STUDENT ENGAGEMENT: BEST PRACTICES IN TEACHING

IN A K-5 BLENDED LEARNING ENVIRONMENT


A Dissertation

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by

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AUTHORIZATION TO SUBMIT

DISSERTATION

This dissertation of Cynthia Prouty, submitted for the degree of Doctor of Education with a major in Educational Leadership and titled "Student Engagement: Best Practices in Teaching in a K-5 Blended Learning Environment" has been reviewed in final form. Permission, as indicated by the signatures and dates given below, is now granted to submit final copies.

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Jesus replied, "What is impossible with men is possible with God" (Luke 18:27).

DEDICATION

This dissertation is dedicated to my husband, Jim, who has been supportive of all of my educational endeavors and pursuits! I truly appreciate your love and patience.

ABSTRACT

This study was designed to involve a variety of research methods, resulting in a mixed methods, case study approach to investigate best teaching practices in an elementary blended learning environment. The research-based evaluation work of Charlotte Danielson was incorporated as the theoretical framework for this research. Differing methods of tablet use were observed in 10 classrooms while data was collected on student engagement. Blended learning is among best teaching practices, though surprisingly, educators in this study were not familiar with blended learning models and techniques. The term "blended learning" in the context of this K-5 study meant utilizing different technology devices as a means to enhance teaching. Many educators are utilizing tablets in their classrooms on a daily basis without adequate professional development. The influx of tablets in America's schools has not been well planned nor have professional development opportunities provided teachers with the necessary training to fully implement and integrate best practice in their classrooms. Findings from this study help fill the gap in elementary level and rural area schools. Results from this research indicate that blended learning tools enrich the elementary school classroom. Tablet usage in this study demonstrated seamless bridging all levels of academic achievement. Students were observed utilizing metacognitive skills when collaborating with their peers and demonstrating their learning through projects on their tablets. Three themes emerged from the interview data. First, blended learning and the integration of technology as a best practice supports current literature. The second theme was, professional development, including teachers' desire for both building- and district-level support as well as the frequency of professional development, and teacher technology support. And third, the school as the vehicle for teacher collaboration, differentiation for students, and engagement of students.

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# Chapter I

# Introduction

**Entry Vignette**

Ms. Smith's first-grade public elementary school classroom has tablet devices on the desk of each student. Little 6- and 7-year-old fingers swipe their touch tablet screens effortlessly using the engaging technology tool to write their names and complete the morning's entry assignment. No one is off-task. Ms. Smith transitions into a math lesson. She reminds students what they learned from the previous day's math lesson and then introduces a new application (app) called Hands-On Math, Tools for Active Teaching and Learning, Base Ten Blocks (Ventura, 2011). Students watch Ms. Smith use her tablet via an interactive whiteboard connected to her tablet screen. Ms. Smith demonstrates how the virtual pen in the app can be used to make an "H" style chart for the ones, tens, and hundreds columns. Ms. Smith shows students how to move blocks of numbers into columns and how to move single blocks into the ones column.

Students then begin working from their individual tablets, as this classroom has one tablet for every student. All 26 students are working on their tablet devices at their desks. Out of 26 students, there is only one student with a question. Twenty-five of the students understand the task. When one student, Samantha, does not understand, Ms. Smith borrows Samantha's tablet to display her work on the interactive whiteboard for the class to see. She asks the class to help Samantha with her math blocks. The students volunteer information about how to correct the math problem. Ms. Smith asks Samantha to repeat what she needs to do differently, and the student clearly understands what she is to do.

Student engagement is more than being on-task. Engagement includes the student's being drawn into the lesson to the degree that the tools provided give students some level of control over the pace of their own learning, as demonstrated in Ms. Smith's first-grade class. Twenty-six first-grade students on-task for a full 30-minute lesson, emerging from the lesson writing the number 123, and it is only the month of October—the classroom instructional strategy appears to engage all students.

In the fifth-grade classroom, Mr. Jones has his students working on a social studies lesson. The students have been reading different stories about Native Americans and are applying the lesson by making a short video explaining what they have learned. Mr. Jones has two students per tablet (2-to-1). Through experience, Mr. Jones has determined that partnering students with similar skills works best in his class. Mr. Jones uses the interactive whiteboard (IW) to have students explain the different apps they can use for the assignment. One student stands in front of the class with her tablet and demonstrates the Tellagami app (see Figure 1) while the whole class can collectively view her screen on the IW (Tellagami Labs, 2014). On the screen is a character who uses the student's recorded voice so it appears as though the student is a narrator in Tellagami. She has chosen the character's eye color, hair color, skin tone, and other personalized features to use for her presentation, called Gami. Another student demonstrates the SuperHero app; yet another shows the SockPuppet app. Students choose which of the three apps they will use and take turns reading and working with their partners to record their videos. At the fifth-grade level, the students are leading the discussion and demonstrating higher levels of learning, such as synthesis, as identified in Bloom's taxonomy (Bhuyan, & Khan, 2014; Bloom, Engelhart, Furst, Hill, & Krathwohl, 1956).

Figure 1

*Tellagami App*



SOURCE: Tellagami Labs, Inc.

**Introduction and Background**

Student engagement is more than a child's being on-task or immersed in an educational task; student engagement comprises academic, cognitive, and behavioral characteristics (Christenson, Stout, & Pohl, 2012; Eccles & Wang, 2013; Finn & Zimmer, 2013; Reeve, 2013; Reschly & Christenson, 2013). Observable engagement is easiest to see in academic behavior like on-task conduct, homework completion, involvement in class activities, high attendance, great participation, and limited behavioral incidents (Christenson, Stout, & Pohl, 2012). Increasing student engagement is a consistent goal in instruction, and one instructional technique frequently used toward this goal is the use of technology in the classroom (Fullan, 2014; Sheninger, 2014; Stein & Graham, 2014).

Using some form of technology in the classroom is essential in this digital world: taking attendance on the computer, using a document camera or other device to project instruction, communicating with parents and staff members through email, maintaining classroom websites, and using the Internet for research are some typical examples. The use of a tablet device is becoming more common as well (Fullan, 2014; Getting & Swainey, 2012; Huang, Clark, & Wedel, 2013; McLester, 2012; Sheninger, 2014; Stein & Graham, 2014). The integration of tablet devices has enhanced and enriched classroom instruction. Using a tablet does not require the ability to read, write, or have strong keyboarding skills, so even students as young as preschool age can engage in this tactile learning method (Getting & Swainey, 2012; Huang, Clark, & Wedel, 2013; McLester, 2012).

The extent of technology use and the types of devices employed in the classroom are affected by the following realities:

- Technology devices are expensive.
- Stakeholders want to know if implementing tablet technology is enhancing achievement.

Technological devices are tools that can be used as best practice in education when they are integrated into effective pedagogical methods. Effective pedagogical practices such as Charlotte Danielson's (2013) frameworks for teaching (see Chapter II), in amalgamation with regularly planned and demonstrated technological professional development instruction for teachers, could increase the extent and effective usage of technology devices.

**Statement of the Problem**

Dr. Yong Zhao, author of *Catching Up or Leading the Way* (2009), notes that the United States leads the way in terms of enhancing creativity, developing entrepreneurs, and creating a

diverse workforce. He describes how, conversely to U.S. students, students in other nations are intentional in developing their career interests as young as kindergarten, and the focus is shifting away from administering standardized measurements as the primary means to assess a child's understanding of different content areas. There is a worldwide shift recognizing and valuing each child as unique, and meanwhile in the U.S., a national shift has occurred toward standardization, as 45 states in the U.S. have adopted Common Core State Standards (Danielson, 2012; Fullan, 2014; Murphy & Regenstein, 2012). Fullan (2014) says Common Core State Standards (CCSS) have been "endorsed by over 90 percent of the states" (p. 24). Fullan refers to CCSS pressures as "unbearable" as "tensions are growing between, on the one hand, an urge to tighten the focus around standards and, on the other hand, a tendency to allow digital innovations to flourish" (p. 7).

Although educational standardization is trending, a movement toward educational individualization is also strengthening. Researchers forecast that by 2019, the offering of digital high school classes will increase to 50% of all class offerings (Horn & Staker, 2011; Werth, Werth, & Kellerer, 2013). Transforming education through accessible and custom blended classes, disruptive innovation has far-reaching potential (Christensen, Horn, & Johnson, 2011; Horn & Staker, 2011; Werth, Werth, & Kellerer, 2013). A formal education program, blended learning utilizes digital delivery for a portion of the learning experience, while involving a degree of student regulation over the location, time, and pace (Christensen, Horn, & Staker, 2013; Horn & Staker, 2012; Pointek, 2013b). Of great significance in blended learning is the ability to differentiate instruction for all levels of learners, as well as the ability to reach diverse students (iNACOL, 2013). Educators and families may prefer the fusion of face-to-face

traditional instruction with technology-based learning integration rather than purely digital methods (Wolpert-Gawron, 2011; Pointek, 2013b; Werth, Werth, & Kellerer, 2013).

Research has shown that blended learning environments and the integration of technology in classroom activities can be effective for many students (Beaudry, 2011; Lefton, 2012; Richardson, 2010; Riddle, 2010; Rosen & Beck-Hill, 2012; Ruiling & Overbaugh, 2009). The term "blended learning" in the context of this K-5 study means utilizing different technology devices as a means to enhance teaching (Christensen, Horn, & Staker, 2013; Horn & Staker, 2012; Pointek, 2013b). However, there is a lack of digital transformation in the public school system (Bauland, 2012; Hoyle & Kutka, 2008; Lefton, 2012; Quillen, 2010; Richardson, 2010; Riddle, 2010; Ruiling & Overbaugh, 2009).

The integration of blended learning environments and technology has been slow for several reasons. There is no systematic way to implement technology in public schools, as funding is variable depending on district allocations and whether teachers spend their professional development money towards technology. A school district's maintenance and capacity-building progress is also a factor. Public school technology integration is varied from district to district and state to state, though clearly a financial commitment is required to successfully deliver blended learning options (Bauland, 2012; Chong, 2012; Hoyle & Kutka, 2008; Lefton, 2012; Riddle, 2010; Ruiling & Overbaugh, 2009).

Although many classrooms have some type of technology, finding and adopting effective teaching strategies is a matter of exploration, professional development, adoption on a small scale, and having an understanding of blended learning as a method of best practice instruction. Efforts to utilize technology in the classroom are notable, though the integration of devices into instructional practices is often overlooked (McGee & Reis, 2012). A review of literature

indicates that there is limited knowledge of both blended learning as a best teaching practice and the need for consistent professional development in technology integration (Beaudry, 2011; Bennett, 2012; Gathany, 2012; Lefton, 2012; Pass, 2008; Riddle, 2010; Ruiling & Overbaugh, 2009). An empirical inquiry on the role of technology is required in developing means of instruction that are more effective than traditional methods (Johnson, 2012; Pacansky-Brock, 2013; Yin, 2014). Conducting a research-based study in a public elementary school with different methods of tablet utilization could bridge the gap between the identification of professional development needs in tablet technology integration and the engagement of students. In order for students to be impacted, teachers must first know where technology fits into good pedagogy.

**Research Questions**

The intent of this study was to construct and explore several worthy research questions (Creswell, 2014; Marshall & Rossman, 2011; Merriam, 1988; Stake, 1995; Yin, 2014). Educators know that factors of engagement are indispensable to educational achievement (Finn & Zimmer, 2013). The researcher's desire to find the best way to engage K-5 students through teaching practices in blended learning led to these three primary questions:

1. What tablet methodology supports best practices in a K-5 blended learning environment?
2. How does tablet use impact student engagement?
3. With an increase in the use of tablets in classrooms, what are teacher perceptions of professional development and needs?

**Description of Terms**

Constant changes in technology and ever-expanding options for educators and their students make it important to create a clear understanding of terminology utilized in this

study. Describing and assigning meaning to terms adds clarity in a research study (Creswell, 2014; Marshall & Rossman, 2011; Merriam, 1988; Stake, 1995; Yin, 2014). The following is a current, research-based list of terms used in this study.

**Blended learning.** As depicted in Figure 2 from the Clayton Christensen Institute, blended learning is a formal education program in which a portion of the learning is at a brick-and-mortar location (Christensen, Horn, & Staker, 2013; Horn & Staker, 2012; Pointek, 2013b). The term blended learning in the context of this K-5 study means utilizing different technology devices as a means to enhance teaching (Christensen et al., 2013; Horn & Staker, 2012; Pointek, 2013b). Although most elementary schools do not employ all of the models of blended learning, it is helpful for educational practitioners learning about blended learning to have a comprehensive understanding of the models and terminology that exist.

Figure 2

*Blended Learning Taxonomy of Education Practice*
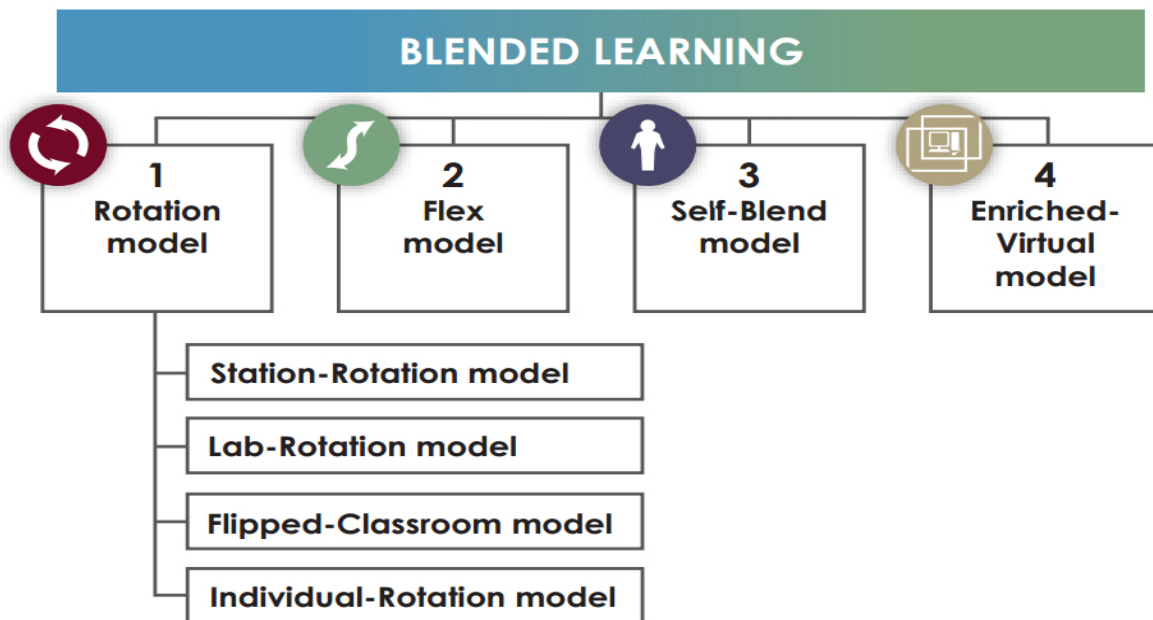


SOURCE: Clayton Christensen Institute (2012)

The rotation model is primarily utilized in this study (Christensen, Horn, & Staker, 2013). A variety of models are frequently employed at the high school level for credit retrieval, advanced course opportunities, and specific interests, or for those high schools located in rural areas where limited foreign language or other advanced classes are available (Christensen et al., 2013).

