were those provided real time interaction with other

participants in the course (Parenti, 2013). A study conducted by Yamagata-Lynch (2014) found that students should be familiar with the synchronous tools they are using prior to the start of the synchronous sessions, and they must receive some sort of training to use them effectively

Strang (2012) conducted a study that observed the impact of synchronous instruction on students' grades. Strang's (2012) results supported his hypothesis: that grades from the synchronous discussion group were significantly higher than the grades from students who were in the asynchronous discussion group. Students in the synchronous group not only performed higher overall on their weekly graded assignments, but on the final for the course as well (Strang, 2012). The research showed that students were more likely to come prepared to class when there was a synchronous discussion in which they would have to participate.

Malinovski, Vasileva, Vasileva-Stojanovska, and Trajkovik (2014) performed a study of secondary students' subjective experiences in an online classroom with synchronous and asynchronous instruction. Malinovski et al. (2014) found that a student's motivation was the highest predictor of how they would experience the synchronous and asynchronous sessions, compared to the other variables in the study on technical performance, like a student's attitude or ease of usage. Furthermore, technical problems that students experienced did not seem to influence their overall attitudes toward the synchronous sessions. The study did show that students appreciated teacher interaction and the ease of following a lesson during these sessions (Malinovski et al., 2014) see Figure 7.

Figure 7

Different Types of Asynchronous Instruction

Podcast, audio only	Vodcast, audio and video, no "talking head" shown	Vodcast, audio and video, "talking head" shown
	Vodcast showing a written analysis example without a "talking head"	Vodcast showing written anlaysis with a "talking head"

Lee, Daniel, and Wee (2004) also investigated how to engage online learners in a media rich course. In 2003, Nanyang Technical University in Singapore began to shift more than 90% of their classes to an online format. The university realized that to be effective in this move they needed to identify ways to humanize the online classroom and encourage interaction between the student and instructor. One of the main instruments they focused on was asynchronous instruction and having a recording library available to students. Of the students surveyed, 93% felt that the library housing recorded sessions in class was a useful and desired feature of the course (Lee et al., 2004). Students felt more engaged in a course when they have access to previous live teacher recordings (Zhang & Zhou, 2003). Barbour (2008) looked at the same issue and found that secondary students identified the use of a virtual synchronous and asynchronous classroom to be the most beneficial tool used in the offered course.

Menchaca and Bekele (2008) used online graduate education students for their study focused on technologies, optimal learning environments, components for success, strategies, prerequisites knowledge, and learning or teaching experiences in their online course. Menchaca and Bekele (2008) found that students felt that having multiple technological tools in the course was very important for the success of the class and their overall learning and ranked asynchronous and synchronous tools as the most important tools used in class. Furthermore, faculty members also believed that a combination of synchronous and asynchronous communication were important for the overall success of the course (Menchaca & Bekele, 2008).

Teacher Communication

Communication between a teacher and students is one of the main areas of engagement in the online classroom (Barbour, 2008; Casey & Kroth, 2013; Crews & Neill, 2014; Ni & Aust, 2008; Skramstad et al., 2012; Tsai, 2012). Crews and Neill (2014) noted in their research that students listed the lack of interaction between themselves and the teacher as a major negative.

Online communication may take on many different forms, including e-mails sent, phone calls, Skype, Instant Messenger, e-cards sent, daily announcements posted in class or live study hall hours being offered to students (Crews & Neill, 2014). Students respond just as positively to the promptness of teacher communication as they do to timelines of teacher feedback (Crews & Neill, 2014; Hodges & Cowan, 2012).

Barbour (2008) initiated a study that asked online secondary students about their perceived benefits and challenges of learning in an online classroom. Students in the study identified e-mail communication with their instructor as an important tool offered in the class, second only to the use of a virtual classroom to communicate with their teacher. Barbour (2008) also identified that one of the main problems a student had in an online environment was a lack

of immediate response from teachers when student issues arose. Hodges and Cowan (2012) discovered that students in an online course have a perceived idea of what an appropriate response time for communication and student feedback should be. The study also found that many students valued instructors who were available during set office hours or by phone when needed.

Skramstad et al. (2012) researched students' perceptions of a teacher's presence and the impact of timely communication in an online course. Of the students surveyed, 36% had previously taken an online course. The first piece of data collected was a survey with questions pertaining to the teacher's presence in the course. The second set of data collected looked at the communication recorded by the learning management system. This data included questions posted in the course by students for the instructor and e-mails sent back and forth. The study expected that instructors communicated with and returned feedback to students within 24 hours after a request. Many practical and theoretical implications came from this study (Skramstad et al., 2012). First, the research showed that most participants were turning in work or initiating communication with their instructor between the hours of 4 p.m. to 7 p.m. This led to the conclusion that these times of the day are when an instructor should be available for communication with their students (Skramstad et al., 2012). The study also found that the participants placed a high value on timely interaction and communication with their instructor. Students showed less overall satisfaction with the course when there was a longer lag time in communication with the instructor (Skramstad et al., 2012).

Ni and Aust (2008) completed a study with a similar focus on the correlation between verbal immediacy from an instructor and the student's perceived learning and general satisfaction in the class. Casey and Kroth (2013) specifically looked at how experienced faculty

had gone about creating a strong presence online. They extensively interviewed and reviewed the syllabi of eight experienced and excellently rated faculty members. During the study four main patterns emerged from the data collected in the areas of relationships, working in group/student directed learning, communication, and organization. One of the common themes mentioned by all participants was the importance of ongoing and consistent communication with the students enrolled in class, and being able to quickly provide a sense of support for their students when needed (Casey & Kroth, 2013). Skramstad et al. (2012) concluded that there is a significant correlation between a sense of teaching presence in an online classroom and the quickness of communication.

Lear, Isernhagen, LaCost, and King (2009) studied the relationship between instructor presence and student engagement in the course. Lear et al. (2009) focused on the presence and effectiveness of different types of course interactivity: social/relational building, instructional activity design, technology resources, and instructor engagement. Instructor driven interactivity with students was the most effective for engaging students. Specifically, the research showed that key activities placed at the beginning of the course were the most important.

Research by Lim-Fernandes (2001) also supports the importance of communication in an online course. The study compared student's satisfaction in a face-to-face course versus the satisfaction of students taking the same course online. One of the aspects the study focused on was what drove the overall satisfaction of online students at Golden Gate Universities. Findings show that the students appreciated virtual office hours held by each instructor (Lim-Fernandes, 2001). They provided a set time when students knew their instructor would be available for live questions, communication and feedback (Lim-Fernandes, 2001). One instructor, in particular, e-mailed students when they failed to turn in an assignment and communicated well if students ran

into scheduling problems with the course. Other students found that instructors who e-mailed students back right away and were always available to e-mail in a timely manner. A major conclusion this study made was that online students are just as satisfied with the communication in their online class experience as their face-to-face counterparts (Lim-Fernandes, 2001). Lim-Fernandes (2001) also found that while in-class students based much of their interaction and connection to the teacher through face-to-face delivery and teacher personality, those online based their connection on the quality and quantity of teacher e-mails, online instruction, and interaction with other students as a whole (Lim-Fernandes, 2001).

Chaiprasurt and Esichaikul (2013) focused their study on what type of communication tools are effective when used in an online course. The study compared two groups of students, one that had access to the course through mobile communication tools such as text messages and Moodle, and another group not given access to the course through mobile devices. The study found that students who had access to the course through a mobile communication tool were more likely to engage and participate in the course. Students in the group with access to the mobile communication scored higher on their weekly graded assignments than the other group. However, there was no significant difference in the final scores for each group (Chaiprasurt & Esichaikul, 2013). The research did find a significant gain in the motivation of students who used the mobile communication in comparison to the group who did not.

Velasquez, Graham, and West (2013) chose to conduct a study with staff and students of an online high school. The study focused on the staff who had demonstrated a large amount of caring for students, and what methods they used to care for the online students. Velasquez et al. (2013) identified several practices that helped to create a caring online classroom environment. Both students and teachers preferred using technology that allowed for continuous

communication such as Skype, Google Chat, phone, and e-mail. Students also felt cared for when there was promptness in communication through various forms (Velasquez, Graham, & West, 2013). Students also felt a stronger connection to their teachers when teachers initiated dialogue with their students, rather than waiting to respond to a question. Teachers preferred the use of face-to-face technology tools, such as web cams, which allowed them to read the non-verbal cues of their students (Velasquez et al., 2013). A study completed by Koenig (2010) found that when students felt a lack of interaction and personal contact with their instructor it produced an overall lower sense of satisfaction in the online course as compared to one that is a face-to-face course.

DiPietro et al. (2010) focused their study around a group of teachers from Michigan Virtual Academy. All participants had been teaching online for at least three years prior to the study. The study found that communication with their students was more effective when teachers used a variety of methods such as telephone, e-mail, and instant messenger. It also found that a major motivating factor in the course was providing quick feedback to students (DiPietro et al., 2010).

Online Collaboration Groups

Collaboration groups are another tool often used in the online classroom. These groups can provide a place for student interaction and further instruction in the course (Wu, Bieber, & Hiltz, 2008; Yu-Chun et al., 2014). Collaboration groups can take on many different forms including groupware, discussion boards, blogs, or the use of Google Docs and Instant Messenger. The overall goal of collaboration groups online is to increase student engagement and learning in the course (Adie, 2012; Moon-Heum & Scott, 2016; Ni & Aust, 2008; Tsai, 2012; Wu et al., 2008; Yu-Chun et al., 2014).

One collaboration tool often found in an online course is discussion boards. There are several advantages that have been found when online discussion boards are used in the classroom (McCarthy et al., 2010). These include the following:

1. They give students an area to interact with fellow students. This research has found that students are more inclined to engage in a discussion that takes place online rather than a face-to-face (Smith, Smith, & Boone, 2000).

2. Online discussion boards provide a copy for instructors to use as a gauge for student understanding, participation, and grading (Blankson & Kyei-Blankson, 2008; Christopher, Thomas, & Tallent-Runnels, 2004).

Tsai (2012) performed an in-depth look at online collaboration groups in the form of discussion boards and the overall impact on performance when teachers are involved in the discussion boards. Tsai (2012) designed the study to be made of three experimental groups of students, each group receiving a different amount of teacher engagement in the discussion board. Research found that the groups in which the teacher initiated collaboration learning engaged in more discussion than the group with less teacher involvement (Tsai, 2012). Tsai's (2102) study produced research in regards to the outcome of online collaborative learning with initiation and student regulated learning. Ultimately, without the initiation and involvement of teachers in collaborative learning, students are more likely to discuss and collaborate in a more ineffective manner, or not engage in the discussion at all. Blankson and Kyei-Blankson (2008) found that the online discussions in their study increased overall classroom participation and 93% of the students agreed that online discussions helped them engaged in the course. The study also found that synchronous online discussions help students engage in the class and at times hold them accountable for their learnings. Students used this required synchronous discussion time to ask

questions, find answers, and review course material. Adie (2012) conducted a similar type of

study and found that the cultural, social and historical contexts play a big role in the use of

moderated discussions that requires consideration. Adie (2012) concluded that moderated

discussions can be used as a means for teachers to extend their learning and practice in the online

classroom.

Yu-Chun, Walker, Belland, Schroder, and Yu-Tung (2014) researched the relationship

between predictors in a course, such as learner-to-learner interaction and their correlation with

overall student satisfaction. Most students in the study believed that they had an adequate

amount of interaction with fellow students and their instructor in the course through the

discussion boards and asynchronous instruction times. The study found that the more a student

interacted with fellow students in the course and the instructor interacted with them, the more

satisfied students became with the overall course (Yu-Chun et al., 2014). Kirtman (2009) also

focused his research on the use of traditional teaching methods in the online classroom. The

research showed that online students prefer the use of discussion boards. Participants in his study

asked for an increase in small and large group discussion opportunities in their courses.

Furthermore, Akcaoglu and Lee (2016) found that students perceived a higher level of social

presence in small and permanent online collaboration groups.

Additionally, Smith, Smith, and Boone (2000) focused their study on the comparison

between the instructional methods in the classroom and the same instructional methods used

online. The study consisted of a group of students taking classes online and a group of students

taking the same classes in a traditional classroom. The study showed that communication with

the instructor in the online classes seemed stronger than in the face-to-face classes (Smith et al.,

2000). The research summarized that online students were more likely to ask questions and

participate in online discussion groups than in the traditional classroom setting (Smith et al., 2000).

Christopher, Thomas, and Tallent-Runnels (2004) completed a study that looked at the cognitive levels of engagement in discussion boards in online classes with graduate education students. Christopher et al. (2004) found the majority of the discussions fell at the medium thinking level of cognitive engagement. The research also showed that certain students were prone to use higher levels of thinking in their discussions when compared to other students. The study found that there was not a direct correlation between the level of thinking presented in the discussion prompt and the level of thinking in the response to the prompt. There also did not seem to be a change in the level of depth students chose to discuss in a prompt and their increase in knowledge (Christopher et al., 2004).

When instructors utilize discussion boards in large classes the number of discussion posts can be overwhelming for both students and instructors in the course. McCarthy, Smith, and DeLuca (2010) also found that when students took part in large discussion groups they often felt that they had nothing new to add to the conversation. The same situation can also create a vast amount of work for an instructor to get through, grade, and respond to each student's post (McCarthy et al., 2010). Research also shows that it is more difficult for instructors to be involved in several small group discussions rather than one long discussion (McCarthy et al., 2010). Furthermore, Romeo (2001) has suggested that discussion boards may lead to lower levels of thinking and less cognitive discussions that may take place in a face-to-face classroom. See Figure 8 below for a visual comparison.