**Blended learning models.** There are several models within the context of blended learning. The use of tablets can be integrated into any of the models listed.

1. ***Rotation model***. Students rotate on a set schedule or at the instructor's direction. Christensen, Horn, and Staker (2013) report that students in this model rotate "between learning modalities, at least one of which is online learning," within a class such as math (p. 28). Christensen et al. (2013) state that "other modalities in the rotation model might include small-group or full-class instruction, group projects, individual tutoring, and pencil-and-paper assignments. The rotation model has four submodels: station-rotation, lab-rotation, flipped-classroom, and individual-rotation" (p. 28).

    a. *Station-rotation model*. Within a controlled classroom setting, the learners rotate (Christensen et al., 2013). The station-rotation model is also known as the in-class or classroom rotation model.

    b. *Lab-rotation model*. A rotation transpires for students between a classroom and an educational lab setting on a set schedule (Christensen et al., Horn, & Staker, 2013). The learning environment may be rotated using more than one location instead of one set space.

c.  *Individual-rotation model.* Students can choose and individualize which modalities to rotate through, though they may not utilize all accessible modalities (Christensen et al., 2013).

d.  *Flipped-classroom model.* Teachers can video record a lesson that students watch at home as a part of their homework in the flipped-classroom model. Classroom time is freed for students to work in collaboration with others, which provides potentially more opportunities for differentiation. (Brunsell & Horejsi, 2013; Christensen et al., 2013).

2.  **Flex model**. Although the instructor of record is on site in the flex model, an individually tailored, fluid schedule for students is created among diverse learning modalities. Sometimes students are directed to offline activities. (Christensen et al., 2013).

3.  **Self-blend model**. This model allows learners to take online classes to enrich traditional education in the classroom, and is often seen at the high school levels (Pointek, 2013b).

4.  **Enriched-virtual model**. Within a course, the enriched-virtual model learners split their time attending a brick-and-mortar campus and learning remotely using online delivery of content (Christensen et al., 2013).

**Brick-and-mortar schools**. Brick-and-mortar schools, in contrast to online schools, are buildings containing traditional learning environments with face-to-face, teacher-led instruction (Horn & Staker, 2012; iNACOL, 2011).

**Disruptive innovation theory**. Termed by Clayton Christensen of the Clayton Christensen Institute, disruptive innovation theory is the idea of transforming a product that was

expensive and inaccessible to others and making the product reasonably priced and available to others (Christensen et al., 2013).

**Guaranteed and viable curriculum (GVC)**. All students will learn with equal opportunities, guaranteed (DuFour & Marzano, 2011; Kopra, 2012; Marzano, 2003). Assessments are developed from the curriculum being taught, students have time to learn, teachers have a suitable amount of time to instill content, and it is viable when sufficient time is safeguarded to impart all determined content (DuFour & Marzano, 2011; Kopra, 2012; Marzano, 2003).

**Information and communication technologies (ICT).** Sometimes ICT is used as a synonym for information technology (IT). Information and communication technologies highlight the role of unified communication, such as real-time and non-real-time communication modalities (Kumar, 2014; Twining, Raffaghelli, Albion, & Knezek, 2013; Velez, 2012). Teachers' application of ICT requires training and preparation (Twining et al., 2013).

**Not on-task.** Students who are not on-task exhibit disengagement behaviors such as disinterest, boredom, unwillingness, and avoidance of tasks (Skinner & Pitzer, 2013).

**On-Task.** Students who are on-task exhibit engagement behaviors such as effort, hard work, focus, attention, interest, and willing participation (Skinner & Pitzer, 2013).

**Positive behavior supports**. This is a classroom, and ideally school-wide, behavior initiative to minimize disciplinary referrals that reduce valuable instructional time. It is based on the framework of positive behavioral instructional support, known as PBIS (Horner & Sugai, 2000).

**Student engagement**. There are several models of student engagement: behavioral, emotional (Fredricks, Blumenfeld, & Paris, 2004), academic, social, affective (Finn & Zimmer, 2013), cognitive (Fredricks, Blumenfeld, & Paris, 2004), and psychological (Anderson, Christenson, & Lehr, 2004). Figure 3 illustrates the model utilized.

Figure 3

*Student Engagement Model*



(Appleton et al., 2008)
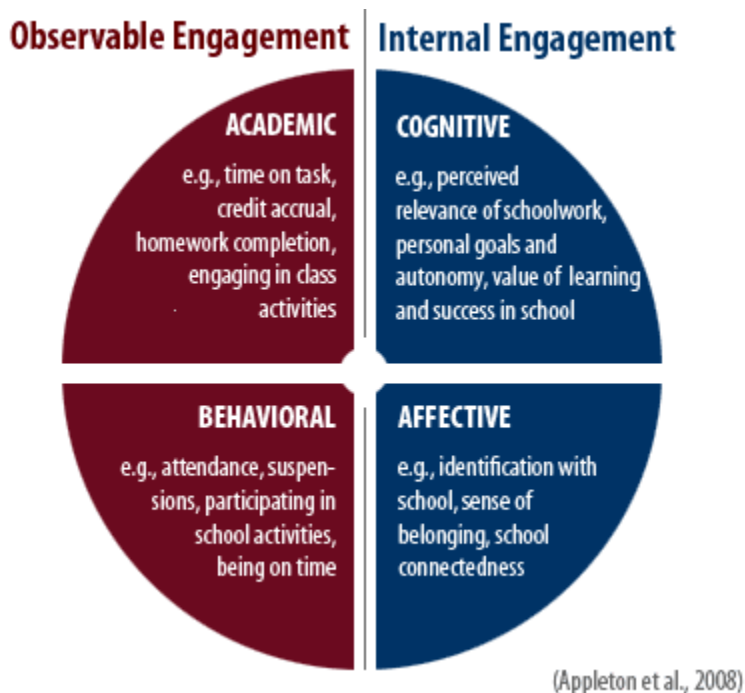
For purposes of this research study, application of the model demonstrated in Figure 3 was employed (Appleton, Christenson, Kim, & Reschly, 2006; Christenson, Reschly, Appleton, Berman, Spanjers, & Varro, 2008). The specific aspects of observable engagement that this study explored were on-task and off-task behaviors of students in a rural elementary school.

**Tablets.** Tablets are small, lightweight, handheld, touch screen, Internet-connected devices that allow input on a screen via a stylus or finger as opposed to an external keyboard (Fredette, 2012; Gentile, 2012; McLester, 2012; Miller, Moorefield-Lang, & Meier 2012;

Pickett, 2012; Reiss, 2013). The site school used Apple iPads, though correlations can easily be made between the various tablet manufacturers.

**Significance of the Study**

This study explores best teaching practices in a public elementary school setting with technology devices integrated into the classroom. Specifically, this study addresses tablet usage in an elementary school blended learning environment. In addition, the study addresses aspects of technology use that affect student engagement and achievement. Multiple factors impact student success, though engagement can be a predictor of student outcomes (Anderman & Patrick, 2013; Finn & Zimmer, 2013; Reeve, 2013; Reschly & Christenson, 2013; Skinner & Pitzer, 2013). And finally, this study deals with the professional development needs of teachers to increase their skills and abilities to use tablets in a deeper and more intentional approach (Ackerman, 2009; Beaudry, 2011; Colandrea, 2012; Karl, 2011; Mishne, 2012).

This study is significant because blended learning at the elementary level in a public school setting is not well recognized or known as a method of best instructional practice. An examination or inquiry such as this can enhance the body of literature for educators and for further research (Creswell, 2014; Marshall & Rossman, 2011; Merriam, 1988; Stake, 1995). As embedding technology into learning is an ongoing practice that varies greatly depending on funding, leadership, and professional development practices (Beaudry, 2011; Goldstein, 2010; Shaw, 2010; Velez, 2012), considerations need to be made in teacher training for exemplary implementation of best teaching practices in blended learning environments. Generalizations from this study may inform other districts about successfully integrating technology devices into the classroom.

**Theoretical Framework**

Charlotte Danielson's *The Framework for Teaching: Evaluation Instrument, 2013 Edition*, was utilized as the theoretical framework in this study. Danielson provides a four-domain rubric as an instrument for teacher evaluation (see Tables 1-4). The domains include planning and preparation, the classroom environment, instruction, and professional responsibilities.

Critical attributes and examples of each rubric level are provided in the framework, as well as elements of each component and indicators (Danielson, 2013). Domain 1 is organized around best practice in teaching, demonstrating knowledge of content and pedagogy. An unsatisfactory teacher rating, Level 1, may indicate that the teacher makes content errors, uses inappropriate strategies, and lacks consideration for prerequisite knowledge and planning in the lesson. Level 2, basic, may indicate that the teacher is familiar with concepts though lacks awareness of how the concepts relate to one another. A proficient teacher in this example, Level 3, displays a solid knowledge of the discipline or content area and how concepts relate to one another, provides clear explanations, answers students' questions accurately, and uses strategies in the unit and lesson plans that are suitable to the content. Finally at the distinguished level, Level 4, the teacher displays extensive knowledge of important concepts and how those concepts relate to one another and to other disciplines, and uses plans that reflect recent developments in content-related pedagogy. In addition to print materials, digital training tools, and assessment programs of Danielson's framework, other supports and resources are available through The Danielson Group website (http://www.danielsongroup.org/). The application of Danielson's work, in conjunction with best teaching practices including blended learning, should positively impact student outcomes. Higher levels of student engagement would be predicted.

**Overview of Research Methods**

A mixed methods design was employed for this study as it allowed the researcher to combine quantitative and qualitative data in different forms (Creswell, 2014; Creswell & Plano Clark, 2007; Yin, 2014). A case study was selected so the researcher could use a variety of information and was not limited to one type of data collection (Creswell, 2014; Merriam, 1988; Stake 1995; Yin 2014). Yin (2014) describes case study research as a linear, iterative process. Case studies are used to inform and add to our understanding of people, groups, and society. Surveys, interviews, and classroom observations provided a rich and in-depth study of best teaching practices and student engagement in a blended learning environment.

Within a single, rural elementary school in the Pacific Northwest, 250 students enrolled during the 2013-2014 school year were observed in their respective first- through fifth-grade classrooms. Notices were sent to parents in the participating classrooms. Parental objection to the quantitative data collection would result in exclusion of that classroom in the study. Students were observed to be on-task or not on-task, in 5-minute increments for a total of 30 minutes per classroom. The data were collected in a quantitative data sheet (Appendix Q). There was no personal contact between the students and the researcher, which would have required individual parental consent. Descriptive statistical analysis was employed utilizing IBM SPSS Version 20.0 (IBM SPSS, 2014).

Thirty certificated teachers in the elementary school participated in both a paper pre-survey and an electronic online survey administered using Qualtrics, a web-based survey tool (Qualtrics, 2014). Teachers who volunteered for the surveys taught kindergarten through fifth grade or were certificated full-time specialists. An email notice was sent reminding teachers of the upcoming survey, and then an opportunity was made available for the teaching staff to

participate in both the pre-survey and online survey, utilizing their district-issued laptops. The principal arranged a time for the researcher to attend a morning staff meeting, and teachers were instructed to bring their laptops. Anonymous results were collected both through the paper-and-pencil pre-survey and through the online survey in a one-time submission. Teachers were provided a paper copy of the two-question pre-survey. The pre-survey created a baseline prior to other elements of the study, asking participants, "are you familiar with the term blended learning?" and "are you acquainted with blended learning terminology and models?" The online survey, which included 18 Likert scale and 4 open-ended qualitative questions, queried teachers about blended learning practices, instruction, and tablet experience. The electronic survey questions were modified from a 2013 Pew Research Center study (Purcell, Heaps, Buchanan, & Friedrich, 2013).

Teachers completed the pre-survey on paper, the researcher collected them, and then the online survey was administered. All 30 certificated staff completed the electronic survey and then received a $5.00 coffee gift card as a token of appreciation for completing the survey. Additionally, at the time of the survey administration, volunteer opportunities were made available for interested staff to sign up for both the interview and classroom observations.

In addition to taking the pre-survey and online survey, eight kindergarten through fifth-grade teachers from the school participated in two confidential qualitative interviews conducted by the researcher during the 2013-2014 school year. Two different sets of interview questions were used (see Appendices O and P). Questions about instructional methods with various methods of tablet usage and the impact of professional development were explored through a one-on-one, semi structured format.

Careful planning and development of an interview protocol was completed prior to the interviews with participants (Creswell, 2014; Merriam, 1988; Yin, 2014). Teachers had an opportunity to provide open-ended feedback at the end of each interview. Best practice in interview protocol dictates audio-recording and transcription (Creswell, 2014; Merriam, 1988; Yin, 2014). Creswell (2014) provides a detailed data analysis process to authenticate the accuracy of the data, which was followed by the investigator: audio-taping, transcription, coding, and identifying emergent themes and best practices in blended learning.

**Chapter II**

**Review of the Literature**

**Introduction**

Evidence of the positive instructional benefits of incorporating technology into public

schools in America is bountiful (Bauland, 2012; Christensen et al., 2013; Colandrea, 2012;

Goldstein, 2010; Malone, 2012; Pacansky-Brock, 2013; Pickett, 2012). The literature topics

reviewed in this chapter provide a sharper, more precise perspective of the role of best practices

in teaching in a blended learning environment while also addressing factors of student

engagement. Addressed are brick-and-mortar best practice, tablet integration, blended learning as

a best practice, student engagement, Danielson's theoretical framework, and professional

development.