Figure 8

Advantages and Disadvantages of Online Collaboration Groups

Advantages	Disadvantages
•Class interaction	•At times they only produce low-level thinking
•Ideas added to the course	•Not "work at your own pace"
•Real life examples	•More work for instructor
•Able to reflect on concepts presented in course	•At times can be overwhelming for students
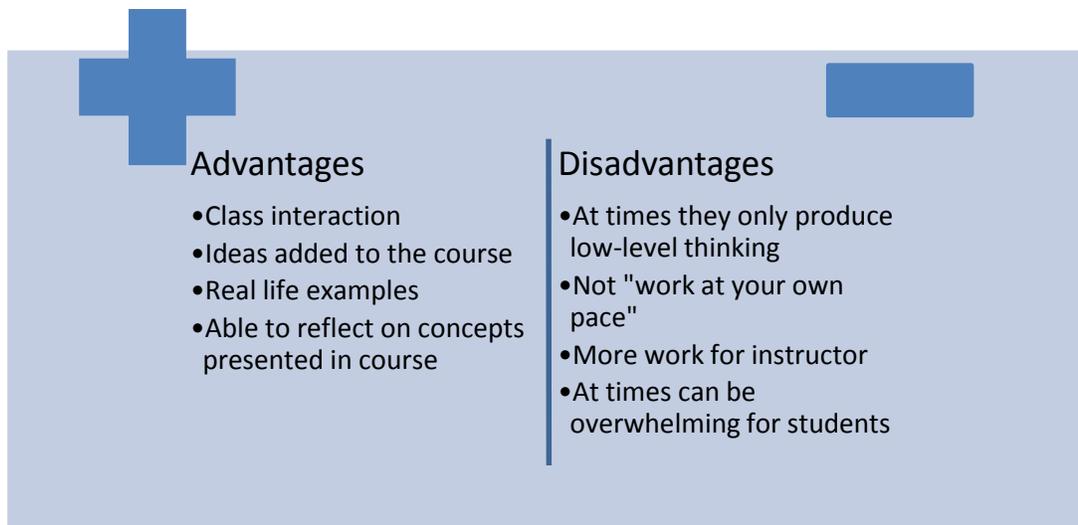
Best Practices in Online Education

There has been much research conducted on the best practices for teaching online. These best practices include organization in the online classroom, the use of syllabi, and the impactful perceived presence of an online course instructor (Skramstad et al., 2012; Velasquez et al., 2013; Yu-Chun et al., 2014). Collected data also support a correlation between an instructor's presence in the course and student performance (Bigatel, Ragan, Kennan, May, & Redmond, 2012; Bush et al., 2010; Chang, Hun-Yi, & Zhi-Feng, 2014; DiPietro et al., 2010).

Bigatel, Ragan, Kennan, May, and Redmond (2012) focused their study on 197 online higher education instructors and their best practices, the study produced several findings. First, the research found that the instructors believed it was important to personalize the class they were teaching for the specific group of students to meet the student expectations (Bigatel et al., 2012). Instructors took the time to tailor the standard course shell given to them and make it specific to each class. Second, the instructors cited that open-ended and problem-based work that promoted class collaboration were the most effective learning activities (Bigatel et al., 2012).

Third, instructors identified a need to "connect" with their students, a part of this included

quality feedback, response time to communication, and establishing a caring approach for their

students (Bigatel et al., 2012). The research found that instructors believed these practices

increased the overall success of their online courses (Bigatel et al., 2012). Lee et al. (2004) also

found that 51% of the students in their study spent one to five hours a week in their learning

management system. Likewise, 52% only logged in for an hour a week. Time spent in courses

can affect the sense of connection for students in the course (Lee et al., 2004).

Bush, Castelli, Lowry, and Cole (2010) researched the presence of the community of

inquiry model in online university courses. The research showed that a teacher's presence in a

course significantly relates to the overall satisfaction and knowledge students felt they gained

from the course. Consequently, students who perceived a low level of teaching presence were

strongly dissatisfied with their course and the knowledge gained from it (Bush et al., 2010). The

data also suggested that students might have the best learning experience in a blended course

when part of the class takes place face-to-face and online.

DiPietro et al. (2010) researched the best practices of teachers at Michigan Virtual

Academy, where all teachers used in the study had been teaching for at least three years online.

The researchers wanted to identify some of the best practices of online secondary teachers. The

study found that 23 pedagogical strategies emerged from the data after an in-depth analysis of

the interviews with teachers (DiPietro et al., 2010). One of these best practices identified from

this data was to monitor and observe student academic progress on a regular basis. Teachers felt

this practice helped to keep them connected to students and increase their online teaching

presence (DiPietro et al., 2010). These participants also identified with establishing their

presence in a course as an important practice. They accomplished this by providing swift

responses to students, being active in the collaborative groups, and logging into their classroom

on a regular basis. Furthermore, they used multiple strategies to create relationships with

students and understood that these relationships affected student success in the course (DiPietro

et al., 2010).

Another study by Casey and Kroth (2013) focused on the importance of a complete and

thorough syllabi provided by the instructors for students in an online course. The study compared

instructors teaching face-to-face courses and the same course offered online. They found that

instructors ultimately believed that an online course might take more work to prepare and teach

than face-to-face courses (Casey & Kroth, 2013). However, they realized the importance of

having thorough guidelines and instructions provided for all their students, posted both in the

course and in their syllabi. Cole, Shelley, and Swartz (2014) found that the way a course was set

up also influenced student satisfaction. On average, 8% of students in the course were

dissatisfied with how the instructor facilitated the course. Furthermore, overall dissatisfaction

with the online course came from lack of interaction and communication with the instructor

(Cole, Shelley, & Swartz, 2014).

Blended Learning

The International Association for K–12 Online Learning organization (iNACOL) defines

blended learning as the advantages of online education combined with the features of brick-and-

mortar classrooms (Powell, Rabbitt, & Kennedy, 2014). Generally, blended learning

environments provide students with access to teachers for face-to-face instruction and yet

students are able to work through the curriculum at their own speed and interest. See Figure 9 for

a list of different types of blended learning models (Powell et al., 2014). Research has shown that

blended learning has the potential to improve student engagement and performance (Bernard et

al., 2009; Dziuban et al., 2011; Graham & Robison, 2007; Means et al., 2013; Shea & Bidjerano, 2010).

Figure 9

Different Types of Blended Learning Models

Rotation Model: Any course or subject when students rotate through brick-and-mortar and online learning models.

Flex Model: Online learning is the basis for learning; students work mainly online in a brick-and-mortar setting with a teacher present to answer questions that arise**.**

Blended Learning Models

A La Carte Model: The entire course is taken online. The teacher may be onsite or online. Students are taking other classes at a brick-and-mortar school at the same time.

Enriched Virtual Model: Students have required face-to-face time with their teachers and then complete the rest of the course online remotely.

Sobhy and Megeid (2014) identified the advantages of blended learning contrasted with a traditional online course as the following: more flexibility, ease of access to the curriculum, higher success rates than online courses, and a sense of community and connection is often created for students. Their study identified that students were satisfied as a whole with the option of taking a blended learning course in comparison to a fully online course. The study also found that students were willing to take responsibility for their own learning in the course but also need the support of face-to-face teachers to be successful (Sobhy & Megeid, 2014).

Chang, Hun-Yi, & Zi-Feng (2014) also focused their research on the performance of students enrolled in a blended learning course versus a traditional face-to-face course. Half of the 11th-grade students enrolled in a blended learning electrical engineering course, the other half

enrolled in a traditional electrical engineering course. The study found that there was no difference in academic performance between the two groups. However, the study found that those students enrolled in the blended learning course scored higher on their self-assessments. Research showed that blended learning courses can develop student self-assessed learning engagement (Chang et al., 2014).

In a study conducted by Alijani, Kwun, and Yu (2014) researchers focused on the benefits of implementing blended learning within an already existing K–12 face-to-face program in New Orleans, Louisiana. All of the schools that took part of the study consisted of primarily minority and high needs students. Data collected from the study showed that 45% of the students believed that blended learning provided a higher quality of education when compared to face-to-face learning. Furthermore, 94% of the students believed that blended learning could lead to higher levels of academic learning and student success (Alijani, Kwun, & Yu, 2014).

Conclusion

Research has shown the extensive growth of technology in the brick-and-mortar classroom as well as the overall growth in the number of teachers in online classrooms. Often teachers' personal beliefs or lack of training and skills can make them resistant to the use of technology in their brick-and-mortar classrooms and their online classrooms (Hew & Brush, 2007; Levin & Wadmany, 2008; Rana, 2012).

Research has also shown the importance and effectiveness of using online teaching practices when teaching in the online classroom (Bigatel et al., 2012; Casey & Kroth, 2013; Watters & Robertson, 2009). Timely teacher feedback helps with the engagement and success of students in an online course (Skramstad et al., 2012). Asynchronous and synchronous instruction can be used as tools to engage students and increase perceived teacher presence in the classroom

(Skylar, 2009). Collaborative discussion forums allow students to interact with fellow classmates and provide them with a space to ask a question in the class (Smith et al., 2000). Teacher communication is extremely important to students and impacts their perception of teacher engagement in a classroom and best practices include logging daily into class and providing thorough and concise instructions in the course (Arbaugh & Hwang, 2006). Blended learning continues to be on the rise and an important part of online learning today (Alijani et al., 2014). All of these practices and tools when used correctly can create an online environment where students can be successful. As the use of technology continues to revolutionize our classrooms and online education grows and develops, there is a continued need for research into both of these areas.

Chapter III

Design and Methodology

Introduction

The purpose of this non-experimental quantitative study was twofold: first to gather data about what pedagogical practices secondary online teachers are using, through creating and validating a new survey. Second, the researcher hoped to find whether a relationship existed between pedagogical practices used in the online classrooms and those used in the brick and mortar classroom. Black, DiPietro, Ferdig, and Polling (2009) conducted a similar qualitative study of successful practices in virtual schools in the upper Midwest of the United States. Sixteen participants took part in the study and the researchers found there were general characteristics that could be associated with the best practices of online teachers. They called for further research and study on a larger group of online teachers, from throughout the United States.

There are multiple factors that influence the success of students in the online classroom. Many studies conducted on these factors have taken place in postsecondary classrooms, and the results have shown that teacher participation, communication, instruction, and feedback have significant influence on student success and satisfaction in the online classroom (Casey & Kroth, 2013; Cheng et al., 2011; Crampton et al., 2012). Furthermore, as there has been an increase in the teaching of online classes and brick-and-mortar teachers teaching classes in the online world, questions arise about a transfer of best practices from the online into the brick and mortar classroom. This chapter focused on the description of research methods used in this study and the questions that guided this study. Below were the research questions for this study:

1. What pedagogical practices (i.e. synchronous instruction, asynchronous instruction, teacher feedback, teacher engagement) do online teachers use in their online classrooms?

2. Do online teachers use the same pedagogical practices and tools in both their online classrooms and brick and mortar classrooms?

Research Methods and Design

The researcher used a quantitative methodology to answer the research questions for this study. Quantitative studies can provide analyzed data to understand preference trends and the differences between groups (Creswell, 2015). Survey research also provides trends about specific populations by analyzing a portion of the population (Creswell, 2015). The first goal of this study was to identify the pedagogical practices used by online secondary teachers. The secondary goal was to understand if online teachers take pedagogical practices used in their online classroom and apply them to their brick-and-mortar classroom. Descriptive research often uses the survey method to conduct research, which allows researchers to sample a portion of the population and infer characteristics about the population based on the sampling (Creswell, 2015; Johnson & Christensen, 2000).

The researcher created and validated the survey for this study in 2016 (see Appendix B). The researcher created the survey questions based on the research of best practices in the online classroom (see Appendix C). Using Black et al.'s (2009) methods for designing questions, this study consisted of demographic questions and elicited pedagogical practices used in the subjects' online classroom and brick-and-mortar classroom. The researcher asked participants to answer the pedagogical strategies portions of the survey using the Likert scale and open-ended questions. The online survey was created using Qualtrics (2016) software. The survey was

validated over the summer of 2016 by gathering the feedback on the survey from 8 teachers who were experts in the field of online education. In the fall of 2016, the teachers received an electronic version of the survey. Over 200 teachers received an e-mail asking them to participate in the online survey. If they chose to take part in the study, their e-mail address was entered into a drawing for two $50 Amazon gift cards. The drawing took place one week after the survey closed. Participants provided consent electronically by choosing to take part in the survey in Qualtrics and were not penalized if they chose to not take part in the study.

Validation of Survey Instrument

The researcher developed the survey based on domain identification, item generation, and instrument formation (Lynn, 1986). In order to test the scale of validity of the survey, the survey was piloted with a small sample of 10 subjects and demonstrated an Alpha Cronbach of .785. To test validity, the survey was presented to eight experts in the field of online education. These experts rated each question on a 5-point scale to calculate the item content validity index (I-CVI). The 4-point scale the experts used were as follows: Likert-scale: 1—never, 2—rarely, 3—occasionally, 4—a moderate amount, and 5—a great deal. Any question with a S-CVI of .9 or higher was a valid question and used in the Qualtric survey. Based on the tests of scale validity, the survey was deemed acceptable for use within the study.

Participants

Participants in this study were teachers whose primary teaching assignments were grades 6–12 and who taught in both the brick-and-mortar setting and the online setting. Specifically, these teachers were secondary online teachers employed by a large publicly traded service provider of online education. Teachers ranged from contractors to status to full time status and various blends in between. A large majority of the contractors in the division also taught full-

time in brick-and-mortar schools around the nation. In order to work for the company, all teachers must hold a current teaching certificate. They must also meet the highly qualified requirements of subject certification in their state. The publicly traded company uses three main learning management systems as their virtual classrooms: Blackboard and the Brightspace learning management system.

Upon hire, teachers receive 20 hours of online training. The training covers the learning management system assigned to the teacher, the use of Blackboard Collaborate as a virtual classroom, data-driven instruction, compliance, and an overall assessment. Teachers learn tips and tricks for how to 1) motivate students in an online classroom, 2) work with students and parents at a distance, and 3) use technology as a whole to enhance learning in their online classroom. At the end of training, all hires receive an assigned a mentor teacher, and a content coach for the first six months of teaching for the company. Additionally, all teachers meet with their manager and regional colleagues on a monthly basis and have the opportunity to attend online professional development seminars during the school year. All full-time teachers are required to participate in a professional learning community on a yearly basis and contractors are encouraged to join one.

Ethical Considerations

The online service provider granted their permission to conduct this study (see Appendix D). Northwest Nazarene University's human research review board gave permission for this study in the spring of 2016 (see Appendix E). This study took into consideration and followed ethical standards in both its design and implementation. The researcher respected participants during the study and participants understood that taking part in the survey was optional. Participants had the right to leave the study at any time during the data collection process, and all

participants agreed to informed consent before accessing the survey. The researcher made participants aware of the purpose of the study and what would be required of them prior to beginning the study. No names or e-mails of participants were included in the study. All data collected were anonymous, will remain in a locked e-file, and all data collected will be destroyed after three years' time. Participants were given the choice to place their e-mail addresses into a drawing for two $50 Amazon gift cards upon the completion of their survey. Throughout the research, participants were given the right to exercise a power of choice (Drew, Hardman, & Hosp, 2008).

Data Collection

Data gathered from the participants for this study involved using a Likert-scale survey and open-ended questions. Two different types of Likert scales were part of the survey: one measuring frequency and the other measuring level of comfort. The survey focused on matching the objectives of the study to the research questions. A Qualtrics survey was e-mailed out to the participants. Participants had two weeks to complete the survey. One week prior to the survey deployment an informational e-mail was sent to participants to explain the purpose and structure of the study (see Appendix F). The researcher sent out the Qualtrics survey and subjects provided informed consent by electronically agreeing to complete the survey. Participants were unable to access the survey until they had agreed to informed consent. One week after the survey was distributed, the researcher sent out a reminder e-mail to all participants asking them to complete the survey. At the end of the two-week time, the survey was no longer accessible to participants. The researcher collected demographic information during the survey. Demographic data collected included information about educational background, years of teaching experience online and years of teaching experience in the brick-and-mortar classroom.

Analytical Methods

Descriptive statistical data analysis is the method of analyzing and processing data to draw conclusions and inferences based on the data, which answers the first research question. The researcher collected and analyzed data for this survey during the 2016–2017 school year. The researcher used frequency to identify which pedagogical practices were being used most often in the secondary online classroom. Research question two focused on the correlational analysis of the quantitative data to analyze this study, specifically using Spearman's rank order. The researcher performed correlation statistical tests to determine the strength and direction of the correlation between the best practices teachers used in the online classrooms and which best practices they carried over into their brick-and-mortar classrooms, which answers the second research question. A correlational analysis was used to look at the relationship between different pedagogical practices that were used online. The sample size for the study included 80 participants. This sample size was sufficient to validate a correlational study (Creswell, 2015). Data analysis took place with the use of SPSS software.

Trustworthiness of the Data

Several safeguards ensured the validity and trustworthiness of data. First, the survey was validated prior to being sent out. Second, all data collected remained confidential, were saved on a password-protected computer and analyzed using the SPSS software system.

Limitations

Several limitations are present in this study. First, a major limitation of the study was that data were only elicited from teachers who work for the publicly traded service provider. Second, the study assumed that those who responded to the survey did so in an honest and forthright manner.

Third, there are several school districts and charter schools around the nation that create and provide their own online learning courses; none of these types of online teachers participated in this study. The company requires teacher performance measures. These guidelines are in regards to how often a teacher must be in communication with their students, the frequency of synchronous sessions offered, and the requirement that all students receive feedback on teacher-graded assignments within 72 business hours. Furthermore, the study only surveyed teachers who teach on the PEAK, Online School, or Online High School learning management system. Accordingly, the results may not necessarily be generalized to teachers outside of secondary teachers employed by a large publicly traded service provider platform. A similar study could be conducted with online secondary teachers outside of the company.

Chapter IV

Results

Introduction

Online education continues to grow in the K–12 levels of education in the United States (Watson et al., 2014). Though research in online education at the college level is plentiful, research regarding online education in the K–12 grades remains scarce (Barbour, 2013; Barbour & Reeves, 2009). This study sought to address the gaps as noted in the literature. The purpose of this study was to identify the pedagogical practices secondary teachers use in their online classrooms and to identify if online teachers use these pedagogical practices in both their online classrooms and brick-and-mortar classrooms.

The following two research questions guided this study:

1. What pedagogical practices (i.e., synchronous instruction, asynchronous instruction, teacher feedback, teacher engagement) do online teachers use in their online classrooms?

2. Do online teachers use the same pedagogical practices and tools in both their online classrooms and brick and mortar classrooms?

In order to address the research questions, the researcher created a survey, validated it, and distributed the online survey to secondary teachers who taught in both online and brick-and-mortar classrooms. The research questions for this study were validated using a preliminary survey of teachers. The resulting reliability score was Cronbach's alpha of .785.

The findings from the descriptive statistical analyses are present in this chapter. Additionally, the chapter details the data collected and identifies correlations that the researcher found. This chapter contains four sections. The first section presents demographic information

about the participants. The second portion focused on research question 1. The third portion

focuses on research question 2 and presents a summary of the results from the correlational

analyses found within the data. The fourth portion discusses the data collected from the short

answer portion of the survey. This chapter also includes a discussion of the results within the

context of the research questions and the relationships between the use of pedagogical practices

in the online classroom and those same practices used in the brick-and-mortar classroom.

Chapter 4 concludes with a summary of the general research findings from the survey.

Quantitative methods and open-ended questions were used to triangulate this study and

better substantiate the findings from the data (see Table 2; Marshall & Rossman, 2016).

Table 2

Triangulation

Source 1 Close-Ended Survey Items	Source 2 Open-Ended Survey Items
Descriptive Statistics	Open Coding (Themes/Ideas)
Spearman Correlation	

Research Participants and Demographics

Secondary teachers employed by a large publicly traded service provider's Instructional

Service Team participated in the survey during September 2016. Two hundred and thirty

teachers were selected to receive the survey based on the likelihood that they taught in both the

online classroom and brick-and-mortar setting. Of the 230 surveys sent out, 130 participants

replied, and 80 of those participants fit the criteria of teaching in both settings. A filter was used

in the Qualtrics survey to automatically remove the responses of those who did not teach in both

classroom settings. The overall number of participants in this study was 80 ($N = 80$). The

response rate of participants is recorded in Table 3.

Table 3

Survey Response Rates by Participants

Responses by Participants	Total
Surveys Sent	230
Survey Responses	130
Surveys Excluded	50
Response Rate	35%

The demographic statistics gathered included gender of the participants, years teaching

in the online classroom, years teaching in the brick-and-mortar classroom, and when they earned

their teaching certificate. Participants in this study were 81% female ($n = 65$) and 19% male ($n =$

15) see Table 4.

Table 4

Gender of the Participants

Answer Options	%	N
Male	19	15
Female	81	65

The breakdown of how long participants taught in brick-and-mortar and online

classrooms appear in Figures 10 and 11. The majority of participants had taught in the online

classroom for 1–3 years, though the majority had taught in brick-and-mortar classrooms for 7–10 years (see Figures 10 and 11).

Figure 10

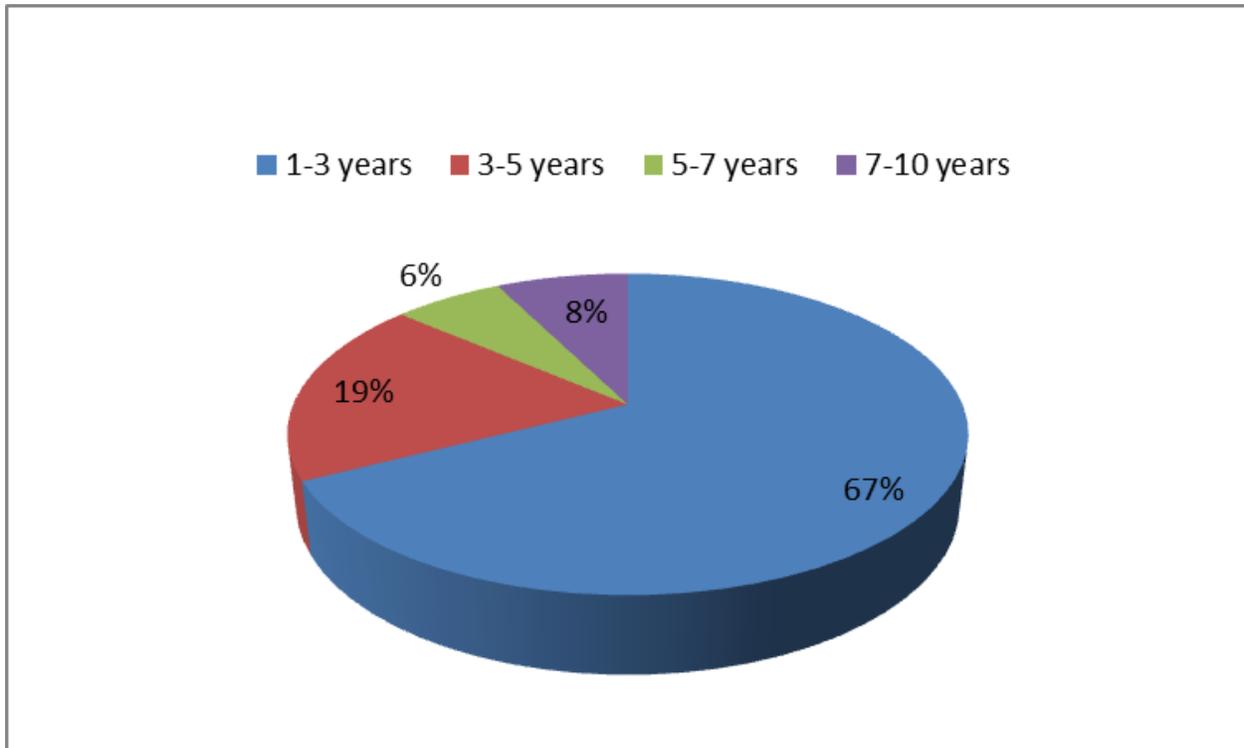*Length of Time Teaching in an Online Classroom*

Figure 11

Length of Time Teaching in a Brick-and-Mortar Classroom
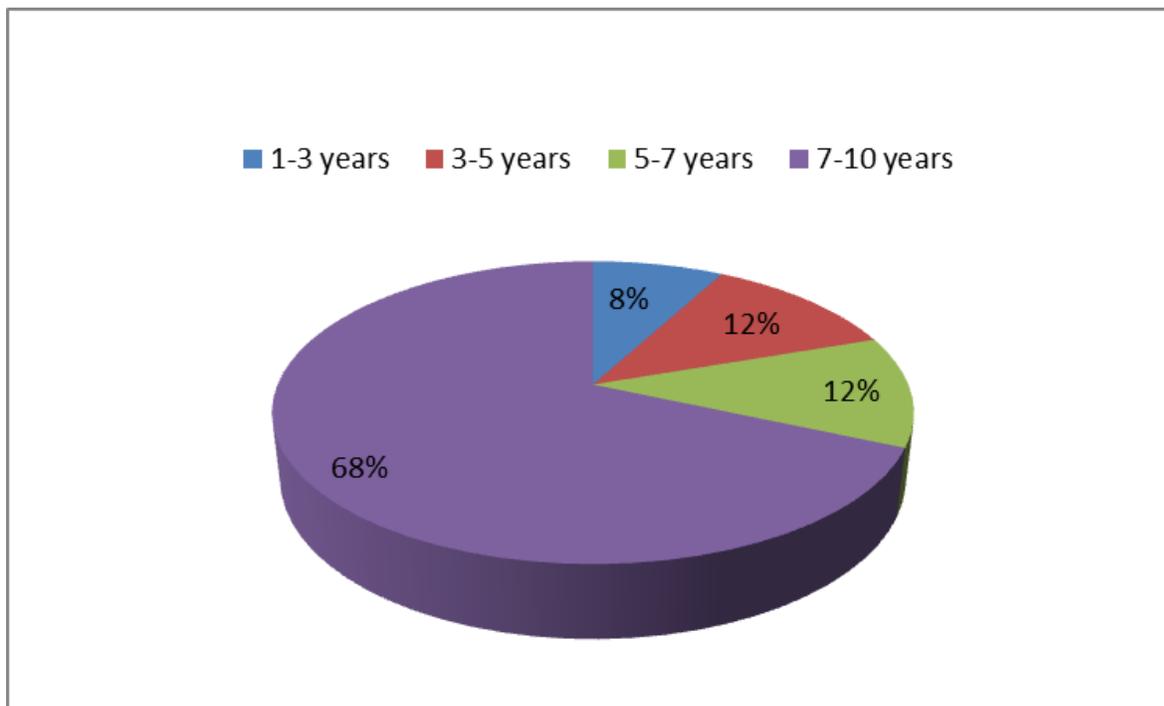
Table 5 displays how long ago the participants earned their teaching certificates. The length of time teachers had held certificates showed broad variance (M-19.5, range = 15, SD = 7.14).

Table 5

Length of Time Participant Has Held a Teaching Certificate

Answer Options	%	*N*
1–5 years	12.82%	10
6–10 years	32.05%	25
11–15 years	23.08%	18
16–20 years	32.05%	25

Research question 1: Pedagogical practices used online. The first research question sought to identify the pedagogical practices that secondary online teachers were using in their online classrooms. To answer research question 1, the researcher measured the frequency of each practice being used by collecting data on a 5-point Likert-scale, ranging from the rating of never to a great deal. Using the literature review in Chapter 2, the researcher identified common pedagogical practices used in online classrooms. Of the five practices included in this study, teacher feedback and threaded discussions were most commonly used in the online classroom. Data collection and descriptive statistics reported included frequency, mean, median, standard deviation, skewness, and kurtosis for each of the five pedagogical practices within the survey.