In 2002, No Child Left Behind (NCLB) legislation changed public policy with both

positive and negative impacts. The primary intent of this legislation was to improve student

achievement (U.S. Department of Education, 2013). The legislators who drafted the 2002 NCLB

recognized the value of computer technology as a tool to improve student achievement and

incorporated required computer technology use in K-12 education (Colandrea, 2012; Richardson,

2010). Technology-integrated twenty-first century classrooms require that teachers adopt new

roles and shift toward critical thinking, collaboration, creativity, and communication (Bauland,

2012; Colandrea, 2012; Pacansky-Brock, 2013; Partnership for 21st Century Skills, 2014a;

Sheninger, 2014; Stover, 2012).

No Child Left Behind high-stakes testing accountability measures can hinder educators'

ability to prepare students to enter higher education and employment where twenty-first century

skills are necessary for success (Serim, 2012; Stover, 2012; Velez, 2012; Zhao, 2009). Federal

and state accountability measures require students to be proficient in concept mastery and lower

level knowledge (Serim, 2012; Velez, 2012; Zhao, 2009). These assessments do not examine

critical thinking skills, problem solving, collaboration, and information and communication

technology (ICT) skills, which are competencies expected at higher education institutions and by

employers. One of the adverse consequences of high-stakes testing has been that teachers have

narrowed their curriculum to teach content rather than higher order thinking, collaboration, and

ICT skills (Kumar, 2014; Serim, 2012; Twining et al., 2013; Velez, 2012; Zhao, 2009). For K-12

education institutions to change the way in which they prepare students for a global world,

schools have to implement a twenty-first century vision, mission, and curriculum (Partnership for

21st Century Skills, 2014b; Serim, 2012; Sheninger, 2014; Stover, 2012; Twining et al., 2013;

Velez, 2012; Zhao, 2009).

**Key Instructional Elements in Brick-and-Mortar Schools**

There are several key elements that are recognized as good pedagogy in brick-and-

mortar schools. Some of these elements include a guaranteed and viable curriculum, a simple,

laser-focus on school competencies, and networked professional learning communities.

Marzano (2003) asserts that the variable most strongly related to student achievement at the

school level is a guaranteed and viable curriculum (GVC). DuFour and Marzano (2011)

describe that "one of the most powerful things a school can do to enhance student achievement

is to guarantee that specific content is taught in specific courses and grade levels" (p. 89). Mike

Schmoker in *Focus* (2011), states that if "three simple elements: a common curriculum, sound

lessons, and authentic literacy" (p. 10-11) were taught consistently and reasonably well, there

would be a profound positive impact on students. The lack of such consistency can be a

common concern among many schools as they make scattered efforts to implement many things (DuFour & Marzano, 2011; Schmoker, 2011).

Experts agree that simplicity is a key element to best teaching practices and student achievement (Collins, 2001; Pfeffer & Sutton, 1999; Schmoker, 2006, 2011). In *Good to Great*, best-selling author Jim Collins (2001) describes the Three Circles of the Hedgehog Concept (see Figure 4) based on the famous essay from Isaiah Berlin (1993), *The Hedgehog and the Fox.*

Figure 4

*Three Circles of the Hedgehog Concept*
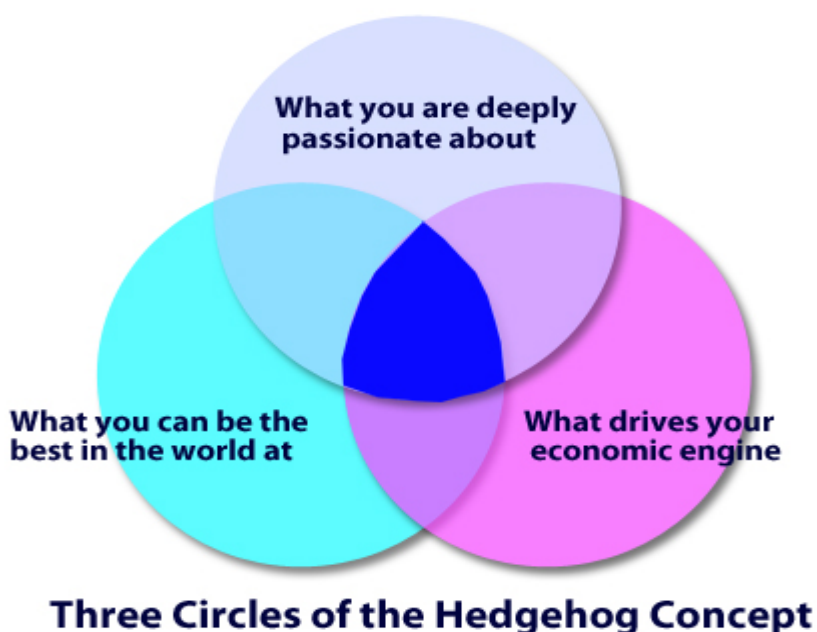


SOURCE: Jim Collins, *Good to Great*, 2001: HarperCollins Publishers, New York, NY. Copyright © 2001.

The concept is that foxes are cunning and pursue worldly, complex ideas; hedgehogs pursue simple, basic principles or concepts to create a unifying vision (Berlin, 1993; Collins,

2001; Schmoker, 2011). One circle probes professionals (for example, teachers) to think about what they are passionate about, and one would hope this includes the passion for students to be engaged and to achieve success in academic achievement and as citizens. The next interlocking circle probes educators about their economic engine. The third interlocking circle asks teachers what they can be the best in the world at. Educators have a responsibility to students to provide not only a free and appropriate public education (FAPE), but to meet Common Core standards, prepare students for twenty-first century careers, and help create an environment in which students are engaged through high quality instruction.

Some models have an arrow that points to the center of the interlocking circle that is labeled as *core competence*. Fullan (2003) says that "just because something is your core business–just because you have been doing it for years or perhaps decades–does not necessarily mean you can be the best in the world at it" (p. 9). Although some may argue that schools are not companies, many would agree that elements that make companies great can apply to schools. In moving schools forward, applying the hedgehog concept of moving a company, or school in this case, towards the goal of student achievement can prove beneficial (Collins, 2001; Schmoker, 2011). Having a precise, refined focus of a shared goal (hedgehog), rather than operating in a scattered, diffused, and inconsistent manner (fox) is more productive (Collins, 2001).

Professional learning communities (PLCs) encompass a large portion of the educational work from Richard DuFour and his collaborators (DuFour, Dufour, & Eaker, 2008; DuFour, DuFour, Eaker, & Many, 2010; DuFour & Marzano, 2011; Easton, 2009). DuFour et al. (2010) suggest PLCs should develop a continual practice of having staff come together to mutually work towards improving student achievement. In *Leaders of Learning*, DuFour and Marzano

(2011) relate that all students should be learning regardless of which teacher they are assigned, and that meeting individualized student needs takes a collaborative effort, which are fundamental ideas in the PLC process. Easton (2009) describes protocols that involve a group of people engaging in a structured process of conversation. They are frequently utilized with teaching staff to facilitate discussions. Demands on teachers are high and time is limited, making the protocol format an effective method to move through assisting teachers with specific students, designing superior lesson plans, reaching agreement, or having an effective discussion on a topic.

**Technology and Tablets**

The inclusion of technology in the classroom is moving forward to include the integration of many devices. One type of device that has become increasingly used is the tablet. Tablet use has led to an increase in mobile learning (Keane, 2012; McKenna, 2012; Miller, Moorefield-Lang, & Meier 2012; Pacansky-Brock, 2013; Sheninger, 2014; Stein & Graham, 2014). Mobile learning refers to education that transpires through the use of handheld mobile devices including smartphones, PCs, iPods, tablets, and other devices (Keane, 2012; McKenna, 2012; Miller, Moorefield-Lang, & Meier 2012; Pacansky-Brock, 2013).

Nationwide, 54% of school districts use tablet computers or e-readers, making tablets the fastest developing school technology tool in the country (DeNisco, 2013). Tablets are being integrated at an increasingly prominent pace into K-12 classrooms and higher education (Johnson, 2012; Miller, Moorefield-Lang, & Meier 2012; Pacansky-Brock, 2013; Pickett, 2012). Piper Jaffrey, an investment firm, found in their survey of 25 technology directors that 100% were testing or deploying tablets in their schools (Gentile, 2012). Further demonstrating the increase of tablet use in the United States and abroad, Cavanaugh and Hargis (2014) reported

that college leaders at the national level, in the United Arab Emirates, provided tablets to select universities in an effort to transform learning.

Bill Gates debuted a Microsoft tablet computer in 2001, using the term *tablet*, although wider use of the term came in 2010 when Steve Jobs of Apple unveiled the first iPad device (McLester, 2012; Miller, Moorefield-Lang, & Meier 2012). Tablets are small, lightweight, handheld, touch screen, Internet-connected devices that allow input on a screen via a stylus or finger as opposed to an external keyboard (Fredette, 2012; Gentile, 2012; McLester, 2012; Miller, Moorefield-Lang, & Meier 2012; Pickett, 2012; Reiss, 2013). Users can manipulate screens through zooming, rotating, pinching, taking and editing photographs, recording and/or playing video, playing music, emailing, messaging, using social media, making presentations, and running apps, all while enjoying the tablet's long battery life (Fredette, 2012; McLester, 2012; Pacansky-Brock, 2013; Pickett, 2012; Rosenzweig, 2013).

Although use of classroom technology, including tablets, is becoming more prevalent, a usage gap still exists between schools. Some analysts say the digital divide gap is wider than ever, although there are active efforts to lessen the divide (Chong, 2012; Reiss 2013). This divide happens because incorporating technology into classrooms is a major financial outlay for school districts (Colandrea, 2012). To diminish the technology gap between lower income and wealthier school districts, a federal program called E-Rate, was established in 1997 (McLester, 2012; U.S. Federal Communications Commission, 1997). Districts can make cost choices to help bridge the gap as well. Tablets are customizable and less expensive than laptops or PCs (Fredette, 2012). Some districts use grants or special funding, or they utilize textbooks in their electronic form (Fredette, 2012).

In an effort to support the transformation of American classrooms to digital learning labs, in 2012 the Federal Communications Commission Chairman and Secretary of Education introduced a five-year challenge and *Digital Textbook Playbook* through the modification of the textbook adoption process (Reiss, 2013). Taxpayer funding for K-12 schools that was once only for traditional textbooks was made available for tablets and other devices (Reiss, 2013). Further interest in digital materials developed in 2012 because of an Apple initiative to cultivate and deliver digital textbooks by teaming with three of the largest textbooks companies: Houghton Mifflin Harcourt, McGraw-Hill, and Pearson (McLester, 2012). Because of such developments, many K-12 districts have considered going digital and getting rid of textbooks completely (Fredette, 2012; Reiss, 2013). Throughout the U.S., schools have been advised to switch to digital instructional materials by 2017, according to the State Educational Technology Directors Association in its report titled, *Out of Print: Reimaging the Textbook in a Digital Age* (Reiss, 2013).

Tablets have been incorporated into many classrooms in K-12 and college learning environments (McKenna, 2012; Pacansky-Brock, 2013). Many opportunities exist to incorporate these tools into classroom instruction. Instructional tools, like tablets, are most effective when utilized by a teacher who has familiarity with and professional development in effective usage and technology integration (Bauland, 2012; Beaudry, 2011, Chong, 2012; Gathany, 2012; Goldstein, 2010; McKenna, 2012; Pass, 2008; Shaw, 2010). Utilizing best teaching practices in combination with using tablets creates a classroom of engaged students who are on-task and ready to learn (Bauland, 2012; Beaudry, 2011, Chong, 2012; Gathany, 2012; Goldstein, 2010; Shaw, 2010).

Numerous tools exist to assist teachers in navigating the massive number of apps in existence for tablets. Apple (http://www.apple.com/) has over 1 million apps for their products. Over 65,000 are educational apps for the iPad, although other tablet manufacturers have invested in Android app development (Fredette, 2012; McLester, 2012). One site, *Educational Technology and Mobile Learning: A Resource of Educational Web Tools and Mobile Apps for Teachers and Educators*, has a drop-down list of apps for teachers (Kharbach, 2013). There are more than two dozen different choices of categories, and each category, such as "Digital Storytelling Apps for iPad," provides several suggested apps for that topic (Kharbach, 2013).

**Blended Learning**

Blended learning instruction provides an opportunity for students to learn in a method that is personalized (Christensen et al., 2013; Horn, 2013; iNACOL, 2013; Malone, 2012; Pointek, 2013b; Watson, Murin, Vashaw, Gemin, & Rapp, 2012; Werth, Werth, & Kellerer, 2013). Blended learning allows for a commanding mixture of real-time interaction based on the school structure and the diverse group of learners (Gathany, 2012; iNACOL, 2013; Pointek, 2013b). In *The Online Learning Definitions Project*, blended learning is defined as:

> Anytime a student learns in part at a supervised brick-and-mortar location away from home and at least in part through online delivery with some element of student control over time, place, path, and/or pace; often used synonymously with Hybrid Learning. (iNACOL, 2011, p. 3)

While online learning is the taxonomy, the focus of this study was brick-and-mortar instructional elements and blended learning (see Figure 5). It may be helpful to those who are new to blended learning to see the overview that this taxonomy demonstrates, as well as subsequent models and terminology.