All data for research question 1 were collected using the following Likert-scale: 1—never, 2—rarely, 3—occasionally, 4—a moderate amount, and 5—a great deal (see Table 6).

Table 6

Descriptive Data for Survey Questions Pertaining to Research Question 1

Pedagogical Practice	*N*	Mean	Median	Standard Deviation	Skewness	Kurtosis
Synchronous Instruction	41	3.43	4.00	1.111	-.346	-.594
Asynchronous Instruction	53	3.85	4.00	1.032	-.682	-.041
Threaded Discussion	61	4.04	4.00	.892	-.842	.706
Online Collaboration	32	3.00	3.00	1.273	-.076	-1.078
Teacher Feedback on graded assignments within 24 hours	77	4.64	5.00	.601	-1.724	.995

Note: The combined mean formula of $(Nf \times Muf) + (Ns \times Mus)/Nf + Ns$ was used to determine mean score totals. The combined standard deviation formula =of $(Nf \times \sigma f) + (Ns \times \sigma s)/Nf + Ns$ was used to determine standard deviation score totals.

It is important to note that all five pedagogical practices were negatively skewed. Synchronous instruction ($z = -.346$) and online collaboration ($z = -.076$) were close to symmetrical. Asynchronous instruction (-.682) and threaded discussion (-.842) were moderately skewed. Teacher feedback had the largest negative skew of -1.724.

The data showed a negative kurtosis of synchronous instruction (-.594), asynchronous instruction (-.041), and online collaboration known as platykurtic distribution; theses tails are light as seen in Table 7. The data from threaded discussions (.706) and teacher feedback (.995) have a greater kurtosis with a distribution of heavier tails known as leptokurtic distribution (see Table 7).

Table 7

Pedagogical Practices Used in the Secondary Online Classroom

Pedagogical Practice	Frequency	Valid Percentage	N
Synchronous Instruction	Moderate Amount to Often	51.3%	41
Asynchronous Instruction	Moderate Amount to Often	66.3%	53
Threaded Discussion	Moderate Amount to Often	76.3%	61
Online Collaboration	Moderate Amount to Often	40%	32
Teacher Feedback on graded assignments within 24 hours	Moderate Amount to Often	96.3%	77

Teacher feedback on graded assignments was the most common pedagogical practice that secondary teachers identified as using at a 96.3% rate. The data showed that threaded discussions (76.3%) and asynchronous instruction (66.3%) were common practices in the online setting as well (see Figure 12).

Figure 12

Pedagogical Practices Used in Secondary Online Classrooms
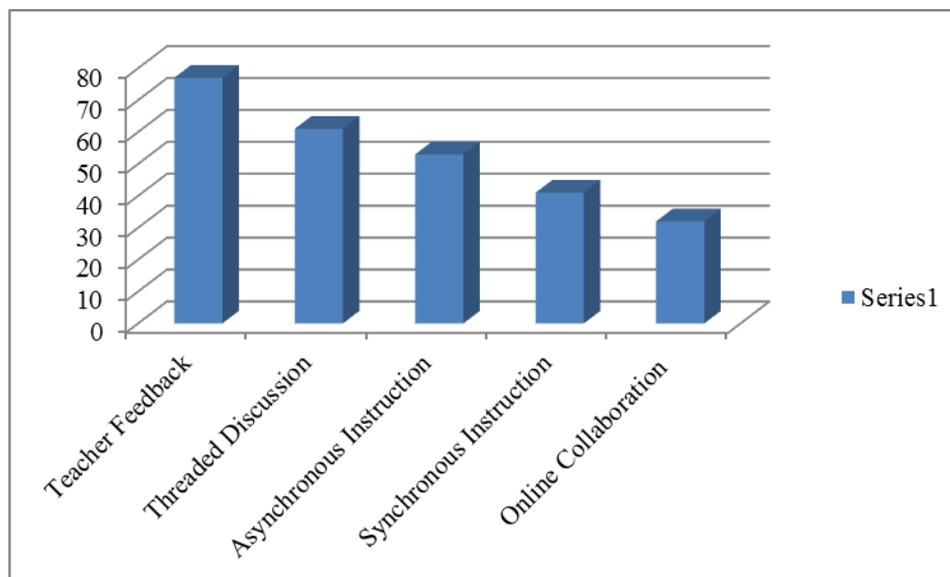
Research Question 2, Correlations Between Brick-and-Mortar and Online Classrooms

All data for research question 2 were collected using the following Likert-scale: 1—never, 2—rarely, 3—occasionally, 4—a moderate amount, and 5—a great deal. Table 8 lists the mean and standard deviation for each survey item.

Additionally, 11 out of 16 of the pedagogical practices were negatively skewed, ranging from -.072 to -1.403. There were negative outliers in the data, which were the most extreme and least characteristic data collected (Tanner, 2012).

Table 8

Descriptive Data for Research Question 2

Pedagogical Practice	*N*	Mean	Median	Standard Deviation	Skewness	Kurtosis
To what degree are you comfortable using technology in your online classroom?	80	4.55	5.0	.656	-.966	-1.68
To what degree do you use threaded discussions in your brick-and-mortar classroom?	80	2.43	2.0	1.240	.645	-.369
To what degree are you comfortable using technology in the brick-and-mortar classroom?	80	4.55	5.0	.614	-1.036	.074
To what degree do you use threaded discussions in your online classroom?	80	4.04	4.0	.892	-.842	.706
To what degree do you use asynchronous instruction (recorded lectures, social networking, collaborative documents) in your brick-and-mortar	80	2.7	3.0	1.205	.337	-.673
To what degree do you use asynchronous instruction (recorded lectures, social networking, collaborative documents) in your online classroom?	80	3.85	4.0	1.032	-.682	-.041
How often do you use synchronous tools (phone calls, Instant Messenger, Skype) with students in your brick-and-mortar classroom?	80	2.48	2.0	1.312	.504	-.833

How often do you use synchronous tools (phone calls, Instant Messenger, Skype) with students in your online classroom?	80	3.43	4.0	1.111	-.346	-.594
To what degree do you use online collaboration groups in your brick-and-mortar classroom?	80	2.6	2.5	1.228	.435	.532
To what degree do you use online collaboration groups in your online classroom?	80	3.0	3.0	1.273	-.076	-1.078
To what degree do you provide feedback within 24 hours on teacher-graded assignments in your brick-and-mortar classroom?	80	4.13	4.0	.919	-1.056	.532
To what degree do you provide feedback within 24 hours on teacher-graded assignments in your in your online classroom?	80	4.64	5.0	.601	-1.811	3.957
To what extent are you open to integrating new technology into your brick-and-mortar classroom?	80	4.25	5.0	.917	-.697	-.965
To what extent are you open to integrating new technology into your online classroom?	80	4.53	5.0	.763	-1.403	.864
Have your attitudes and beliefs toward technology impacted the use of technology in your brick-and-mortar classroom?	80	3.93	4.0	1.220	-.969	.532
Have your attitudes and beliefs toward technology impacted the use of technology in your online classroom?	80	3.89	4.0	1.201	-1.082	.532

The null and alternate hypotheses for research question 2 are below.

1. H_0: Online teachers who are comfortable using technology in their online classrooms often will be comfortable using technology in their brick-and-mortar classrooms as well. ..'

 H_1: Online teachers who are comfortable using technology in their online classrooms often will not be comfortable using technology in their brick-and-mortar classrooms as well.

2. H_0: Online teachers who use threaded discussions in their online classrooms often will use threaded discussions in their brick-and-mortar classrooms as well.

 H_1: Online teachers who use threaded discussions in their online classrooms often will not use threaded discussions in their brick-and-mortar classrooms as well.

3. H_0: Online teachers who use asynchronous instruction in their online classrooms often will use asynchronous instruction in their brick-and-mortar classrooms as well.

 H_1: Online teachers who use asynchronous instruction in their online classrooms often will not use asynchronous instruction in their brick-and-mortar classrooms as well.

4. H_0: Online teachers who use synchronous instruction in their online classrooms often will use synchronous instruction in their brick-and-mortar classrooms as well.

 H_1: Online teachers who use synchronous instruction in their online classrooms often will not use synchronous instruction in their brick-and-mortar classrooms as well.

5. H_0: Online teachers who use online collaboration groups in their online classrooms often will use online collaboration groups in their brick-and-mortar classrooms as well.

H_1: Online teachers who use online collaboration groups in their online classrooms often will not use online collaboration groups in their brick-and-mortar classrooms as well.

6. H_0: Online teachers who provide feedback on graded assignments within 24 hours in their online classrooms often will provide feedback on graded assignments within 24 hours in their brick-and-mortar classrooms as well.

H_1: Online teachers who provide feedback on graded assignments within 24 hours in their online classrooms often will not provide feedback on graded assignments within 24 hours in their brick-and-mortar classrooms as well.

The frequency of each online practice versus brick-and-mortar practice can be seen in figures 13–28.

Figures 13 and 14

Use of Technology, Brick-and-Mortar vs. Online
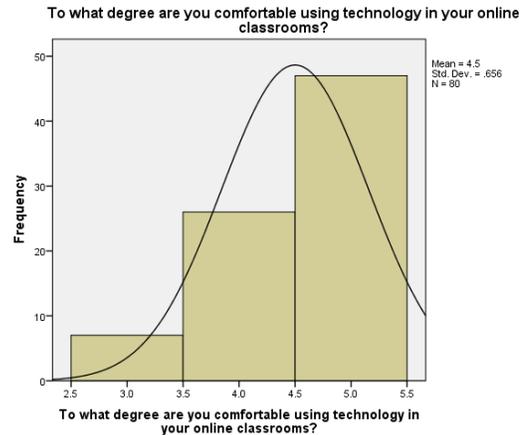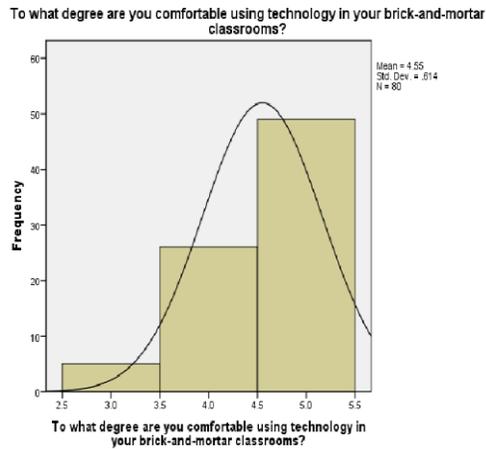
Figures 15 and 16

Use of Technology, Brick and Mortar vs. Online
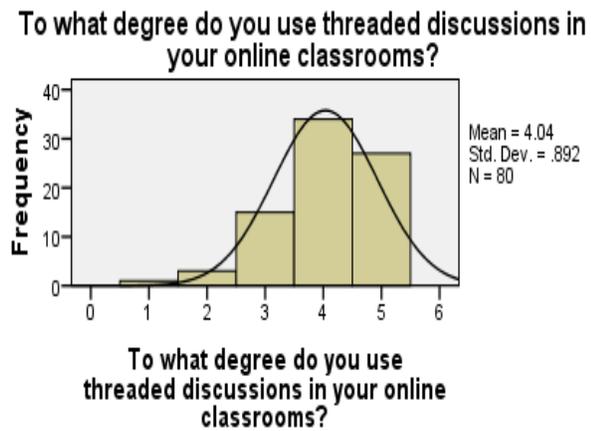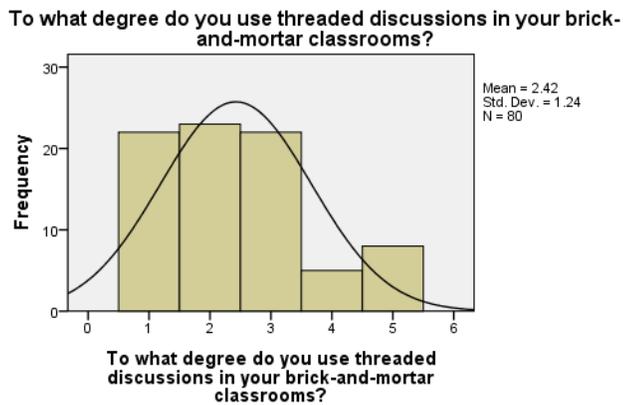
Figures 17 and 18

Asynchronous Instruction, Brick-and-Mortar vs. Online
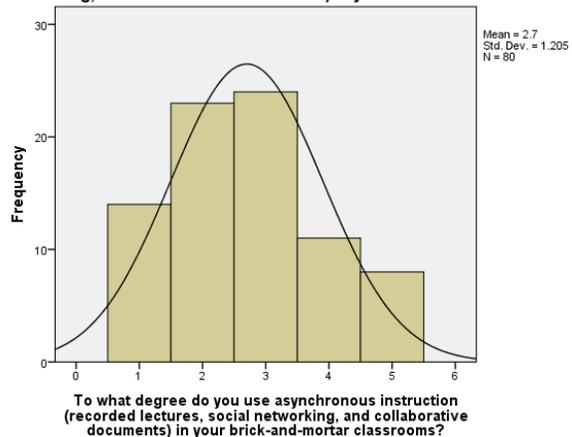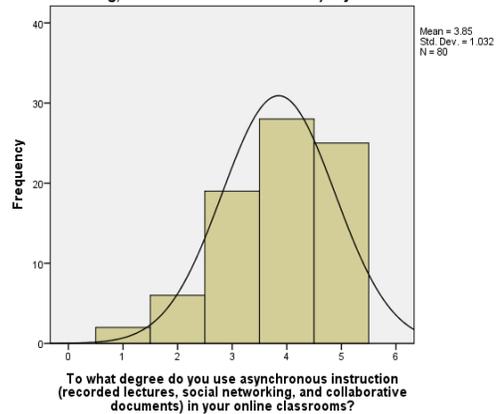
Figures 19 and 20

Synchronous Tools, Brick-and-Mortar vs. Online
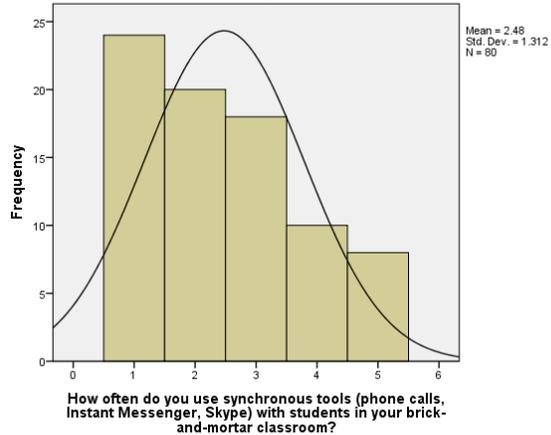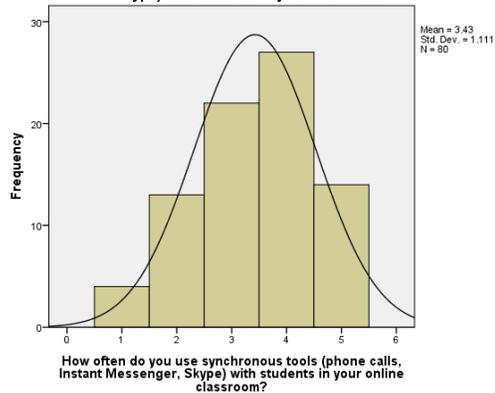
Figure 21 and 22

Online Collaboration, Brick-and-Mortar vs. Online
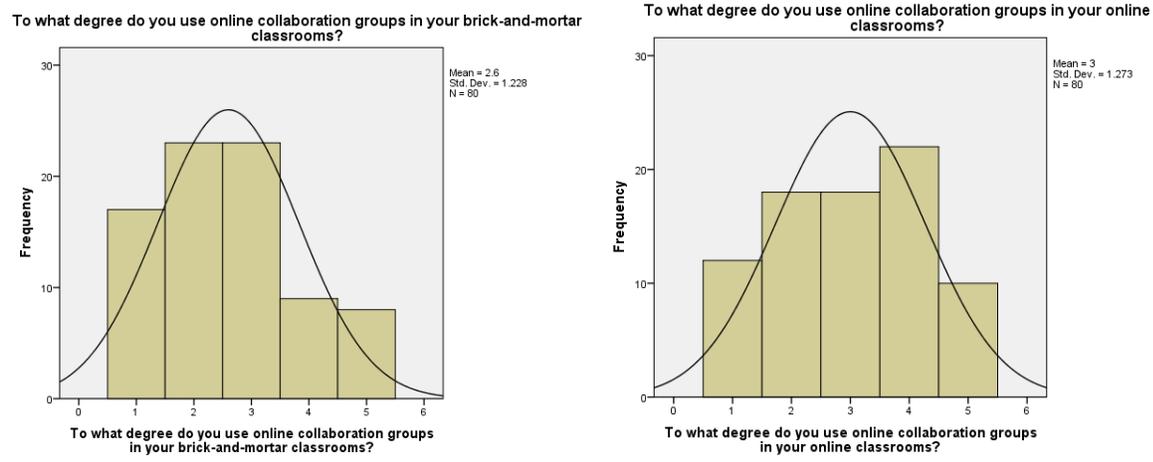
Figures 23 and 24

Teacher Feedback, Brick-and-Mortar vs. Online
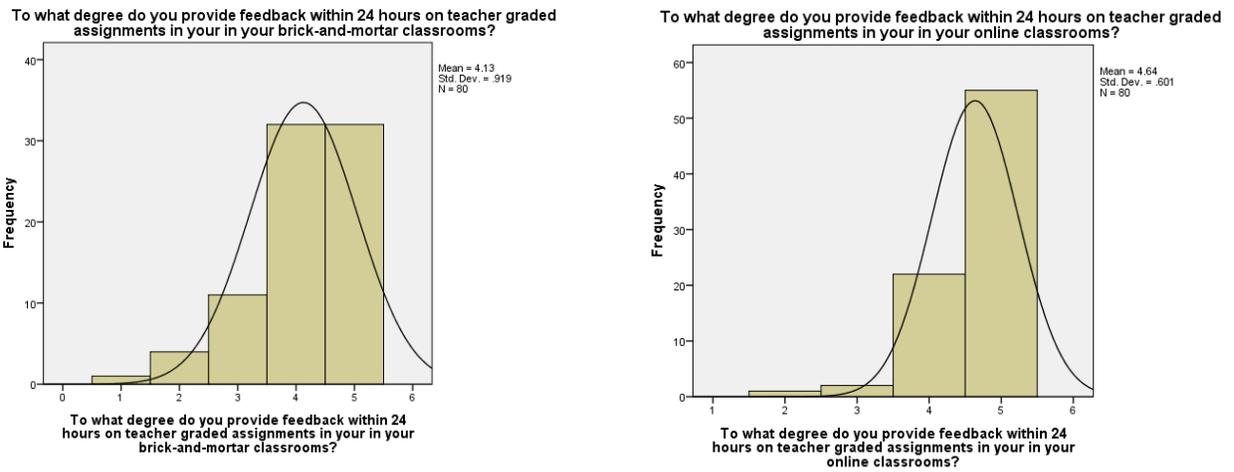
Figures 25 and 26

Integrating New Technology, Brick-and-Mortar vs. Online
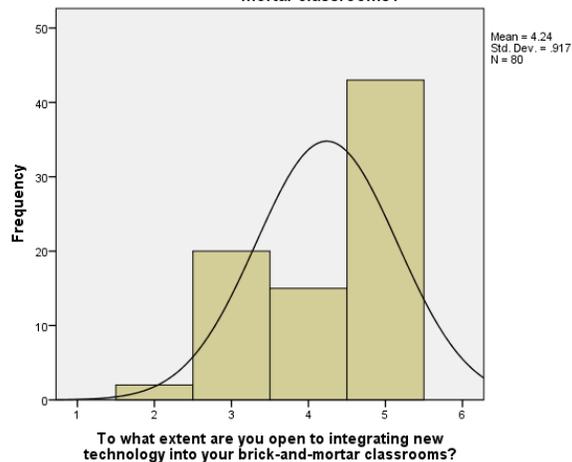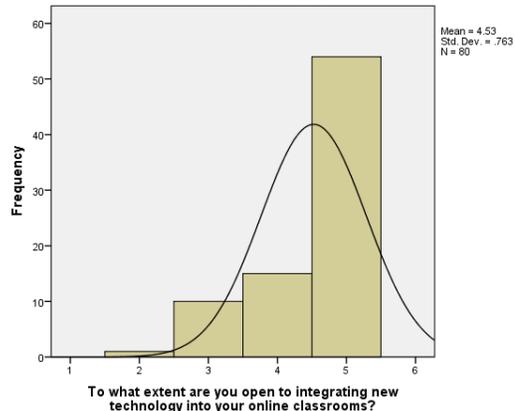
Figures 27 and 28

Attitudes and Beliefs Towards Technology, Brick-and-Mortar vs. Online
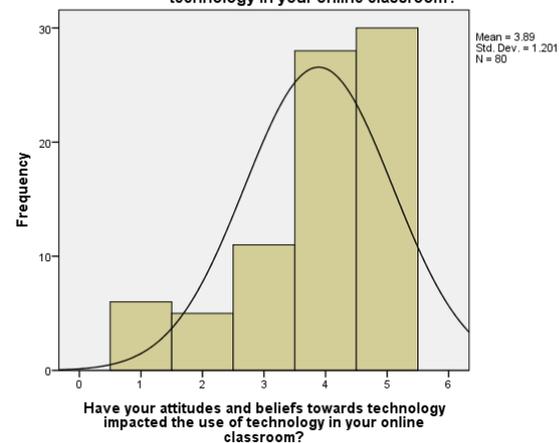
Correlation Analyses

Analyses of correlations were used to understand the relationship between the pedagogical tools teachers used in their brick-and-mortar classrooms and the pedagogical tools they used in their online classrooms. Correlation is a summary of the strength of the relationship

between two variables; it does not imply causation (Ary, Jacobs, Razavieh, & Sorenson, 2006). The statistical analyses presented in the following tables show the Spearman correlations for the following:

- Comfortable with the use of technology

- Threaded discussions

- Asynchronous tools

- Synchronous tools

- Online collaboration groups

- Teacher feedback

- Integrating new technology

- Attitudes and beliefs toward technology

The results suggested that 34 statistically significant correlations where identified as being significant ($a < .01$ or $a < .05$, two-tailed).

Likert-score responses compared how comfortable a participant was using technology in the online classroom as compared to the other survey items mentioned earlier. The results suggest that 12 statistically significant correlations existed in this category. A strong correlation was found between how comfortable participants were using technology in their online classroom and how comfortable they were using technology in a brick-and-mortar classroom, R (.534) with a significance of .000. Therefore, the null hypothesis is rejected at $\alpha < .05$, and the alternative hypothesis is accepted. One of the strongest correlations found was between how comfortable participants were using technology in their online classroom, as compared to the frequency they used asynchronous instruction in their brick-and-mortar classroom, R (.449) with a two-tailed significance of .000. Furthermore, a strong correlation was found between how

comfortable participants were using technology in their online classroom and the attitude toward

the use of technology in their brick-and-mortar classroom, *R* (.226) with a significance of .003

(see Table 9).

Table 9

Survey Question: To What Degree Are You Comfortable Using Technology in Your Online

Classroom?

Correlated Survey Items	*N* Value	*R* Value	Significance (two-tailed)
Comfortable using technology in the online classroom as compared to how comfortable they were using technology in the brick-and-mortar classroom	80	.534**	.000
Comfortable using technology in the online classroom as compared to using asynchronous instruction in the brick-and-mortar classroom	80	.449**	.000
Comfortable using technology in the online classroom as compared to how attitudes and beliefs impacted technology use in the online classroom	80	.436**	.000
Comfortable using technology in the online classroom as compared to integration of technology in the online classroom	80	.400*	.000
Comfortable using technology in the online classroom as compared to the use of online collaboration groups in the online classroom	80	.373**	.001
Comfortable using technology in the online classroom as compared to attitudes toward the use of technology in the brick-and-mortar classroom	80	.326**	.003
Comfortable using technology in the online classroom as compared to the frequency of synchronous tools used in brick-and-mortar classrooms	80	.320**	.004

Comfortable using technology in the online classroom as compared to the frequency of asynchronous instruction in the online classroom	80	.319**	.004
Comfortable using technology in the online classroom as compared to frequency of integrating technology into the brick-and-mortar classroom	80	.318**	.004
Comfortable using technology in the online classroom as compared to the use of threaded discussions in the online classroom	80	.280*	.012
Comfortable using technology in the online classroom as compared to the frequency of synchronous tools in the online classroom	80	.267*	.017
Comfortable using technology in the online classroom as compared the use of threaded discussion in the brick-and-mortar classroom	80	.257*	.022
Comfortable using technology in the online classroom as compared to the use of online collaboration groups in the brick and mortar classroom	80	.234*	.036

*. Correlation is significant at the 0.05 level (two-tailed).
**. Correlation is significant at the 0.01 level (two-tailed).

Correlations were calculated between the degrees that threaded discussions were used in the online classroom as compared to the other pedagogical practices. A strong correlation was identified between the use of threaded discussions in the online classroom and the use of threaded discussions in the brick-and-mortar classroom: $R(.335)$ and significance of .002. Therefore, the null hypothesis at $\alpha < .05$ is rejected, and the alternative hypothesis is accepted. Another significant correlation was identified between the use of threaded discussions in the online classroom and the use of online collaboration groups in the brick-and-mortar classroom: R (.273) with a significance of .014 (see Table 10).

Table 10

Survey Question: To What Degree Do You Use Threaded Discussions in Your Online

Classroom?

Correlated Survey Items	*N*	*R*	Significance (two-tailed)
Degree threaded discussions were used in the online classroom as compared to frequency of asynchronous instruction in online classrooms	80	.489**	.000
Degree threaded discussions were used in the online classroom as compared to integrating new technology into the online classroom	80	.383**	.293
Degree threaded discussions were used in the online classroom as compared to the use of threaded discussions in the brick-and-mortar classroom	80	.335**	.002
Degree threaded discussions were used in the online classroom as compared to how attitudes and beliefs impacted technology use in the online classroom	80	.293*	.008
Degree threaded discussions were used in the online classroom as compared to how comfortable participant was using technology in the online classroom	80	.280*	.012
Degree threaded discussions were used in the online classroom as compared to the use of online collaboration groups in the brick-and-mortar classroom	80	.273*	.014

*. Correlation is significant at the 0.05 level (two-tailed).
**. Correlation is significant at the 0.01 level (two-tailed).

The degree asynchronous instruction was used in the online classroom was correlated

with the survey items, and seven significant correlations were identified. A strong correlation

was identified between the degree asynchronous instruction was used in the online classroom

and the degree synchronous instruction was used in the brick-and-mortar classroom: R (.352) with a significance of .001. Furthermore, statistical evidence showed a correlation between the degree teachers used asynchronous instruction in the online classroom and the degree they use asynchronous instruction in the brick-and-mortar classroom. Therefore, the null hypothesis at α < .05 is rejected, and the alternative hypothesis is accepted (see Table 11).

Table 11

Survey Question: To What Degree Do You Use Asynchronous Instruction in Your Online

Classroom?