Figure 5

*Blended Learning in Relation to Other Education Practices*
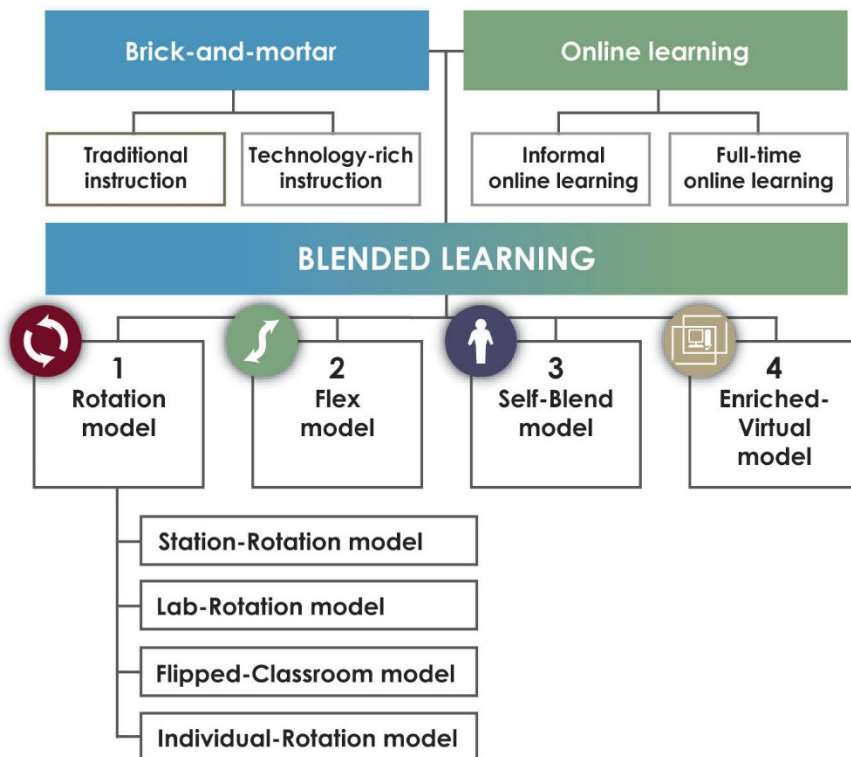


SOURCE: *Clayton Christensen Institute (2012)*

Education, as one of the biggest industries in the world, will be transformed by blended learning (Jensen, 2013; Pickett, 2012; Pointek, 2013b). Futurist Rolf Jensen reports that more than three million college students are accessing digital learning for free through a company called Coursera, which works in cooperation with different universities, and the digital learning trend is predicted to grow (Jensen, 2013; Pointek, 2013b; Stein & Graham, 2014). According to a 2010 report from the National Center for Education Statistics, nearly every U.S. school has at least one instructional computer with Internet access.

There are several different blended learning models; some are hybrids (Christensen et al., 2013; Gradel & Edson, 2011; Pinto & Anderson, 2012; Pointek, 2013b; Roseth, Akcaoglu, & Zellner, 2013). Horn (2013) refers to the station-rotation, lab-rotation, and flipped-classroom models. He argues that elementary schools will be "sustaining innovation" (p. 3) whereas at the high school level, blended learning is likely to replace the traditional classroom (Christensen, Horn, & Staker, 2013). Staker and Horn (2012) of Clayton Christensen Institute (formerly Innosight Institute) developed a preliminary model (see Figure 5) of a blended learning taxonomy based on an examination of curricula. The authors report that their model characterizes certain programs within a school and is not a typology for a school-wide plan, as many schools have a variety of blended learning models for their learners (Horn & Staker, 2012). The research site school in this study primarily uses the rotation model, though it is helpful to gain an overview of blended learning and the models available for implementation and integration into educational systems.

Whatever model they use, schools are implementing blended learning because of the benefits. Research supports the effectiveness of blended learning over traditional brick-and-mortar instruction and digital learning alone (McGee & Reis, 2012; Means, Toyama, Murphy, Bakia, & Jones, 2010; Nagel, 2009; Tao, Fore, & Forbes, 2011; Werth, Werth, & Kellerer, 2013). Werth, Werth, and Kellerer (2013) highlight a joint research study with the Idaho Digital Learning Academy (IDLA) and iNACOL in which K-12 teachers were surveyed who had received professional development from IDLA in blended learning. In the survey results, 87% of teachers found forms of communication between parents and students and themselves to be the same or better after implementing blended learning. With the use of blended learning, more than

80% of teachers reported improvements in self-paced learning and the ability to be innovative and provide assistance to those who are struggling.

 With all the advantages of blended learning, there are also a variety of tools available such as DreamBox Learning (http://www.dreambox.com/). DreamBox Learning, founded in 2006, is a learning platform that utilizes blended learning techniques to reach learners in all 50 states (Pointek, 2013b). Along with DreamBox, there are many other tools to connect students to their learning in ways not possible for students in the past. According to social networking tool Edmodo (2014), over 32 million educators and students across the globe are utilizing its services and other similar platforms. Depicted by Ambient Insight (2011), the growth of digital learning (Figure 6), offers blended learning tools to reach learners across the U.S. and the globe.

Figure 6

*Growth of Digital Learning*
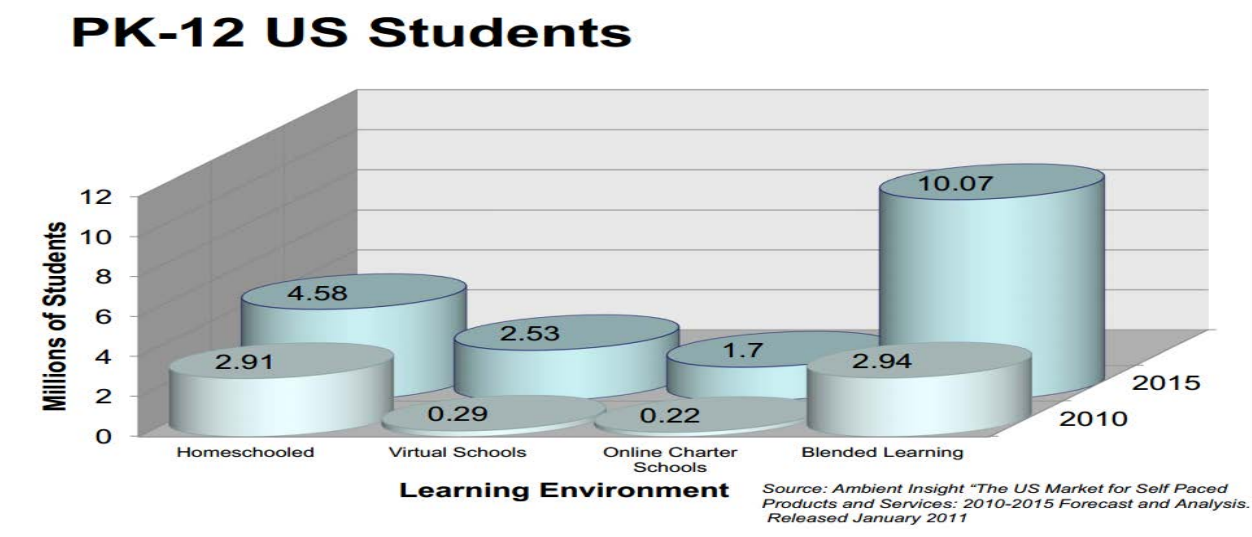


SOURCE: Ambient Insight (2011)

 As educational leaders have become more aware of the effectiveness of blended learning, districts appear to be integrating technology with the Common Core and with assessment practices. For example, according to the State of Washington Office of the Superintendent of

Public Instruction (2013), leaders have created and are piloting a statewide SMARTER Balanced Assessment, the first digital public school exam in the state, as a new way to assess students with the new Common Core State Standards. In addition, educational technology standards have been tied in with the Common Core. This tie-in, called Crosswalk, includes such requirements as interacting and collaborating by using a variety of digital tools (Washington State OSPI, 2013b).

Although not all have welcomed the Common Core and SMARTER assessment adoption as the new teacher evaluation system in Washington, the movement towards incorporating technology into education is clear. This movement highlights the need for teachers to have appropriate professional development to ensure effective test administration. Students need to be comfortable with the computer so that technology is not a barrier to a clear assessment of their knowledge.

The combination of traditional and digital learning together form the powerful blended learning model visible in the Common Core, new assessments, and technology standards required by states. Making a well-planned transition to this blended learning model is essential for success. One process for reaching this goal is through the use of effective instructional exercises developed by Judy Harris and Mark Hofer (2009) based on the technological, pedagogical, and content knowledge (TPACK) model. This process assists teachers in how to teach, select, and use educational technology effectively (Bennett, 2012; Harris & Hofer, 2009; Mishne, 2012; Serim, 2012).

Like the TPACK model, blended learning allows practitioners to meet the diverse needs of students by matching technology, instruction, and content to each student (DreamBox Learning, 2014c; Roseth, Akcaoglu, & Zellner, 2013; Tao, Fore, & Forbes, 2011). Opportunities are available with open-source technologies to incorporate advances and adjust teaching

strategies for the individual needs of students and to maximize their potential (Roseth, Akcaoglu, & Zellner, 2013; Tao, Fore, & Forbes, 2011). For example, Roseth, Akcaoglu, and Zellner (2013) report that WordPress, an open source website publishing application, was utilized in a study at Michigan State University to design a virtual classroom space with mostly free updates, tools, and customization. In the study, Google's suite of applications, which provided free video conferencing for hosting up to 10 people, allowed for collaboration. The researchers argue that working collaboratively in small groups makes learning a more cooperative, effective, and engaging shared experience (Reeves & Reeves, 1997; Tao, Fore, & Forbes, 2011).

While working collaboratively is effective, equally important is the increasingly dominant technology-rich classroom (DreamBox Learning, 2014b; Green & Evans, 2014; Scheninger, 2014). The National Education Technology Plan has been developed to encourage, engage, and endow learning experiences that equip students for a global society (Rosen & Beck-Hill, 2012; U.S. Department of Education, 2010). One example is the Time to Know program, designed for a blended learning environment at the elementary level. In a study of Time to Know, Rosen and Beck-Hill (2012) reported five different program components: infrastructure, interactive yearlong core curriculum, digital teaching platform, pedagogical support, and technical support. In a pre/post assessment, they found that disciplinary concerns declined and unexcused absences decreased by 29.2% during the school year as a result of the program. The authors indicate that teachers implementing the three-tiered model had a differentiated curriculum at their disposal. Their study supports innovative approaches to technology integration in the blended learning environment.

In 2007, Jonathan Bergmann and Aaron Sams, two high school teachers from Colorado, instigated the notion of the flipped classroom, which has been popularized by Salman Khan and the Khan Academy (Curtis, 2013; Flumerfelt & Green, 2013; Pacansky-Brock, 2013). In a flipped classroom, video recordings of lectures are shared with students before class time. Classroom time is freed up to interact when students are face to face and apply the information learned in the videos (Brunsell & Horejsi, 2013; Christensen, Horn, & Staker, 2013; Curtis, 2013; Flumerfelt & Green, 2013; Pacansky-Brock, 2013).

Such blended learning environments fit in with the modern emphasis in education on twenty-first century skills for students (Bauland, 2012; Hoyle & Kutka, 2008; Richardson, 2010; Riddle, 2010; Serim, 2012). There are several organizations, including the International Society for Technology in Education (ISTE) that provide technology standards (see Figure 7).

Figure 7
*National Educational Technology Standards for Teachers (NETS-T), 2008*



SOURCE: International Society for Technology in Education (ISTE)

The ISTE formed the National Educational Technology Standards (NETS) to assist educators in determining the twenty-first century skills that students, teachers, and administrators need to be effective (ISTE, 2008; Serim, 2012). Although there are student and administrator standards, the focus of this research was the 2008 teacher standards (NETS-T) as shown in Figure 7. The NETS-T includes digital age learning, student learning, professional growth, digital citizenship, and digital age work.

These standards exemplify what teachers may be required to demonstrate for evaluative purposes and imply a need for skills training to help teachers deliver appropriate instruction so their students can meet twenty-first century demands (DreamBox Learning, 2014c; Partnership for 21st Century Skills, 2014a; Serim, 2012). Other standards, such as those outlined in Charlotte Danielson's teaching framework, also include several components in which technology is a part (Danielson, 2013).

**Student Engagement**

Student engagement can be challenging to define as it is multidimensional. There are different forms of student engagement: cognitive, academic, social, behavioral, affective, and emotional. Engagement is closely tied to motivation, self-determination, and self-efficacy (Christenson et al., 2008; Christenson, Stout, & Pohl, 2012; Christenson, Reschly, & Wylie, 2013; Finn & Zimmer, 2013; Marzano & Brown, 2009; Raftery, Grolnick, & Flamm, 2013; Reschly & Christenson, 2013; Skinner & Pitzer, 2013).

Fullan (2014) argues:

schools can no longer be a place where information is merely presented; students must be

actively engaged in their own learning–building deep understanding of concepts,

applying different frameworks, analyzing the work of others, finding solutions to real

problems through collaboration, thinking creatively and critically, contributing ideas, and developing products of quality. (p. 155)

Student engagement, in the context of this research is best summarized in Figure 3.

Appleton, Christenson, Kim, and Reschly (2006) and Christenson et al. (2008) developed this model and it is cited in other works in the student engagement field of study (see Appendices I and J). For purposes of this research study, the model guides the literature review of student engagement (Appleton, Christenson, Kim, & Reschly, 2006; Christenson et al., 2008). In this model, observable engagement and internal engagement are divided into four engagement subtypes. The specific aspects of observable engagement that this study explored were on-task and off-task behaviors of students in a rural elementary school.

Figure 3
*Student Engagement*



**Observable Engagement** | **Internal Engagement**

**ACADEMIC**
e.g., time on task, credit accrual, homework completion, engaging in class activities

**COGNITIVE**
e.g., perceived relevance of schoolwork, personal goals and autonomy, value of learning and success in school

**BEHAVIORAL**
e.g., attendance, suspensions, participating in school activities, being on time

**AFFECTIVE**
e.g., identification with school, sense of belonging, school connectedness

(Appleton et al., 2008)

Observable engagement includes two of the four subtypes shown in Figure 3. Those two are academic and behavioral engagement. Academic engagement is demonstrated through student goal-achievement behaviors, such as determining effective tactics for material acquisition, self-monitoring, and persevering through challenges (Schunk & Mullen, 2013).

Danielson (2013) says what students are doing and saying in response to the teacher is the best indicator of student engagement. Educators generally equate on-task behavior with academic engagement as well: effort, hard work, focus, attention, interest, and willing participation (Skinner & Pitzer, 2013) are all examples.

Engagement in school contributes to key educational outcomes (Bempechat & Shernoff, 2013; Christenson et al., 2008; Christenson, Stout, & Pohl, 2012; DreamBox Learning, 2014c; Finn & Zimmer, 2013; Raftery, Grolnick, & Flamm, 2013). Schunk and Mullen (2013) state, "students engaged in learning have a sense of self-efficacy for learning. They hold positive outcome expectations and value the learning" (p. 225). The also stated, "setting goals, evaluating their progress, deciding on effective strategies for learning the material and succeeding, as well as displaying productive achievement behaviors," (p. 225) are examples of educational outcomes with an engaged learner.

Parents can play a key role in their child's academic engagement (Bempechat & Shernoff, 2013; Raftery, Grolnick, & Flamm, 2013). Parents are guides for their children in their school experience, and parents can significantly safeguard or jeopardize the dynamics of low achievement (Bempechat & Shernoff, 2013; Raftery, Grolnick, & Flamm, 2013). Successful educational outcomes can be attributed to the involvement of parents in their children's schooling (Bempechat & Shernoff, 2013; Raftery, Grolnick, & Flamm, 2013).

Behavioral student engagement, another observable engagement subtype (see Figure 3), involves managing student behaviors in the classroom efficiently and proactively, with consistent practices focused on prevention (Pekrun & Linnenbrink-Garcia, 2013; Pianta, Hamre, & Allen, 2013). In a school-wide approach, a strong framework is found in the implementation of a positive behavioral intervention system (PBIS) from work at the University of Oregon. Developers of the methodology and system for the implementation of PBIS include Rob Horner, George Sugai and Jeff Sprague (Horner, Sugai, & Horner, 2000; Sprague & Golly, 2005). A simple effective system of (a) be safe, (b) be respectful and (c) be responsible, can provide clear and simple guidance toward the manner in which all students and staff can expect to be treated and to treat others (Pianta, Hamre, & Allen, 2013; Sprague & Golly, 2005).

Internal engagement has two subtypes in this model: cognitive and affective (see Figure 3). Internal engagement is tougher to observe, though it is critical to student engagement (Christenson, Stout, & Pohl, 2012). Both cognitive and affective engagements are impacted by the complexity of the classroom environment and relational settings (Pianta, Hamre, & Allen, 2013). While teachers implement best teaching practices, students must be working in an environment where they feel safe and where positive behaviors are reinforced (Beaty, 2006; Jones, Dohrn, & Dunn, 2004; Marzano & Brown, 2009; Sprague & Golly, 2005; Voelkl, 2013). Supportive teacher-student relationships and peer-to-peer relationships enhance student engagement and positive outcomes (Pianta, Hamre, & Allen, 2013).

Marzano and Brown (2009) argue that student engagement produces deeper understanding and enhanced levels of achievement. In the book titled, *A Handbook for the Art and Science of Teaching*, five factors relate to student engagement:

- High energy – This is demonstrated by using physical activity, pacing, and enthusiasm to promote engagement and motivation.

- Missing information – Teachers can capitalize on the need for closure by asking students to discover and supply missing information.

- The self-system – Effective engagement involves incorporating topics, ideas, and processes that students find inherently interesting and valuable to them.

- Mild pressure – When students experience mild pressure while engaging in activities such as questioning, games, and competitions, they tend to focus their attention on key elements of the learning process.

- Mild controversy and competition – Teachers can structure and manage nonthreatening forms of controversy and competition through such processes as debates, tournaments, and related forms of team-based activities (Marzano & Brown, 2009, p. 157).

A module and different activities that align with each of the five factors listed above are provided in Marzano and Brown's text.

Praising students is another important part of student engagement that involves providing students with insight, feedback, and encouragement (Dweck, 1999; Horner, & Sugai, 2000; Jones, Dohrn, & Dunn, 2004; Pink, 2009; Sprague & Golly, 2005). Psychologist Carol Dweck suggests that teachers offer specific praise for students, making the praise genuine and providing the praise individually instead of in front of the whole class (Dweck 1999; Pink, 2009). Similarly, strategies to demonstrate caring for students can include showing interest in their life outside of school, welcoming students as they arrive, checking in with students who may be experiencing a tough day, and listening to help students feel valued (Boynton & Boynton, 2005).

There are many hindrances to both observable and internal student engagement. Teachers and staff should be cognizant that whether or not the lesson is engaging is not solely dependent on their teaching skills (Finn & Zimmer, 2013; Marzano & Brown, 2009; Reschly & Christenson, 2013; Schunk & Mullen, 2013; Skinner & Pitzer, 2013). Students are less likely to attend or be on-task when they are dealing with contextual factors such as self-efficacy, family influence, disabilities, language barriers, behavioral challenges, and socioeconomic status. Further, these factors can be compounded by cognitive, social, and affective/emotional engagement. (Bempechat & Shernoff, 2013; Finn & Zimmer, 2013; Reschly & Christenson, 2013; Schunk & Mullen, 2013; Skinner & Pitzer, 2013).

Poor classroom management can also hinder student engagement. Conversely, teaching students an effective discipline system in the classroom is preventative, reducing the need for consequences or punishment. Such an environment can then facilitate student engagement, encourage participation, and diminish the amount of instructional time spend on aversive action (Boynton & Boynton, 2005; Jones, Dohrn, & Dunn, 2004).

Many educators would agree that classroom cultures are a powerful influence on students' relationships and engagement in social development (Pianta, Hamre, & Allen 2013). It is not a surprise that Charlotte Danielson addresses student engagement in her instructional framework for teachers (Danielson, 2013). Student-led discussions and activities increase student engagement (Danielson, 2013). The relationship between teachers and students is critical in the development of higher levels of student engagement (Pianta, Hamre, & Allen, 2013).

**Danielson's Theoretical Framework**

Schachter (2012) notes that the National Council on Teacher Quality (NCTQ) has been watching the number of states mandating the annual evaluation of teachers. When the

2009 Race to the Top federal program had $4.5 billion in funds, teacher evaluation was a part of that program. In regards to Race to the Top, Fullan (2014) says there has been "an explosion in the development of instruments and frameworks for *teacher appraisal*" (p. 30).

Danielson's framework, which lends itself to the teacher evaluation process (see Tables 1-4) has been adopted by Arkansas, Pennsylvania, Wisconsin, Delaware, and some large districts in New York City, Chicago, Houston, and Syracuse (Schachter, 2012). In Washington State, a new teacher and principal evaluation system was implemented and districts could opt to select from one of three theoretical frameworks: (a) Marzano Laboratories' framework, (b) University of Washington's Center for Education Leadership's Five Dimensions of Teaching and Learning, or (c) Charlotte Danielson's work (Association of Washington School Principals, 2013; WA State Teacher/Principal Evaluation Project, 2013d). In Danielson's framework, *The Framework for Teaching, Evaluation Instrument, 2013,* there are 22 components divided into four domains, as demonstrated in Tables 1-4 (Danielson, 2013; Schachter, 2012).

In the first domain (see Table 1) Danielson (2013) has six components of planning and preparation. Danielson describes how the framework is centered on student engagement and defines student engagement as a state in which students are intellectually active. She argues that hands-on activities should cause students' minds to be engaged in the learning activity. Nationally there is a movement to change binary evaluations (satisfactory/unsatisfactory) to a new system of a four-point rubric (see Table 1-4) similar to the instrument Danielson provides (Association of Washington School Principals, 2013). The rubric is the same in all four domains: Level 1 is the lowest (unsatisfactory), Level 2 is basic, Level 3 is proficient, and Level 4 is distinguished (Danielson, 2013).

Table 1

*Danielson Framework for Teaching, Domain 1*

| Domain 1: Planning and Preparation / Rubric |
| --- |
| 1a) Demonstrating Knowledge of Content and Pedagogy |
| 1b) Demonstrating Knowledge of Students |
| 1c) Setting Instructional Outcomes |
| 1d) Demonstrating Knowledge of Resources |
| 1e) Designing Coherent Instruction |
| 1f) Designing Student Assessments |

*Note*. All sections of Domain 1 are evaluated on a 4-level scale where Level 1 is unsatisfactory, Level 2 is basic, Level 3 is proficient, and Level 4 is distinguished.

Though many districts have implemented this type of evaluative framework, which usually replaces a previous binary system of satisfactory/unsatisfactory, there remains debate about the ability to be distinguished in all domains (Association of Washington School Principals, 2013). In the second domain (see Table 2) Danielson (2013) maintains that positive and supportive relationships with students are essential. An environment of respect and rapport are created. The rubric provides both a quantitative and qualitative analysis of the evaluation, offering a more interactive process than a traditional summative-type evaluation. A series of observations occur instead of a once-a-year visit from the principal (Association of Washington School Principals, 2013).

Table 2

*Danielson Framework for Teaching, Domain 2*

| Domain 2: The Classroom Environment / Rubric |
| --- |
| 2a) Creating an Environment of Respect and Rapport |
| 2b) Establishing a Culture for Learning |
| 2c) Managing Classroom Procedures |
| 2d) Managing Student Behavior |
| 2e) Organizing Physical Space |

*Note*. All sections of Domain 1 are evaluated on a 4-level scale where Level 1 is unsatisfactory, Level 2 is basic, Level 3 is proficient, and Level 4 is distinguished.

Table 3

*Danielson Framework for Teaching, Domain 3*

| Domain 3: Instruction |
| --- |
| 3a) Communicating With Students |
| 3b) Using Questioning and Discussion Techniques |
| 3c) Engaging Students in Learning |
| 3d) Using Assessment in Instruction |
| 3e) Demonstrating Flexibility and Responsiveness |

*Note*. All sections of Domain 1 are evaluated on a 4-level scale where Level 1 is unsatisfactory, Level 2 is basic, Level 3 is proficient, and Level 4 is distinguished.

Domain 3 (Table 3) is particularly pertinent to the portion of this study dedicated to student engagement, as this domain encompasses communication, questioning and discussion techniques, student engagement in learning, assessment in instruction, and flexibility and responsiveness. Teachers' use of their own vocabulary and language represents an opportunity to provide modeling for students.

Danielson (2013) says students who engage in questions such as "what if?" demonstrate engagement more so than a classroom of compliant students. Lessons should have a "discernable structure: a beginning, middle and an end, with scaffolding provided by the teacher" (Danielson, 2013, p. 69).

The final domain (see Table 4) is centered on the professional responsibilities of the teacher. Danielson's (2013) outline in this domain encourages teachers to engage in practices that lead to improvements in teaching and learning: continual reflection, instructional analysis, acquisition of skills, and enlistment of support from colleagues, mentors, and supervisors.

Table 4

*Danielson Framework for Teaching, Domain 4*

| Domain 4: Professional Responsibilities |
| --- |
| 4a) Reflecting on Teaching |
| 4b) Maintaining Accurate Records |
| 4c) Communicating With Families |
| 4d) Participating in the Professional Community |
| 4e) Growing and Developing Professionally |

*Note*. All sections of Domain 1 are evaluated on a 4-level scale where Level 1 is unsatisfactory, Level 2 is basic, Level 3 is proficient, and Level 4 is distinguished.

Maintaining a compilation of strategies and reflecting accurately on lessons are important indicators of this fourth domain. This domain also intersects with the topic of professional development in the application of tablet integration into schools. Domain 4 is a core domain for teachers both in their evaluation and professional growth in the field of education. Teachers need to have a comfort level and system of support to enable them to expand, explore, and define their instruction for all of their students.

**Professional Development Related to Blended Learning**

Professional development is included as a component in Danielson's teaching framework, as enhanced teacher learning occurs when the school environment provides support and encouragement of teachers' learning, teachers are engaged in deliberate practice, and opportunities exist to refine and add complexity to their practice (Beaudry, 2011; Chong, 2012; Shaw, 2010). Professional development that assists teachers in overcoming technology barriers, assists teachers with their own learning, includes peer-to-peer professional development, and systemically affects other school practice will be addressed in this section.

The ease of access to technology support, modeling, authentic teaching activities, and collaboration are important factors in professional development (Beaudry, 2011; Chong, 2012; Karl, 2011). In fact, collaboration with other teachers is key to professional growth (Beaudry, 2011; Chong, 2012, Werth, Werth, & Kellerer, 2013). Mireles (2012) infers teachers with higher levels of teaching innovation place greater value on learning from experts outside the network and collaboration at individual schools in transforming their practice.

When technology is instituted, professional development should be provided simultaneously to teachers to help them move forward past barriers (Pass, 2008). Researchers have found that even if educators view changes as advantageous to themselves or others, they

will not take steps en route to change if they view the obstacles as too challenging to overcome (Prochaska & Prochaska, 1999; Werth, Werth, & Kellerer, 2013). Therefore, obstacles that prevent professional development–lack of time, technology access, and administrative support– also prevent full implementation of blended learning techniques (Chong, 2012; Colandrea, 2012; Werth, Werth, & Kellerer, 2013). For example, schools have had difficulty coming up with a tablet plan because the tablet field is moving so quickly (Fredette, 2012).

Oftentimes, district professional development is utilized for curriculum needs, alignment to standards, and assessment. With technology integrated into the standards (Common Core), opportunities for professional development should increase. Instead, many teachers who want to further their technological abilities must do so on their own time.

The need for professional development to address technology integration and innovation is more evident at the elementary school level (Beaudry, 2011; Colandrea, 2012). Beaudry (2011) found that elementary teachers were utilizing technology for direct instruction and test preparation, rather than for professional development needs. Developing innovative teacher education programs helps both teachers and students, as preservice teachers are often early adopters (Chong, 2012; Paganelli, 2010; Twining et al., 2013). However, if information and communication technology has not been made a priority in the preparatory program, it is challenging for preservice teachers to change their mindset (Twining et al., 2013). As teachers become more familiar with technology and use it for their own learning, they can also help students learn to use it more effectively.

Professional development enables teachers to integrate and continue their own professional growth when a continuum of options has been developed. After two years of research from the Education Development Center, Burns (2013) identified what she says are the

top five emerging professional development technologies. Burns, a technology-based teacher training curriculum designer, ranked mobile technologies as the most favorable for personalized teacher professional development. Her research revealed that internationally, teachers receive professional development via their mobile technology devices. The low cost of both smart phones and tablets, as well as the availability of the apps that assist in delivering educational content to teachers, make for robust educational opportunities. An app such as AppMakr, a do-it-yourself app, is utilized by both students and teachers to create their own apps. The other four technologies that Burns identified for professional development include Internet protocol TV (IPTV), immersive environments, video, and social media. Tablets can be used to receive high-definition (HD) digital content and on-demand tailored professional development programming at school or at home. These different technologies in the mobile device category, including the tablet, demonstrate how teachers can access an individualized professional development menu at the location and time of their choice (Burns, 2013).