Correlated Survey Items	N	R	Significance (two-tailed)
Degree asynchronous instruction was used in the online classroom as compared to the degree synchronous instruction was used in the online classroom	80	.473**	.000
Degree asynchronous instruction was used in the online classroom as compared to integrating new technology into the online classroom	80	.379**	.001
Degree asynchronous instruction was used in the online classroom as compared to the degree synchronous instruction was used in the brick-and-mortar classroom	80	.352**	.001
Degree asynchronous instruction was used in the online classroom as compared to how attitudes and belief impacted the use of technology in the online classroom	80	.326**	.003
Degree asynchronous instruction was used in the online classroom as compared to the use of asynchronous instruction in the brick-and-mortar classroom	80	.311**	.005
Degree asynchronous instruction was used in the online classroom as compared to the use of online collaboration groups in the online classroom	80	.268*	.016
Degree asynchronous instruction was used in the online classroom as compared to integrating new technology into the brick-and-mortar classroom	80	.237*	.034

*. Correlation is significant at the 0.05 level (two-tailed).
**. Correlation is significant at the 0.01 level (two-tailed).

The degree with which synchronous instruction was used in the online classroom was

correlated with the survey items, and four significant correlations were identified. The strongest

correlation in this category was between the degree synchronous instruction was used in the online classroom as compared to the degree it was used in the brick-and-mortar classroom: R (.574) with a significance of .000. Therefore, the null hypothesis at $\alpha < .05$ is rejected, and the alternative hypothesis is accepted (see Table 12).

Table 12

Survey Question: How Often Do You Use Synchronous Tools With Students in Your Online Classroom?

Correlated Survey Items	N	R	Significance (two-tailed)
Degree synchronous instruction was used in the online classroom as compared to the degree synchronous instruction was used in the brick-and-mortar classroom	80	.574**	.000
Degree synchronous instruction was used in the online classroom as compared to the degree online collaboration groups were used in the online classroom	80	.437**	.000
Degree synchronous instruction was used in the online as classroom compared to integrating new technology into the online classroom	80	.235*	.036
Degree synchronous instruction was used in the online classroom as compared to how attitudes and beliefs impacted technology use in the online classroom	80	.270*	.015
*. Correlation is significant at the 0.05 level (two-tailed). **. Correlation is significant at the 0.01 level (two-tailed).			

Several other correlations were identified to be significant from the data. A strong correlation between the degree teacher feedback was provided in the online classroom within 24 hours and the degree teacher feedback was given in the brick-and-mortar classroom within 24 hours was found: R (.534) with a significance of .000. Therefore, the null hypothesis at $p < .05$ is

rejected, and the alternative hypothesis is accepted. Furthermore, a correlation was found between the degree online collaborations groups were used in the online classroom and the degree they were used in the brick-and-mortar classroom: R (.236) with a significance of .035. Therefore, the null hypothesis at $p < .05$ is rejected, and the alternative hypothesis is accepted. The strongest correlation from the data was found between participants' attitudes and beliefs toward technology in the online classroom and their attitudes and beliefs toward technology in the brick-and-mortar classroom: R (845) with a significance of .000 (see Table 13).

Table 13

Correlated Survey Questions

Correlated Survey Items	N	R	Significance (two-tailed)
Degree online collaboration was used in the online classroom as compared to the degree online collaborations were used in the brick-and-mortar classroom	80	.236*	.035
Degree online collaboration was used in the online classroom as compared to integrating new technology in the online classroom	80	.325**	.003
Degree teacher feedback was provided within 24 hours in the online classroom as compared to the degree teacher feedback was given within 24 hours in the brick-and-mortar classroom	80	.534**	.000
Degree of integrating new technology into the online classroom as compared to how attitudes and belief impacted the use of technology in the online classroom	80	.300**	.007
Degree of integrating new technology into the online classroom as compared to how attitudes and belief affected the use of technology in the brick-and-mortar classroom	80	.239*	.033
Attitudes and belief towards technology in the online classroom as compared to the attitudes and beliefs toward technology in the brick-and-mortar classroom	80	.845**	.000

*. Correlation is significant at the 0.05 level (two-tailed).
**. Correlation is significant at the 0.01 level (two-tailed).

While a number of significant correlations were identified from the data, the effect size must be taken into consideration. A wide range of effect sizes were present within the data from a strong effect size of .845 to a small or medium effect size of .245.

Open-Ended Questions

The survey ended with three open-ended questions. Participants had the option to leave the field blank or enter responses. The researcher reviewed the short answers and coded the data to find general patterns and themes. The first question was, "How have your attitudes and beliefs toward technology impacted the use of technology in your brick-and-mortar classrooms and online classrooms?" Of the 80 respondents, 58 answered this question. Four themes emerged from the data: Table 14 contains examples of the short answer responses to this question. 1) attitudes and beliefs surrounding technology had positively affected the way participants used it in both their brick-and-mortar and online classrooms, 2) had negatively impacted their use of technology, 3) attitudes and beliefs did not affect their use of technology at all, and 4) attitudes and beliefs had both positive and negative impacts.

Table 14

Short Answer Examples for Question 16

Theme	Frequency	Examples
It has led to more technology use in the brick-and-mortar classroom.	44	"I try to learn something new and apply it every day. I have learned a great deal about technology and tried creative ways to incorporate it in the classroom." "I have added a great deal of technology to all my rick-and-mortar classes."
It has led to less technology use in the brick-and-mortar classroom.	5	"I am fairly uncomfortable with technology, and so sometimes I avoid it." "In math, students should not be using calculators for basic math calculations. They need to be able to do these without; I want my students using less technology."
It has not changed my practices at all.	8	"They have remained the same." "They have not."
There have been both positive and negative amounts of technology added to the brick-and-mortar classroom.	1	"In brick-and-mortar, it depends on the use. If I'm teaching programming, I want students to use whatever tools are available to them, but I don't want them to use too much technology."

When asked to describe, "How do you monitor and observe students' academic progress in your online classroom," 70 out of the 80 participants responded to the question. The main themes that emerged were student log-in times, grade books, communication (e-mails, instant messenger, etc.), tests and quizzes, and a combination of the tools listed in Chapter 2. Responses to this open-ended question were widely varied and were used to provide additional insight into the inferential findings. Examples of the short answer responses to this question are in Table 15.

Table 15

Short Answer Examples for Survey Question 14

Themes	Frequency	Examples
Student log-in times	11	"Log time and work completed." "I check on their activity level daily. My classes are setup to where I can see the dates they have logged in to class."
Grade book	22	"Constantly leaving comments on assignments, looking at their grades and what they have completed and what they are working on. Open communication!" "Online grade book."
Communication (e-mails, phone calls, etc.)	4	"Communication with the student is an important piece of this. Intrusive advising also helps." "E-mails."
Test and quiz results	4	"Grading their work and giving feedback; I am aware of their progress." "Quizzes, test, verbal questions."
Combination of tools listed earlier	27	"Through e-mails, grading information, discussion boards and metrics." "Daily. Spreadsheets. Grade book. E-mails. Contact. Weekly check-ins."
Question did not apply	2	

When asked to describe "How has your experience with the use of technology in your online classroom impacted the use of technology in your brick-and-mortar classroom?," 65 participants chose to answer the open-ended question. From the data, five themes emerged: (1) a small amount, (2) some, (3) a lot, (4) none, and (5) it had made them more comfortable with the use of technology. Examples of the short answer responses to this question are in Table 16.

Table 16

Short Answer Examples for Survey Question 18

Theme	Frequency	Examples
A small amount	4	"Very little." "Not much."
Some	7	"I tend to use more technology online but have integrated more of it in my brick-and-mortar classrooms." "I have been using Google Classroom to provide feedback to my brick-and-mortar students."
A lot	30	"It has allowed me to integrate technology even more in my brick-and-mortar classroom." "I've changed the way I teach a great deal. I use technology on almost a daily basis in my brick-and-mortar classroom."
None	13	"It hasn't." "It has not impacted it at all."
More comfortable	10	"It has helped me feel comfortable using it." "I am more comfortable with the use of technology as I use it in the online classroom."

Conclusion

Chapter 4 provided an analysis for data collected from an online survey. This study used a quantitative approach to identify the frequency of pedagogical practices used in the secondary online classroom and to identify correlations between these practices. Quantitative data were used for descriptive statistics along with the Spearman correlation test to identify correlations between online classrooms and brick-and-mortar classrooms. Short answer data were

summarized using an open-coding method, which was based on determining the frequency of

responses from open-ended survey questions.

Chapter V

Discussion

Introduction and Summary of Results

Over the past decade, online education has drastically changed schooling in the United States and around the world (Archambault & Crippen, 2009; Mbuva, 2014; Watson et al., 2014). Today, many online teachers teach in both the online setting and brick-and-mortar setting simultaneously (Dessoff, 2009). This study enhanced the body of knowledge in online learning at the secondary education level. Barbour (2013) found that previous research in the K–12 online learning setting was scant and lacking a variety of methodological approaches. Specifically, this study highlighted practices that were being used by secondary online teachers in both their online classrooms and brick-and-mortar classrooms. Research question 1 focused on the frequency that pedagogical practices were being used in the online classroom. Research question 2 focused on quantitative correlational research used to investigate online tools used in both settings. Chapter 1 introduced the problem, background of online education, and research questions. The literature review, summarized in Chapter 2, identified what pedagogical practices were being used by online teachers at the collegiate level and established a theoretical framework for the transactional distance theory (Moore, 1993; Shearer, 2009). Chapter 3 described the methods that would be used to create, validate, and send out an online survey. Chapter 4 illustrated the analyses and evaluation of data based upon frequency and correlations. The purpose of this chapter is to provide a discussion of the results from this study. This chapter is organized to discuss the findings of research questions 1 and 2, implications of the results, practical implications, and recommendations for future research.

Methodology Review

A quantitative approach was used for this study to add greater depth to the body of research in online education. For this study, an online survey was created and distributed to secondary-level teachers who taught in both the online setting and brick-and-mortar settings. The survey was made up of 24 items. The first four questions were in regards to demographics, the next 16 were Likert-scale questions, and the final three were open-ended questions to add more depth to the survey (Cresswell, 2015). Two hundred thirty surveys were distributed to the teachers; of those, 130 participants replied, and 80 met the criteria of teaching in both the online and brick-and-mortar setting, for a response rate of 34%.

Results and Implications for Research Question 1

The first research question focused on what pedagogical practices teachers were using in their online classrooms. These pedagogical practices had been identified in Chapter 2: synchronous instruction, asynchronous instruction, online collaboration groups, teacher feedback and communication, and overall attitude toward technology (Crews & Neill, 2014; Lee et al., 2004). All participants completed the same online survey through Qualtrics.

Because there were several studies that identified which pedagogical practices were being used at the postsecondary level (Barbour, 2008; Casey & Kroth, 2013; Ni & Aust, 2008; Skinner & Peters, 2012; Yu-Chun et al., 2014), the researcher expected that many of these same practices were being used at the secondary level. Frequency statistics revealed the teacher feedback, threaded discussions, and asynchronous instruction were the pedagogical practices used most often. All of the practices were used, with their prevalence ranging from 40% to 96%. Based on this research and data from this study, there are two main implications that can be drawn. First, this body of research can be used to build and establish effective practices for training online

secondary teachers. As a school or district is preparing to train teachers in the online classroom, this research affirms tools that are commonly used in college and secondary-level online classrooms (Archambault & Crippen, 2009; Malinovski et al., 2014), and, therefore, the results can guide possible training needs. Second, these pedagogical practices should be developed and enhanced in current online teacher programs and training. This conclusion is consistent with several studies that point to the use of synchronous instruction, asynchronous instruction, online collaboration groups, and teacher feedback in postsecondary classrooms (Malinovski et al., 2014; McCarthy et al., 2010; Skramstad et al., 2012; Strang, 2012).

Results and Implications for Research Question 2

In order to investigate the correlation between pedagogical practices used in the online classroom and those in the brick-and-mortar classroom, a Spearman correlation was performed to identify positive or negative relationships between the variables. The researcher inferred the higher frequency of use in the online classroom would have a positive correlation on the frequency of use in the brick-and-mortar classroom. Using the quantitative, comparative statistical model, these six null hypotheses were tested:

1. H_0: Online teachers who are comfortable using technology in their online classrooms often will be comfortable using technology in their brick-and-mortar classrooms.

2. H_0: Online teachers who use threaded discussions in their online classrooms often will use threaded discussions in their brick-and-mortar classrooms.

3. H_0: Online teachers who use asynchronous instruction in their online classrooms often will use asynchronous instruction in their brick-and-mortar classrooms.

4. H_0: Online teachers who use synchronous instruction in their online classrooms often will use synchronous instruction in their brick-and-mortar classrooms.

5. *H*₀: Online teachers who use online collaboration groups in their online classrooms often will use online collaboration groups in their brick-and-mortar classrooms.

6. *H*₀: Online teachers who provide feedback on graded assignments within 24 hours in their online classrooms often will provide feedback on graded assignments within 24 hours in their brick-and-mortar classrooms.

All the null hypothesis failed to be rejected. The findings from this study supported all of the null hypotheses, which stated that when teachers use a pedagogical practice online, they are likely to use the same practice in their brick-and-mortar classrooms. Several significant correlations were found between the pedagogical practices used in the online classroom and the same pedagogical practices used in the brick-and-mortar classroom. It is important to note that the correlations found in this study did not imply the causation for this study.