Not only can professional development help individual teachers, who in turn help their students, but it can help teachers who in turn help each other. Addressing professional development needs for technology use is important in moving everyone forward and utilizing staff members who exhibit attributes of technology trainers (Johnson, 2012). Johnson (2012) says there are seven qualities that make trainers effective at assisting others with technology (p. 196-197):

- Always assuming the problem is on the desk, not in the chair

- Refraining from touching the learner's mouse

- Having the ability to create great analogies

- Providing clear support materials

- Knowing what is essential and what is only confusing

- Assuring learners that "if it breaks, we'll fix it"

- Retaining perspective

If professional development includes such instructions, teachers can help each other and their students more readily implement technology.

Implementation of educational technology in a school environment requires professional development for teachers that augments learners' abilities and combines pioneering methodologies in technology (Rosen & Beck-Hill, 2012; Twining et al., 2013). This kind of comprehensive approach to professional development invites a more systemic form of change (Goldstein, 2010). Betts (1992) says systems are a "set of elements that function as whole to achieve a common purpose" (p. 2). Further, Nichols and Ferrara (2014) argue that systems thinking includes the network of "relationships among objects and activities" (p. 3).

In one example of systemic change, a small rural district in Cashton, Wisconsin, outside consultants are brought in to lead professional development, send teachers to summer workshops, and provide teachers with common planning times to explore ways to implement technology in the classroom (Butler, 2010). The district has a teacher on special assignment (TOSA) to help train other teachers to implement technology into their classrooms (Butler, 2010; Johnson, 2012). The TOSA can help teachers use the interactive boards for math problems, record and create a slide show the teachers can play back in class, or post recorded material on the Internet for parents and children to replay on their own (Butler, 2010). Butler says, "to foster communication, Cashton teachers have been given access to NetVibes, a Web publishing platform that teachers use to write blogs, post classroom assignments and newsletters, share news feeds, and post warm-up exercises" (2010, para. 17). One district supplies teachers with tablets and provides

hands-on orientation sessions so teachers know how to care for the tablets as well as operate them (DeNisco, 2013). That district continues to provide training over the year and eventually moves towards outcome and usage training as teachers quickly adjust to the tablets (DeNisco, 2013).

**Conclusion**

The literature supports blended learning as one viable method of implementing best teaching practices (Christensen, Horn, & Staker, 2013; Horn & Staker, 2011; Means et al., 2010; Nagel, 2009; Pacansky-Brock, 2013; Pointek, 2013b; Werth, Werth, & Kellerer, 2013). Sound pedagogical strategies taught well and with consistency are key to high levels of academic achievement (DuFour & Marzano, 2011; Marzano & Brown, 2009; Schmoker, 2011). This can be applied to brick-and-mortar schools, blended learning, and hybrid learning environments.

Classrooms in the twenty-first century require educators to integrate web-based resources, share among other teachers in virtual environments, and make small steps using sound pedagogical techniques (Bauland, 2012; Karl, 2011). Having access to effective professional development experiences for all stakeholders is not unreasonable for teachers to expect (Jenkins, 2012; Pass, 2008). Further research may assist educators in strategically implementing blended learning at all levels, as it is currently inadequate, especially at the elementary level in brick-and-mortar schools.

The goal of implementing blended learning is to increase student engagement. Student engagement is more than a child's being on-task (Danielson, 2013; Marzano & Brown, 2009). There are many factors that impact student engagement such as attendance, discipline, classroom management or behavioral supports, and connectedness to the teacher and class.

Building an environment for successful blended learning and student engagement requires systems thinking. Systems thinking means building a shared vision, mental models, and team learning, all essential ingredients for the integration of technology and best practices in teaching (Senge, 1990). A systemic orientation is the most coherent way to provide teachers with the professional development they need to engage their students and feel confident in their technology integration (Pink, 2009; Senge, 1990). Systematically rebuilding systems that have failed in schools requires what Collins (2001) calls a Level 5 leader. Such leaders are those with determination and humility who are driven with an unwavering resolve (Collins, 2001). Leaders who challenge conventional methodology can lead to systemic changes in thinking (Collins, 2001; Pink, 2009; Senge, 1990; Sergiovanni, 1992). They are the type of leaders required for the integration of best teaching practices in blended learning.

**Chapter III**

**Design and Methodology**

**Introduction**

The purpose of this study was to investigate best practices in a K-5 blended learning environment and to determine if tablet usage in the classroom increases student engagement factors. As the district in this study and others move toward one-to-one tablet usage, it is important to determine whether student engagement increases with the use of technology devices and which teaching practices are best in a blended learning environment. Identifying professional development needs of teachers in a blended learning environment was also an intentional focus, and qualitative data about this was collected and reported in this study.

This study was conducted in kindergarten through fifth grades using the following data collection methods: pre-survey for certificated teachers, an online certificated teacher survey, interview data with eight certificated teaching staff, and 10 classroom observations in the first through fifth grades. All observations took place in one rural, elementary school in the Pacific Northwest.

This research aimed to answer three primary questions:

1. What methodology supports best practices in a K-5 blended learning environment?

2. How does tablet use impact student engagement?

3. With an increase in the use of tablets in classrooms, what are teacher perceptions of professional development and needs?

A case study design was selected to conduct this research (Merriam, 1988; Creswell, 2007, 2014; Creswell & Plano Clark, 2007; Stake, 1995; Yin, 2014). Case study methodology

was chosen in order to examine and compare different first through fifth-grade classrooms employing one-to-one tablets, two-to-one tablets, and fewer than 10 tablets per classroom.

Qualitative data was collected from two open-ended questions in the teacher pre-survey (see Figure 8), open-ended questions in the online survey, and eight individual interviews. Each interview was conducted twice, with a different set of questions for the second interview (see Appendices O and P), for a total of 16 interviews. Open-ended questions from both the online survey and interviews identified professional development needs and tablet usage and comfort, as well as information for potential direction for technology and instructional leaders in this district.

Figure 8

*Triangulation of Data*
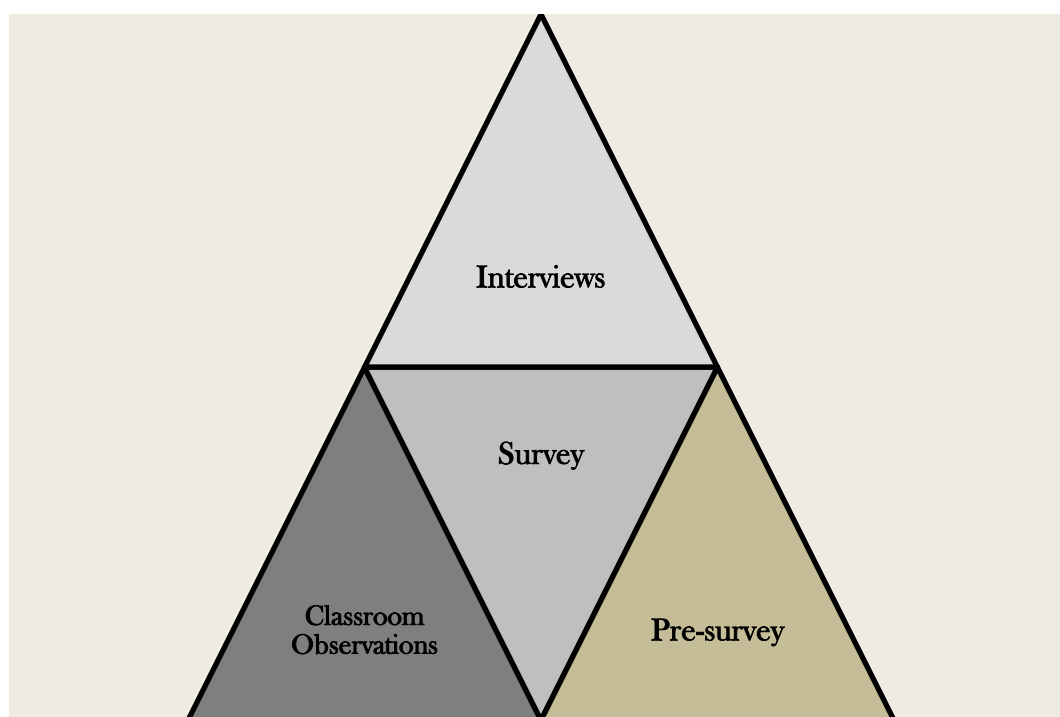


Quantitative data was collected from 30 teachers in a pre-survey, 30 teachers through Likert scale online surveys, and 10 different 30 minute classroom observations in the first through fifth grades. The variety of data collection resulted in a mixed methods approach. Using

more than one source of data, called triangulation (see Figure 8), safeguards rigor in a study (Marshall & Rossman, 2011). Triangulation in qualitative research permits perceptions from various viewpoints (Marshall & Rossman, 2011).

**Research Design**

Prior to beginning the study, sound ethical considerations were given due process. As a veteran school psychologist, the researcher adheres to the American Psychological Association Ethical Principles and Code of Conduct (American Psychological Association, 2013). In addition, an institutional review board reviewed plans for this study (Creswell, 2008; Creswell, 2014; Yin, 2014). Prior to the study, consent was formally sought and permission granted in June, 2013, from the Human Research Review Committee (HRRC) at Northwest Nazarene University (Approval #3062013). Additionally, training was received from the National Institute of Health, and certification was received (see Appendix A). Informed consent was obtained from participants of the online survey, and written consent was received for all interview participants (see Appendix K). Finally, parents and classroom communities were informed of the study before the researcher commenced classroom observations in the fall of 2013 (see Appendix T). Participation was voluntary, and it was made clear that withdrawal from the study was possible at any time.

Both open-ended and close-ended survey questions drawing on multiple sources of data are included in a mixed-method case study research design (Creswell, 2014; Creswell & Plano Clark, 2007; Merriam 1988; Yin, 2014). Table 5 outlines a synopsis of data that was collected as part of this study to answer the research questions.

Table 5

*Synopsis of Data Collection*

| Data Collection | Methods |
| --- | --- |
| Researcher reflective journal, field notes | Qualitative Data |
| Pre-survey for teachers, open-ended questions | Qualitative Data |
| Online teacher survey, open-ended questions | Qualitative Data |
| Interview #1 with elementary teachers | Qualitative Data |
| Interview #2 with elementary teachers | Qualitative Data |
| Pre-survey for teachers | Quantitative Data |
| Likert scale portion of the online teacher surveys | Quantitative Data |
| Classroom observations of on-task student engagement | Quantitative Data |

Qualitative research methods were used to investigate the three research questions in this study (Creswell, 2014; Merriam, 1988; Yin 2014). Several qualitative methods were employed including pre-survey questions, an online survey, and two sets of interviews, all conducted with certificated teachers. Two open-ended pre-survey questions were provided to teachers to explore aspects of blended learning. Measuring teacher professional development needs and attitudes towards technology were explored through open-ended questions in an electronic teacher survey. Finally, two interviews were conducted in classrooms at the site school with each of the eight teacher volunteers, for a total of 16 interviews (see Appendices O and P).

Quantitative research methodology includes instrument-based questions, performance data, and statistical analysis (Creswell, 2014; Creswell & Plano Clark, 2007; Yin 2014). Several

quantitative methods were employed for this study: two pre-survey questions, an online multiple choice survey, and classroom observations. Two blended learning pre-survey questions, in a yes/no format, were asked of all the participants. Quantitative Likert scale results for the online teacher surveys were analyzed with a post hoc test. On-task behavior for first through fifth graders was analyzed through a series of 10 classroom observations. Classroom on-task behavior was quantified in 5-minute increments during 30-minutes of observation by the researcher.

**Participants**

Ethical issues in qualitative, quantitative, and mixed methods require careful consideration (Creswell, 2014; Stake, 2010; Yin, 2014). While there are many ethical considerations, one of the most important is respecting the privacy of participants. This was accomplished through the use of fictitious names (Creswell, 2014; Stake, 2010; Yin, 2014). To maintain anonymity, the rural school located in the Pacific Northwest that participated in this study was assigned the following pseudonym: Olympic Mountain Elementary School.

Olympic Mountain Elementary School was one of four elementary schools in the district with populations of approximately 550 students in each building. Olympic Mountain, a school-wide Title I elementary school, had 570 students. Kindergarten was not included in the classroom observation research. Kindergarten typically has different assessments, part-time attendance, and other factors that make conclusive statements about methods more challenging, although the teachers of this grade level utilized tablets and volunteered to participate in the pre-survey and online survey. This K-5 study included surveying all of the certificated teachers at Olympic Mountain. Olympic Mountain contains two part-time and two full-time kindergarten classes and four classes of each first through fifth grade level.

Demographics are important to contemplate when considering making comparisons of populations in a study. Olympic Mountain Elementary School's race/ethnicity demographics for the district included 80% White students, 10% Hispanic, 3.9% of two or more races, 2.5% Asian/Pacific Islander, 2% Asian, 1.4% Black, 1.2% American Indian/Alaskan Native, and 0.5% Pacific Islander (WA State OSPI, 2013). Olympic Mountain had a very similar demographic makeup as the district for White and Hispanic populations. Olympic Mountain contained 30 teachers with an average of 11.8 years of teaching experience, 66.7% who had at least a master's degree, and 96.2% who met the definition of highly qualified (WA State OSPI, 2013).The entire building supported a total of 570 students.

Olympic Elementary was designated as a Title I school based on the federal definition from the Elementary and Secondary Education Act (ESEA). Financial assistance was provided by the U.S. Department of Education to states and school districts who met the needs of educationally at-risk students (U.S. Department of Education, 2013). Goals of Title I funding are to provide additional instructional services and provide support to students identified as failing or most in jeopardy of failing state performance standards in reading, writing, and math (U.S. Department of Education, 2013).

In July 2012, Washington State, like several states, was granted a waiver of the ESEA requirements (Washington State OSPI, 2013c). There are four designations under the waiver: reward, priority, focus, and emerging schools. Reward schools are defined as Title I highest performing or high progress schools that have met adequate yearly progress in both reading and math for three years (Washington State OSPI, 2013a). Olympic Mountain Elementary School was recognized for meeting those criteria in 2012 (Washington State OSPI, 2013a).

**Data Collection**

Case study research is a thought-provoking methodology and requires arduous work (Creswell, 2008 & 2014; Merriam 1988; Yin, 2014). In this study, multiple methods were used in gathering data (see Table 5). By studying the tablet usage and professional development needs in one building, in depth, the researcher employed a case study design to collect data. Creswell (2014) recommends "incorporating validity strategies" into the study (p. 201).

Triangulation (see Figure 8) was successfully achieved in this study, as multiple methods of data collection were employed from numerous viewpoints (Marshall & Rossman, 2011). Data collection for this study occurred from September 2013 to December 2013.

The researcher employed reciprocity by offering $5.00 gift cards for survey participation. Informed consent was sought from survey participants and written informed consent obtained for the interviews (see Appendix K). A synopsis of the participants is displayed in Table 6.

Table 6
*Participant Synopsis*

| Age Group | % Per Age Range | Years of Teaching Experience | % of Participants' Teaching Experience |
|---|---|---|---|
| 20-29 years old | 10% | <2 years | 3% |
| 30-39 years old | 30% | 3-5 years | 17% |
| 40-49 years old | 30% | 6-10 years | 20% |
| 50-59 years old | 23% | 11-15 years | 10% |
| 60-69 years old | 7% | 16 years or more | 50% |

Respecting the site during observations, data collection, and interviews is important to minimize disruption (Creswell, 2014; Marshall & Rossman, 2011; Yin, 2014). No deception was involved in this study. The investigator neither supervised nor was employed at the site, school, or district, avoiding power imbalances (Creswell, 2014; Yin, 2014).

Participation was voluntary and participants were able to withdraw at any time. No minors or vulnerable participants were included in the survey or interview portions. Gender was removed from the demographic information prior to administration of the survey. This modification provided further protection of the participants due to the low number of males in the site building.

Privacy was maintained through the use of pseudonyms, and anonymity was protected through coding of all data collection documents, storing and maintaining records through locked file cabinets, and password protecting computer equipment (Creswell, 2014; Marshall & Rossman, 2011; Yin, 2014). Data from this study will be stored for three years and then destroyed in adherence to the Federalwide Assurance Code 45 CFR 46.117 (Federalwide Assurance Code, 2014).

**Pre-survey and online survey.** The use of a pre-survey was employed to determine the extent to which staff were familiar with the term blended learning and whether teachers were knowledgeable about terminology and models associated with blended learning. This was assessed through a two-question pre-survey using paper and pencil. Upon completion of the pre-survey, certificated teachers were directed to work on the online survey.

In 2013, the Pew Research Center developed a study titled, *How Teachers Are Using Technology At Home and In Their Classroom* (Purcell, et al., 2013). The study at the Pew Research Center included a questionnaire that was utilized with permission and modified to

better meet the needs of this current study (Appendix C). Instrumentation of the survey is an important component of research (Creswell, 2014; Yin, 2014). Modifications to the original survey required the researcher to employ techniques to establish validity and reliability (Creswell, 2014; Marshall & Rossman, 2011; Yin, 2014).

Modifications were made to establish content validity with the continuous Likert scale survey tool. Conceptualization and analysis in the field of blended learning was initiated prior to the Pew Research Likert scale modifications (Polit & Beck, 2006; Trochim, 2006). Polit and Beck (2006) define content validity as "the degree to which a sample of items, taken together, constitute an adequate operational definition of a construct" (p. 490). Content validity in the online teacher survey was established through the validation process (Creswell, 2014; Marshall & Rossman, 2011; Polit & Beck, 2006; Yin, 2014).

The application of the content validity index (CVI) was employed (Lynn, 1986; Polit & Beck, 2006). To establish CVI, eight professionals in the field of technology education appraised each survey item via a 4-point Likert scale, with a score of 3 or 4 as indicative of the professionals' validation of the item (Davis, 1992; Polit & Beck, 2006). Agreement of no less than 78% from the experts was endorsed as acceptable (Lynn, 1986). Items were eliminated or changed from the professionals' appraisals, and the CVI results yielded no less than 83% agreement in this study.

Internal consistency reliability is the degree to which the Likert items in the instrument are consistent among themselves and with the overall tool (Croasmun & Ostrom, 2011). Cronbach's alpha coefficient was used inclusively in the instrument (Croasmun & Ostrom, 2011; Gliem & Gliem, 2003). This was effectively accomplished by summing the scales for data analysis in each section and for the overall instrument. Cronbach's alpha does not offer

reliability estimates for single Likert items. The investigator implemented the methodology

mentioned above to investigating the reliability of the Likert scale on the tabulated survey

outcomes (Gliem & Gliem, 2003).

Informed consent was obtained prior to the administration of the survey in September

2013, (see Appendix K). The survey tool was designed to determine benefits of a blended

learning environment, measure teacher comfort with tablets as a tool, discover which best

teaching practices were incorporated in classrooms, and identify professional development

needs.

The online teacher survey was administered electronically via email to participants at

Olympic Mountain Elementary School. Study participants opened the link sent to their building

principal who placed the link in a file for the teachers to access the morning of the September

2013 staff meeting. Opportunity to complete both the pre-survey and online survey was given

during the staff meeting. The researcher attended the meeting and provided both written and

verbal instructions to participants during the administration of the pre-survey via paper and

pencil (see Appendix M), then participants immediately completed the teacher survey through

Qualtrics (see Appendix N). Participation was voluntary, and participants provided informed

consent by completing the survey (see Appendix K). The entire intended population completed

both the pre-survey and online survey. Each participant was given a $5.00 coffee cards upon

completion of both the pre-survey and the online survey. Additionally, participants were

provided sign-up sheets to indicate their interest in the interview and classroom observations.

**Teacher interviews.** The interview questions were piloted with four teachers who were

not associated with the building or district where the research was conducted. The piloting

process is important in refining the interview tools, predicting any inquiries that may arise from

the instrument, and to fortify the research (Marshall & Rossman, 2011). The four educators who participated in the interview pilot were actively employed in public schools. One was a special educator with a degree in technology. A second member of the piloting group was responsible for special program director duties in a small school and was required to utilize technology in the classroom, customizing it to meet the needs of the students she serves on a daily basis. A third member was a general education teacher with elementary and middle school experience in technology. Finally, a general education elementary teacher with a technology degree participated in piloting the interview questions.

The final interview questions were altered to incorporate the changes suggested by the results of the pilot. A few redundant questions were eliminated, wording was changed to better reflect technology terminology, and the decision was made to add a short definition of blended learning prior to the question about the use of blended learning in the classroom.

Marshall and Rossman (2011) assert that skillful interviewers ask follow-up queries. The interview questions were divided into two parts: questions for interview one, and then questions for follow-up based on information gathered in interview one (see Appendices O and P). Exceptional listening abilities are needed for interviews, which the researcher attained through work as both a school counselor and school psychologist (Marshall & Rossman, 2011).

Participants in the interview component were K-5 teachers from Olympic Mountain Elementary School. All interviews were conducted on the school campus during school hours of operation, either in classrooms or a designated school conference room. There were eight volunteer interview participants interviewed twice with a different set of questions. A total of 16 face-to-face, audio-recorded interviews were conducted (see Appendices O and P). The researcher utilized Audacity (2014), a free, cross-platform sound editor, which was downloaded

onto a laptop, for interviews. The researcher also transcribed the interviews and developed codes

and themes (Marshall & Rossman, 2011). No translating was required in this study.

Teachers had two methods to share their interest in volunteering for the interview portion

of this study. Teachers could provide their contact information at the end of the Qualtrics survey

indicating they were interested in volunteering (Appendix N), and they also had an opportunity

to write their contact information on a sign-up with the researcher after the electronic survey was

conducted at the site. Nine participants volunteered, though eight were selected based on their

extensive digital technology experience relative to the other participants within the building.

Interviewees provided written informed consent and were allowed to choose to exit the interview

at any time. Participants were given the choice to abstain from answering any questions that they

felt uncomfortable answering (see Appendix K). Interview participants were provided an

opportunity to review the transcript upon completion of the second interview. Participants were

provided with a debrief statement (see Appendix R) and the researcher conducted member

checks (see Appendix U).

**Classroom observations.** Student engagement factors were measured through a

compilation of on-task classroom behavior, attendance, and disciplinary referrals data. Shapiro

(1987) states, "More than any other method of behavioral assessment, systematic direct

observation represents the most direct and desired approach to data collection" (p. 651). On-task

behavior was measured through what is known as a time-sampling method (Beaty, 2006; Hintze

& Shapiro, 1995). Beaty (2006) describes time sampling as controlled, objective, and providing

results that can be utilized for statistical analysis. Quantitative data was collected through the

tallying of student on-task behavior observations conducted in the time-sampling format. For

other types of research or behavior modification, different factors such as antecedent behavior

and functionality would be of importance. However, for the purposes of this research, the investigation involved whether students were actively engaged in the material.

On September 23, 2013, the researcher piloted the classroom observation on-task time-sampling form (Appendix Q). Two teachers with one-to-one tablets in the elementary site school were the most experienced with tablets, had provided professional development district-wide, and had multiple years of successful teaching experience. The pilot utilized these two individuals with strong teaching experience and strong tablet integration expertise. Arrangements were made to visit the first-grade teacher's classroom for a "tech buddy" instructional time. The researcher was introduced to the class as a visitor, and students were told to continue with their regular instruction. There were 23 first-grade students present. The teacher prepared the students for the arrival of their tech buddies to explore a new app on their tablets. The app, called Word Photo, was going to be accessed by the pairs. Twenty-four fifth-grade students arrived with their teacher to join their first-grade buddies. One student was absent, so a different pairing accommodation was made. The 47 students partnered up accessing the Word Photo app on the first graders' tablets. The fifth-grade older buddy was to take a picture using the app and then created a collage of common character traits. The fifth grader had a sheet with common character traits and assisted the first grader in choosing words they believed best described him or her. The fifth grader assisted through the lesson, which was completed in about 15 minutes. Alterations were made to the time-sampling student engagement form based on the pilot observation to include the subject of the lesson being taught, the number of tablets employed during the lesson, and the development of a teacher coding system in order to protect the identity of the teacher (Appendix Q).

Each classroom observation was conducted towards the beginning of the school day. The researcher attempted to observe during the morning time frame so fewer variables, such as subject matter, would be a factor for on-task or off-task behaviors. However, teachers had the choice of when the observations were to take place. Students were tallied as either on-task or not on-task every 5 minutes for a total of 30 minutes.

Drawing upon the work of Shapiro (1987), Hintze and Shapiro (1995), and Beaty (2006), timed observations were conducted on a time-sampling sheet developed by the researcher (Appendix Q). The tool was designed by the researcher in a simple time-sampling format which allowed tallies to indicate the number of student's on-task within the 30-minute observation period. Data points were arranged in 5-minute intervals. The tool was selected to demonstrate the quantitative data in easily identifiable terms and with a common understanding relevant to student engagement. This method provided a high degree of validity and reliability in each time sampling. The researcher was not employed by the school. Researcher bias was a limited factor in this measurement. Children of the researcher attend school in the district, though not in the building where this study was conducted. There were no irregularities or special conditions such as state testing or district testing during the duration of the observations.

A matrix of Olympic Mountain Elementary School was developed to demonstrate visually the various methods of tablet usage across and within the varying grade levels (Table 7). Two classrooms had the highest concentration of tablets: one first-grade and one fifth-grade classroom with one-to-one tablets (one student per tablet). There were several classrooms with two-to-one (two students per tablet), and those with fewer than 10 tablets per classroom. There were also two special education teachers who taught at multiple grade levels and are not shown on the table, one of whom has one-to-one tablets.

Table 7

*Olympic Mountain Elementary School Tablet Configuration*

| Grade Level | Tablet Method | Student/Teacher Ratio |
|---|---|---|
| Kindergarten | <10 tablets (part time) | 25/1 |
| Kindergarten | <10 tablets (part time) | 24/1 |
| Kindergarten | <10 tablets (full time) | 21/1 |
| Kindergarten | <10 tablets (full time) | 21/1 |
| First grade | <10 tablets | 25/1 |
| First grade | 2 students per tablet | 25/1 |
| First grade | <10 tablets | 25/1 |
| First grade | 1 student per tablet | 25/1 |
| Second grade | <10 tablets | 26/1 |
| Second grade | <10 tablets | 25/1 |
| Second grade | <10 tablets | 22/1 |
| Second grade | <10 tablets | 26/1 |
| Third grade | 2 students per tablet | 23/1 |
| Third grade | <10 tablets | 22/1 |
| Third grade | <10 tablets | 23/1 |
| Third grade | <10 tablets | 23/1 |
| Fourth grade | 2 students per tablet | 25/1 |
| Fourth grade | <10 tablets | 24/1 |
| Fourth grade | <10 tablets | 24/1 |
| Fourth grade | <10 tablets | 24/1 |
| Fifth grade | <10 tablets | 24/1 |
| Fifth grade | <10 tablets | 23/1 |
| Fifth grade | 2 students per tablet | 23/1 |
| Fifth grade | 1 student per tablet | 24/1 |

Olympic Mountain Elementary staff often borrowed the number of tablets needed to make a class set depending on how many they already had in their room.

**Analytical Methods**

IBM SPSS Statistical Software Version 20.0 (IBM SPSS, 2014) was used for data analysis. Research-based procedures were identified and employed to analyze data. In addition, descriptive statistics were employed to identify features of the data sets (Tanner, 2012). Graphs and figures describe the data in detail. Cronbach's alpha coefficient was inclusively used with the survey instrument (Croasmun & Ostrom, 2011; Gliem & Gliem, 2003). This was effectively accomplished by summing the scales for data analysis in each section and for the overall instrument. Cronbach's alpha does not offer reliability estimates for single Likert items, so the investigator implemented the methodology described in the data collection section to institute the reliability of the Likert scale on the tabulated survey outcomes (Gliem & Gliem, 2003). The Pearson Product Moment Correlation was the statistical test conducted (Tanner, 2012).