Several strong correlations were found between how comfortable participants felt using technology in their online classrooms and the frequency of many different pedagogical practices used in their brick-and-mortar classrooms, such as the correlation between how comfortable participants were using technology in their online classrooms and the following: how comfortable they felt using technology in the brick-and-mortar classroom (.534, significance of .000), asynchronous instruction in the brick-and-mortar classroom (.449, significance of .000), attitudes and beliefs toward technology in the brick-and-mortar classroom (.326), frequency of synchronous tools in the brick-and-mortar classroom (.320, significance of .004), frequency of integrating new technology into the brick-and-mortar classroom (.318, significance of .004), and the use of threaded discussions in the brick-and-mortar classroom (.257, significance of .022) (see Table 9). These findings support the study by Rana (2012) that found teacher's beliefs and attitudes toward technology were based on their own experience and interaction with technology,

implying the more the exposure and experience a teacher has with technology, the more likely

the teacher will be to use it in other contexts (Ertmer et al., 2012; Martin & Shulman; 2006).

Significant correlations were also identified between each online variable and its brick-

and-mortar counterpart. A correlation of .311 (significance of .005) was found between the use

of asynchronous instruction in both environments (see Table 11), which supports previous

research around the importance and use of asynchronous instruction (Crews & Neill, 2014;

Karsenti & Collin, 2011). A correlation of .574 (significance of .000) was found in the use of

synchronous instruction in both settings (see Table 12) and supports research on the use of

synchronous instruction (Crews & Neill, 2014; Watters & Robertson, 2009; Zhang & Zhou,

2003). Similarly, a correlation of .236 (significance of .035) was found between the use of online

collaboration groups in both environments, as well as correlations between teacher feedback in

both environments (.534 significance of .000), and the integration of new technology in both

classroom settings (.239; see Table 13, Flanagan & Shoffner, 2013; Rana, 2012). Ertmer et al.

(2012) found that teachers own belief and attitudes surrounding technology influenced how they

chose to use technology in the classroom. This study supports the findings from the strongest

correlation found in this study, which was between the attitude and beliefs toward technology

participants had in their online classrooms and the attitudes and beliefs they had toward

technology in their brick-and-mortar classrooms (.845, significance of .000) see Table 13.

Other strong correlations were also identified during the study, such as significant

correlations between different pedagogical practices used in the online classroom. For example,

the data showed a significant correlation between the degree threaded discussions were used and

asynchronous instruction (.489; see Table 10). Data also revealed strong correlations between

asynchronous instruction and synchronous instruction online (. 311; see Table 11), synchronous

instruction and online collaboration groups (.437; see Table 11), asynchronous instruction and integrating new technology in the online classroom (. 379; see Table 11), and the use of threaded discussions and a willingness to integrate new technology in the online classroom (. 383; see Table 10). It is important to note that Corder and Foreman (2009) established that a relationship can be strong and yet not significant. Equally, a relationship can be weak but significant. When using small sample sizes, a strong correlation may appear due to chance, and the researcher must take into consideration the significance before jumping to reaching conclusions. Similarly, when working with large samples, it is easy to achieve significance, and the researcher must look at the strength of the correlation to identify a relationship that might exist.

Emergent Themes

Three open-ended questions were asked at the end of the survey. An open-ended coded method was used to identify emerging themes from the short answers (Creswell, 2015). The frequency of themes for each survey question was calculated and mentioned in Chapter 4. This portion of Chapter 5 explains the significance of each of the main themes found.

When asked, "How have your attitudes and beliefs toward technology impacted the use of technology in your brick-and-mortar classrooms and online classrooms?" 44 out of 58 responded that they have led them to use more technology in their brick-and-mortar classrooms. This supports prior research that teachers' attitudes and beliefs in technology impact how they use technology (Bang & Luft, 2013; Ersoy & Bozkurt, 2015; Ertmer et al., 2012). Furthermore, this theme supports the study by Rana (2012) that found teachers' beliefs and attitudes toward technology were based on their own experience and interaction with technology, implying the more the exposure and experience teachers have working with technology, the more likely they will use it in other contexts (Martin & Shulman, 2006).

The second open-ended research question asked, "How do you monitor and observe students' academic progress in your online classroom?" Twenty-seven out of 70 participants responded with the theme of using a combination of online tools, including student log-in times, tests and quiz grades, different forms of student communication, and grade books. These results support prior research that discusses the importance of engaging students in the online classroom in many different ways (Crews & Neill, 2014; Hodges & Cowan, 2012; Karsenti & Collin, 2011). This also provides support for the findings of research question 1 and builds on previous studies that identified what pedagogical tools online teachers were using in their classroom.

The third open-ended question asked, "How has your experience with the use of technology in your online classroom impacted the use of technology in your brick-and-mortar classroom?" Sixty-five participants chose to answer this survey question. The main theme was the idea that technology use in the online classroom has greatly impacted their use of technology in the brick-and-mortar classroom. Prior research identifies the concerns teachers have when being introduced to an online classroom (Griffin, 2014; Macy, 2006; Rana, 2012). Very little research up until this point has focused on the benefits to teachers who teach in both learning environments. Findings from this theme are supported by studies that identify the two main reasons teachers are resistant to technology in the classroom are their own lack of experience and training with technology, and their attitudes and beliefs toward technology (Bang & Luft, 2013; Ersoy & Bozkurt, 2015; Ertmer et al., 2012). The researcher infers based on the data that the more teachers are exposed to and trained in educational technology, the more likely they are to implement it in their traditional classroom. Judson's (2006) research shows a connection between teachers who view technology as valuable in the classroom and the likelihood of them using it in their classrooms.

Implications for Professional Practice

Based on the findings from this study, several recommendations from the researcher can be given to educators. These recommendations are also based on much research that has been done in the past (Barbour, 2008; Casey & Kroth, 2013; Ni & Aust, 2008; Skinner & Peters, 2012; Yu-Chun et al., 2014). Much of this study speaks to what is being used by teachers in online classrooms around the United States today. Practically, this study could influence how online schools and districts train new online teachers and what type of professional development they offer. This study could also be used to offer suggestions for different types of online tools that could be used in the brick-and-mortar setting and used to create a survey to assess what type of online teaching tools with which brick-and-mortar teachers are already familiar. Furthermore, this study speaks to the importance of providing educators with opportunities to try new technological tools and skills, in order to provide more experience and ease for teachers, in order to encourage the use of new technology in the classroom.

Recommendations for Future Research

Online education continues to grow in various forms (Archambault, Kennedy, & Bender, 2013; Watson et al., 2014). Today many instructors teach in both the online and brick-and-mortar settings (Dessoff, 2009). It is apparent that many of the same tools that are used in postsecondary online classrooms are also used in secondary online classrooms (Archambault & Crippen, 2009; Malinovski et al., 2014). This study identified several of these pedagogical practices. One suggestion for further study would be to replicate the study and gather more data from the qualitative perspective. Additional studies may focus on the use of the pedagogical practices in the K–8 online classrooms. Such as online pedagogical practices used in the K–8 grades and how these pedagogical practices change when used with younger students.

Additionally, research could also focus on what pedagogical practices are used in blended classrooms and how these practices are used in the blended environment. Furthermore, additional research should be done with a wide range of teachers from different online schools throughout the United States.

Further research should build off of the correlations found in this study between online classrooms and brick-and-mortar classrooms. Future studies should include identifying the same type of correlations in a wide range of online versus brick-and-mortar settings, focusing specifically on the cause of the correlations and strength of the correlations. More research could also be done at the qualitative level to provide a deeper understanding of the relationship identified between different types of online learning tools. Additionally, future research should focus on how different types of online training can prepare new teachers for teaching online and how training affects their performance in the online world and influences any correlations in the brick-and-mortar classrooms. Other research could focus on how brick-and-mortar pedagogical practices influence online teaching pedagogical practices. Finally, further research could be conducted on other types of pedagogical practices and technology used in online classrooms and any correlations that could be identified between their online use and use in the brick-and-mortar classroom.

Conclusion

Included in Chapter 5 were discussions of the findings and significance of this study. This current study attempted to understand what pedagogical practices were used in secondary online classrooms. Descriptive statistics and Spearman correlation tools were used to identify the pedagogical practices being used and the relationships between online practices and brick-and-mortar classrooms. The frequency data was consistent with previous research indicating the

types of pedagogical practices used online: synchronous instruction, asynchronous instruction, teacher feedback, online collaboration groups, and threaded discussions. The results led to accepting the null hypotheses H_0 and recognizing strong correlations between pedagogical practices in the online classroom and pedagogical practices in the brick-and-mortar classroom.

The findings from this study demonstrate the need for more studies of online teaching practices at the secondary level, and the need for more professional development for online and brick-and-mortar teachers regarding technological tools that can be used in the classroom. School districts and online school providers need to offer training and professional development that provide teachers with more exposure and practice to educational online tools. Researchers can employ the results from this current study in future research of online schooling practices. This current study is significant because it begins to identify the correlations that exist between both classroom settings.

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Appendix A

Permission to Use Tables

Inbox

Jessi Sigander <jsigander@nnu.edu>

9:51 AM (14 minutes ago)

Hello,

My name is Jessi Sigander and I am a doctoral student at Northwest Nazarene University in Nampa, Idaho. I am working on my dissertation titled: Best practices in K-12 Online Teaching: A Quantitative Study Exploring Secondary Classrooms Online and Brick-and-Mortar Classrooms. My committee is chaired by Dr. Bill Fritz. I am requesting permission to use the following tables listed below in my dissertation. Please let me know if you have any questions or if there is someone else I should contact in regards to this matter.

Thank you!

Jessi Sigander

503 442 8599

1. Notable Operators Currently Providing Courses for the Nation from Keeping Pace with K–12 Digital Learning, by Watson, Pape, Murin, Gemin, and Vashaw (2014).

2. Digital Options in Online Schooling from Keeping Pace with K–12 Digital Learning, by Gemin et al. (2014).

3.States with Statewide Fully Online Schools from Keeping Pace with K–12 Digital Learning, by Watson et al. (2014). Retrieved from http://www.kpk12.com/reports/ Currently seeking permission to use this graphic.

John Watson

9:55 AM (10 minutes ago)

to me

Jessi,

Yes you may use those tables for your dissertation, provided that attribution to Evergreen Education Group is given.

I'd love to see your dissertation when it's published.

Thanks,

John

Appendix B

Survey

1. Do you currently teach in both the brick-and-mortar classroom and online?

2. How long have you been teaching in the online setting?

3. How many years have you been teaching in the brick-and-mortar setting?

4. I earned my teacher certification

5. Are you male or female?

6. To what degree are you comfortable using technology in your brick-and-mortar classrooms?

7. To what degree are you comfortable using technology in your online classrooms?

8. To what degree do you use threaded discussions in your brick-and-mortar classrooms?

9. To what degree do you use threaded discussions in your online classrooms?

10. To what degree do you use asynchronous instruction (recorded lectures, social networking, and collaborative documents) in your brick-and-mortar classrooms?

11. To what degree do you use asynchronous instruction (recorded lectures, social networking, and collaborative documents) in your online classrooms?

12. How often do you use synchronous tools (phone calls, Instant Messenger, Skype) with students in your brick-and-mortar classroom?

13. How often do you use synchronous tools (phone calls, Instant Messenger, Skype) with students in your online classroom?

14. To what degree do you use online collaboration groups in your brick-and-mortar classrooms?

15. To what degree do you use online collaboration groups in your online classrooms?

16. To what degree do you provide feedback within 24 hours on teacher graded assignments in your brick-and-mortar classrooms?

17. To what degree do you provide feedback within 24 hours on teacher graded assignments in your online classrooms?

18. To what extent are you open to integrating new technology into your brick-and-mortar classrooms?

19. To what extent are you open to integrating new technology into your online classrooms?

20. Have your attitudes and beliefs toward technology impacted the use of technology in your brick-and-mortar classroom?

21. Have your attitudes and beliefs toward technology impacted the use of technology in your online classroom?

22. How have your attitudes and beliefs toward technology impacted the use of technology in your brick-and-mortar and online classrooms?

23. How do you monitor and observe students' academic progress in your online classrooms?

24. How has your experience with the use of technology in your online classroom impacted the use of technology in your brick-and-mortar classroom?

Appendix C

Successful Practices and Supporting References

General Characteristics	
Practice:	**References:**
MV teachers go the extra mile to support student learning	(Fenstermacher & Richardson, 2005; Hutchings & Shulman, 1999; Konings, Brand-Gruwel, & van Merrienboer, 2005; Scheines, Leinhardt, Smith, & Cho, 2006)
MV teachers are skilled with the basic uses of technology	(Berge & Collins, 1995; Lee & Hirumi, 2004a; O'Neil, 2006; Schoenfeld-Tacher & Persichitte, 2000)
VS teachers are interested in and enjoy exploring new technologies that have potential value for virtual school environments	(Hartley, 2007; Hsi, 1999; Hughes, McLeod, Brown, Maeda, & Choi, 2005; Muirhead, 2001; Salpeter, 2003)
VS teachers are flexible with their time	(Easton, 2003; Kurtz, Beaudoin, & Sagee, 2004b; Lazarus, 2003)
VS teachers have a deep understanding of the varying learning styles of their students	(Chickering & Gamson, 1987, 1999; Fenstermacher & Richardson, 2005; Hein & Budny, 1999; Muir, 2001; Neuhauser, 2002; Papanikolaou, Grigoriadou, & Samarakou, 2005; Valenta & Therriault, 2001)
VS teachers establish a presence in the course to motivate students	(Anderson, 2008a; Bellon & Oates, 2002; Carey, Wallace, & Carey, 2001; Smith & Dillon, 1999; Weiner, 2003)
VS teachers have good organizational skills	(Davis & Niederhauser, 2007; Savery, 2005; Swan, 2003)
VS teachers use student and course data, as well as other sources of information available to them to self-evaluate the pedagogical strategies they use	(Lee & Hirumi, 2004a)
VS teachers have extensive knowledge of and appreciation for the content area they teach	(Gudmundsdottir, 1990; Lee & Hirumi, 2004a; Peck & Gould, 2005; Shulman, 1986; van Driel, Verloop, & de Vos, 1998)
VS teachers understand the impact of course pacing on course design and the pedagogical strategies they use	(Cavanaugh et al., 2004; Löfström & Nevgi, 2007; Swift & Gooding, 1983)
VS teachers continually extend their content and technological knowledge	(Darling-Hammond, 2000; Hughes et al., 2005; O'Neil, 2006; Pape, Adams, & Ribeiro, 2005; Salpeter, 2003)
VS teachers are committed to the opportunities offered by virtual high schools	(Pajares, 1992; Prawat, 1992; Richardson, Anders, Tidwell, & Lloyd, 1992)
Classroom Management Strategies	
Practice:	**References:**
VS teachers use strategies to address inappropriate or abusive behavior of students in public forums of the course	(Davis, Farnham, & Jensen, 2002; Waterhouse & Rogers, 2004)
VS teachers monitor venues of public communication in their course to identify students in personal crisis	(Connor-Greene, 2000; Whitlock, Powers, & Eckenrode, 2006)
Pedagogical Strategies: Assessment	

Practice:	References:
VS teachers use multiple strategies to assess student learning	(Borland, Lockhart, & Howard, 2000; Campbell, Floyd, & Sheridan, 2002; Carey et al., 2001)
VS teachers use alternative assessment strategies that allow students the opportunity to represent their knowledge in ways that are personally meaningful	(Anderson, 2008a; McCombs & Vakili, 2005; Von Secker & Lissitz, 1999)
VS teacher use alternative assessment strategies to accommodate the varying learning styles of their students	(Graham, Cagiltay, Lim, Craner, & Duffy, 2001; Krämer & Schmidt, 2001)
Pedagogical Strategies: Engaging Students with Content	
Practice:	**References:**
VS teachers build in course components to reflect the interests of students enrolled in the course	(Bellon & Oates, 2002; McCombs & Vakili, 2005; Palloff & Pratt, 1999; Shin, 2006; Vandergrift, 2002)
VS teachers are flexible in their use of pedagogical strategies to accommodate varying learning styles	(Coppola, 2002; Gudmundsdottir, 1990; Herring, 2004; Vrasidas & McIsaac, 2000)
VS teachers establish strong relationships with mentors	(Davis & Roblyer, 2005; Feiman-Nemser, 2001; Kurtz et al., 2004b)
VS teachers use multiple strategies to form relationships that support rich interactions with students	(Coppa, 2004; Coppola, 2002; Swan, 2004a, 2004b; Swift & Gooding, 1983; Woods & Ebersole, 2003)
VS teachers motivate students by clearly organizing and structuring content	(Anderson, 2004b; Bellon & Oates, 2002; McCombs & Vakili, 2005)
VS teachers embed deadlines within the content structure to motivate students in self- paced courses to complete course requirements	(Graham et al., 2001)
VS teachers provide students with multiple opportunities to engage content in ways that suit varying learning style.	(Hein & Budny, 1999; Neuhauser, 2002; Shin, 2006)

Pedagogical Practices: Making Course Meaningful for Students	
Practice:	**References:**
VS teachers use strategies to connect with students	(Coppola, 2002)
VS teachers engage students in conversations about content and non-content related topics to form a relationship with each student	(Berge & Collins, 1995; Hara, Bonk, & Angeli, 1998; Kanuka, Liam Rourke, & Laflamme, 2007; Oren, Mioduser, & Nachmias, 2002)
VS teachers encourage and support communication between students	(Blignaut & Trollip, 2003; McIsaac & Craft, 2003; Swan et al., 2000)
VS teachers seek out and make available a variety of supplemental support tools to meet the diverse needs of students	(Koszalka & Bianco, 2001; Papanikolaou et al., 2005; Phipps & Merisotis, 2000)

Pedagogical Strategies: Providing Support	
Practice:	**References:**
VS teachers monitor student progress closely and interact with students to determine where gaps in knowledge may exist.	(Bransford, Brown, & Cocking, 1999)

Pedagogical Strategies: Communication & Community	
Practice:	**References:**
VS teachers facilitate the formation of community by encouraging content and non-content related conversations among students	(Bernard, Rubalcava, & St-Pierre, 2000; Gunawardena, 1995; Swan, 2004b)
VS teachers interact with students using multiple channels of communication (telephone, IM, etc) provide support	(Howell, 2001; Kanuka et al., 2007)
VS teachers provide students with quick feedback to maintain their motivation for completing the course	(Swan, 2004b; Swift & Gooding, 1983)
VS teachers model what 'formal' online communication looks like in discussion boards and e-mails.	(Rovai, 2002)
VS teachers effectively monitor the tone and emotion of their communications with students	(Rovai, 2001, 2002)

Technology	
Practice:	**References:**
VS teachers purposefully tie the use of tools built into the course environment to state benchmarks and standards to support student learning of content	(Frydenberg, 2002; Revenaugh, 2004; U. S. Department of Education, 2005)
VS teachers consider issues of student access to technology when integrating web based components into their course	(U. S. Department of Education, 2005)
VS teachers use their content knowledge and knowledge of students to drive the integration of technology	(Ferdig, 2006; Lee & Hirumi, 2004b; Shulman, 1986; van Driel et al., 1998)

Appendix D

Approval of Research Site

Page 1 of 4

RESEARCH AGREEMENT BETWEEN

██████████████████

AND

Jessi Sigander

This agreement ("Agreement") is made this 26th day of February, 2016 (the "Effective Date"),

by and between ██████ with a business address located at ███████████████████

█████████████ and Jessi Sigander, with an address of ███████████████████

██████ ("Student"), each individually a "Party" and collectively the "Parties".

SCOPE

1.1 Student will be undertaking research for her own educational requirements to complete a

study on best practices of secondary school teachers in virtual education. The study will involve

the examination of validated survey information with survey information gathered by Student

from secondary school teachers.

1.2 Each school and/or participating teacher in the study shall execute their own release form,

granting Student permission to conduct collect survey information.

1.2 Student understands that she will not be given access to any "Education Records," as that

term is defined in the Family Educational Rights to Privacy Act or other applicable law.

RELATIONSHIP OF THE PARTIES

2.1 Nothing in this Agreement is intended to create an employment relationship, company, partnership, joint venture, association or other legal entity of any kind or for any purpose as between the Parties. No Party will have any authority to bind or commit the other Party, or cause the other Party to incur any liability or obligation, for any purpose without the express written consent of the other Party and either Party has the right to enter into the same or similar relationships with other Parties.

RIGHT TO PUBLISH

3.1 ▮ understands that results or other information based in whole or in part on the Study may be embodied in Student's final dissertation or such other document as is necessary for Student to complete his doctoral research study through Northwest Nazarene University. (collectively, "Presentations and Publications"). If, however, any Presentations and Publications contain ▮ Identifying Information, ▮ must be furnished notice including copies of any proposed Presentations and Publications at least four (4) weeks in advance of the earlier of their publication or submission to a third party. ▮ shall have two (2) weeks after receipt of said copies, to object, in its sole discretion, to the use of the ▮ Identifying Information. In the event that ▮ makes such objection, Student shall remove from such Presentations and Publications

the ▮Identifying Information. ▮Identifying Information shall mean all information, either

by itself Page 2 of 4

or in combination with other publicly available information, from which a person could

reasonably be expected to be able to identify ▮.

3.2 Student will comply with any request by ▮ that the following statement be included in any

publication related to the Study: "The opinions, findings, and conclusions expressed in this

publication are those of the authors and not necessarily those of ▮."

INTELLECTUAL PROPERTY AND OTHER AGREEMENTS

4.1 Nothing in this Agreement is intended to transfer, grant, deny, license or provide permission

with respect to any rights in any intellectual property of a Party to this Agreement.

PROTECTION OF HUMAN SUBJECTS PARTICIPANTS

5.1 In accepting this agreement, Student warrants that the participation of all human subjects in

this research project has been reviewed and approved by the cognizant Institutional Review

Board in accordance with DHHS Regulations (45 CFR, Part 46). The Principle Investigator

assigned for directing the performance of work of the Study is Dr. Bill Fritz, whose contact

information follows: Email - wfritz@nnu.edu, Phone ▮. If, for any reason, that

person is no longer the Principle Investigator, Student shall notify ▮ as soon as practicable

but, in any event, within thirty (30) days thereafter, of the name of the new Principle

Investigator.

TERM AND TERMINATION

6.1 This Agreement shall terminate one (1) year from the Effective Date of this Agreement. Notwithstanding the forgoing, this Agreement can be terminated a) at any time for material breach upon provision of written notice and an opportunity to cure not to exceed 30 days, or b) for any reason upon one (1) month written notice, in which case reasonable efforts shall be made to minimize disruption of the Study.

USE OF NAME AND PUBLIC ANNOUNCEMENTS

7.1 Student shall not use the name of ▮▮▮ or any of its affiliates, employees or school names including any of its related logos, in any publication, without the prior written approval ▮▮▮▮.

LIABILITY

8.1 Student agrees to accept the responsibility for injury or damage to any person or persons or property that arise out of Student's negligent acts or omissions in connection with this Agreement.

WARRANTIES AND REPRESENTATIONS

9.1 Neither Party guarantees any specific results of the study. Page 3 of 4

9.2 Student represents that she understands that any grade, evaluation or degree she receives in connection with the Study is based solely on her own work and that ███ bears no responsibility for any such grade, evaluation or degree.

9.3 THERE ARE NO WARRANTIES, CONDITIONS, COVENANTS OR REPRESENTATIONS (EXPRESSED OR IMPLIED) INCLUDING WITHOUT LIMITATION THE FITNESS OF A PARTICULAR PUPOSE, OR MERCHANABILITY GRANTED BY EITHER PARTY IN THIS AGREEMENT.

OTHER OBLIGATIONS

10.1 Non-Assignment. Student shall not have the right to assign any duty or responsibility arising hereunder without the prior written consent of ███. Any assignment without such consent is void from its beginning.

10.2 Notices. All notices shall be in writing mailed via certified mail, return receipt requested, or by reputable overnight courier addressed as follows, or to such other address as may be designated from time to time. If to ███, to the Executive Vice President of School Services at the address set forth above. If to the Student, to her at the address set forth above. Notices shall be deemed given as of the date received.

10.3 Entire Agreement/Modification. This Agreement constitutes the entire agreement between the parties and may be amended only in writing signed by all parties.

10.4 Waiver. The failure of either party to enforce any of the provisions hereof will not be construed to be a waiver of the right of such party thereafter to enforce such provisions or any other provisions.

10.5 Severability. If any provision of this Agreement is declared void, such provision will be deemed severed from this Agreement, which will otherwise remain in full force and effect.

10.6 Survival. Sections 3.1, 3.2, 4.1, 4.2 and 8.1 of this Agreement survive the termination of the Agreement.

[SIGNATURE PAGE FOLLOWS] Page 4 of 4

IN WITNESS WHEREOF, the Parties have caused this Agreement to be executed by their duly authorized representatives.

JESSI SIGANDER

By: _____

Date: _____

███████████████████

By: _____

Title: _____

Date: _____

Appendix E

HRRC Approval

Dear Jessi,

The HRRC has reviewed your protocol: Protocol #9042016 - BEST PRACTICES IN K–12 ONLINE TEACHING: A QUANTITATIVE STUDY EXPLORING SECONDARY CLASSROOMS ONLINE AND BRICK-AND-MORTAR CLASSROOMS. You received "Full Approval". Congratulations, you may begin your research. If you have any questions, let me know.

Curtis Garner

Northwest Nazarene University

HRRC Member

623 S University Blvd

Nampa, ID 83686

You can go here to view the submission:

Certificate of Completion

The National Institutes of Health (NIH) Office of Extramural Research certifies that **Jessi Sigander** successfully completed the NIH Web-based training course "Protecting Human Research Participants".

Date of completion: 01/16/2015

Certification Number: 1652410

Appendix F

E-mail Sent to Participants

Dear Online Teacher,

You have been chosen to take part in this survey because of your expertise in secondary online education. This survey is part of a quantitative research study and has been approved by Northwest Nazarene's Institutional Review Board for Human Subjects through Northwest Nazarene University. The purpose of the study is to identify best practices teachers use in online secondary classrooms and brick-and-mortar classrooms.

All responses are confidential and anonymous. Your participation or not will have no effect on your employment. The survey will be open until September 30th, 2016. Upon completion of the survey, your email address will be entered into a drawing for two $50.00 visa gift cards.

The survey will take approximately five minutes to complete. Please click on the following link to begin. I appreciate your honest responses to the questions in the survey.

Please let me know if you have any questions and thank you for your time.

Jessi Sigander

Appendix G

Technology in the Classroom

TEACHERS EMBRACE DIGITAL RESOURCES TO PROPEL LEARNING

74% of Teachers Say

"Educational Technology is a Student-Motivator"

More than two-thirds of teachers want more classroom technology

And up to **75%** of teachers in low-income schools

Most beneficial uses of tablets and e-readers for teaching

71% Educational applications

64% Educational websites

60% Educational e-books/textbooks

Benefits of Educational Technology

74% Reinforce and expand content

74% Motivate students to learn

73% Respond to a variety of learning

69% "Do much more than ever before" for my students

65% Demonstrate something I can't show in any other way

Available Technologies in the Classroom

90% Personal computer or PC

59% Interactive Whiteboards

36% Handhelds (including cell phones, smart phones)

35% Tablets/electronic readers

Most Commonly Used Tech Resources

48% Online lesson plans

45% Web-based interactive games and activities

44% Websites to deliver class information

43% Online video, images and articles

Study Methodology
The survey spanned 503 web-based interviews with US pre-K-12 teachers. The survey was conducted January 15-20, 2013, by VeraQuest, Inc. and has a margin of error of +/- 4.4% at a 95% confidence level.

More than **one-third** of teachers said they use a tablet or e-reader in their classroom, up from **20%** a year ago.

PBS LearningMedia™
pbslearningmedia.org