Case studies allow for diversity in the researcher's approach to data collection (Creswell, 2014; Merriam, 2002; Stake, 1995; Yin, 2014). The case in this study was one rural elementary school. Drawing on a mixed methods approach provided a variety of methods to answer the research questions in this study. These included: a pre-survey, Likert scale online survey, classroom observations, and interviews, all conducted face-to-face, for a purposeful research project (See Table 7).

Yin (2014) asserts that the interview is one of the most valuable methods of data collection in a case study. A total of 16 interviews were conducted, two with each of the eight teachers who participated in the qualitative portion of this study. Field notes, observations, and

other anecdotal information were collected during the interviews (Creswell, 2014; Marshall & Rossman, 2011; Merriam, 1988; Yin, 2014).

As interviews are subjective in nature, the researcher diminished bias by being as impartial and nonjudgmental as possible (Merriam, 1988). Fieldwork was conducted using the highest ethical and moral standards (Fullan, 2003; Kidder, 2009; Wagner & Simpson, 2009) and evidence was analyzed in consideration of construct validity (Creswell, 2014, Marshall & Rossman, 2011; Merriam, 1988; Yin, 2014).

Permission was secured for the research site (see Appendix B). Approval of an institutional review board, Human Rights Research Committee at Northwest Nazarene University, granted the researcher permission to begin the study in June of 2013. Informed consent was obtained (see Appendix K) and an interview protocol was developed (see Appendices O and P) as recommended by Creswell (2014) Marshall and Rossman (2011), and Yin (2014).

Hand coding was performed by the researcher in order to maintain high levels of quality after themes and descriptions were developed from the compilation of data. Coding consisted of segmenting chunks and developing categories, then labeling with terms called *in vivo* terms (Creswell, 2014). A Microsoft Excel spreadsheet was created to compile coding and develop field notes into themes. Transcription was completed by the researcher for quality assurance and accuracy after reading through the collection of data. Lincoln and Guba (1985) suggest analyzing the data involves thinking about what was learned from the findings. Qualitative validity and reliability were employed throughout the data analysis process (Creswell, 2014; Lincoln & Guba, 1985; Marshall & Rossman, 2011; Merriam, 1988; Yin, 2014).

Validity strategies included examining different sources of data (triangulation), conducting member checking through follow-up with participants to gain both perspective and perform validity checks, and taking into consideration sources of bias from the researcher (Creswell, 2014; Yin, 2014). Final strategies employed included the consideration of information not consistent with the themes and peer debriefing (Creswell, 2014).

**Limitations**

Yin (2014) says concerns about case study research involve rigor, generalizability, the time it takes, quantity of data collected, and questions about advantages over other methods of research. Results in this study are limited to one elementary building where the research was conducted and may not be representative of urban areas, lower socioeconomic schools, and schools with higher ethnic diversifications.

Mixed methods research strengthens the study and is a stronger methodology than qualitative or quantitative methods alone (Creswell, 2014; Yin, 2014). One limitation of the mixed methods approach is that the researcher must collect a large amount of data to properly conduct the study (Creswell, 2014; Yin 2014). Both a team of researchers and a larger sample size would yield a wider applicability. Further research could focus more attention on discovering the amount of time students need to spend with tablet technology for the technology to impact achievement.

**Chapter IV**

**Results**

**Introduction**

The contribution from this study is important as rural, elementary-level blended learning research is limited while high school and college age groups are more widely investigated (Simon, Nemeth, & McManis, 2013). Making effective choices about pedagogy and how to best utilize technology devices is critical; this research reflects how professional development would enable a systems approach in making those effective choices (Pointek, 2013a; Roth, 2012; Simon, Nemeth, & McManis, 2013; Thiele, 2013). Results reported in this chapter will demonstrate that in this case study, blended learning terminology and models were unfamiliar to rural elementary staff.

The effort to discover how to engage K-5 students by utilizing the best teaching practices in blended learning led to these three primary research questions:

1. What tablet methodology supports best practice in a K-5 blended learning environment?

2. How does tablet use impact student engagement?

3. With an increase in the use of tablets in classrooms, what are teacher perceptions of professional development and needs?

Mixed methods data collection incorporating both quantitative and qualitative methods proved an effective strategy to achieve triangulation, as shown in Figure 9 (Creswell, 2014; Merriam, 2002; Yin, 2014).

Figure 9

*Triangulation of Data*
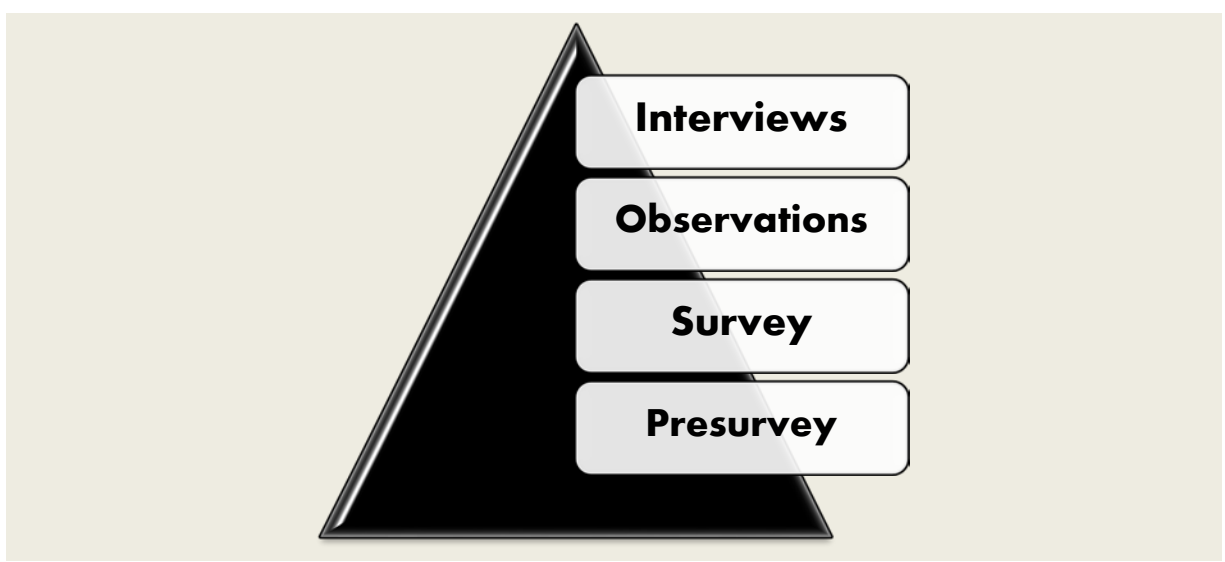


The next two sections explain the quantitative and qualitative results from this case study. An overview of the methodology is shown in Figure 10.

Figure 10

*Overview of Quantitative and Qualitative Methodology*
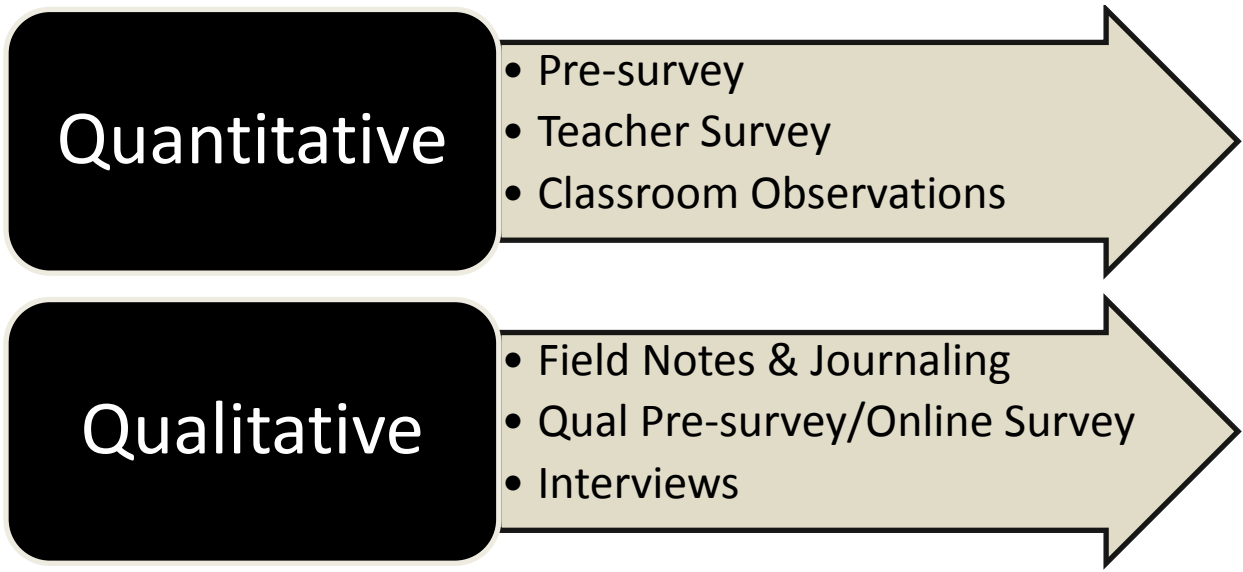
**Quantitative Results**

Quantitative results were derived from the pre-survey with teachers, the online teacher survey, and classroom observations.

**Pre-survey results.** A paper-and-pencil pre-survey was administered to the elementary teachers in the rural district participating in this study prior to the administration of an online survey. Because all 30 teachers who had full-time certificated teaching assignments at Olympic Mountain Elementary School took the pre-survey, participation was 100%. The two questions on the pre-survey were: (a) Are you familiar with the term blended learning (See Figure 11)? (b) Are you acquainted with blended learning terminology and models (see Figure 12)? The impetus for these questions was that blended learning as a best pedagogical practice is not widely known in the public school elementary setting.

Figure 11

*Pre-survey, Question 1 Results*
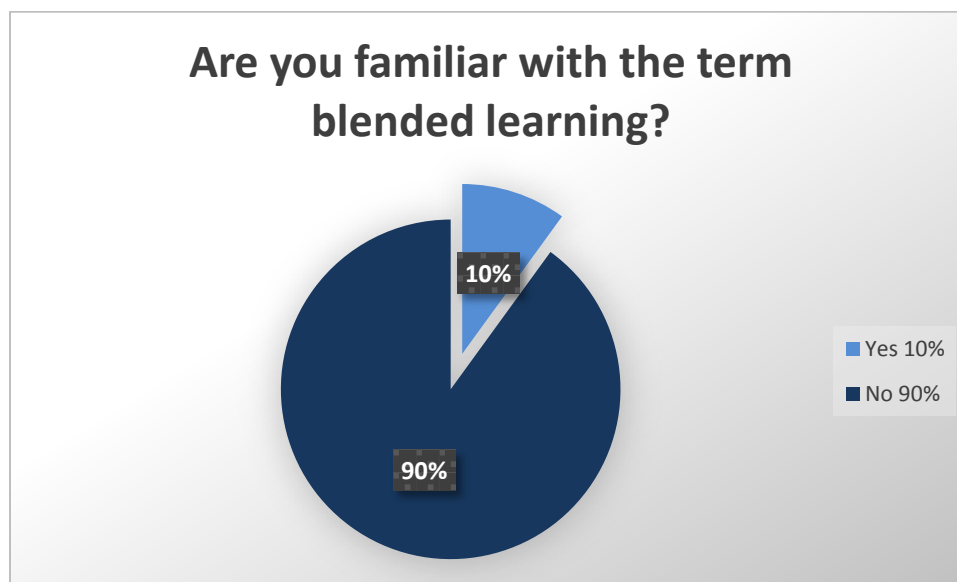
The researcher asked these questions in a pre-survey because teachers might derive some familiarity with blended learning and terminology while completing the online survey. Three teachers answered "yes" to question 1, indicating they were familiar with blended learning, while 27 participants answered "no" (see Figure 11).

The answer to the second question was a resounding no: none of the 30 participants were familiar with terminology typically associated with blended learning or models (see Figure 12). Several participants, however, wrote a few statements regarding blended learning. Those responses are reported within the qualitative section of the results. The figure below demonstrates the data for question 2 of the pre-survey.

Figure 12

*Pre-survey, Question 2 Results*
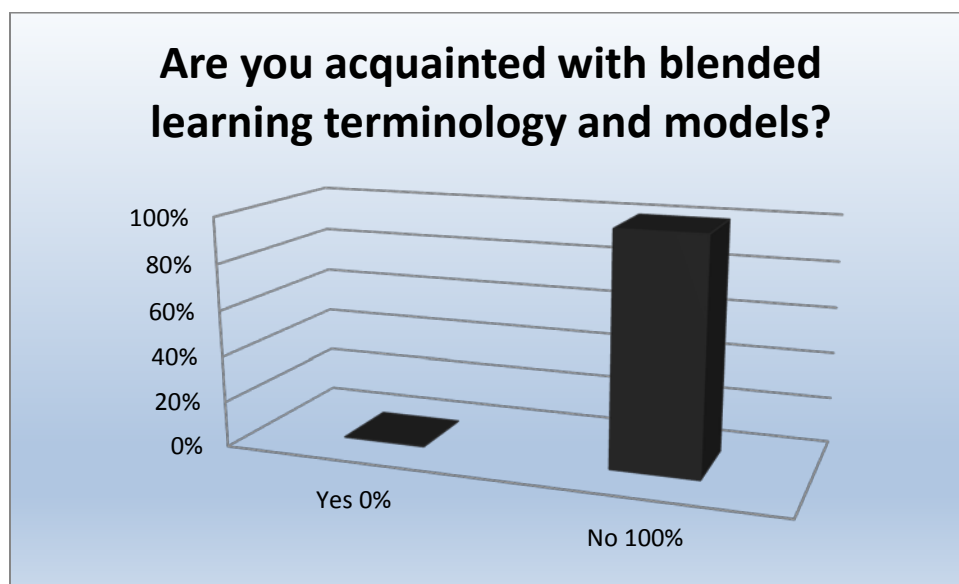


**Online teacher survey results.** The online survey was designed to determine the professional development needs of elementary staff in the area of blended learning and for teachers to rate how effective they viewed tablet usage to be in their instructional practices. There were 19 Likert scale questions in the online survey with the following options:

1- Strongly Disagree

2- Disagree

3- Neutral

4- Agree

5- Strongly Agree

Questions 1 and 2 were both demographic questions, and questions 9 and 11 were open-ended questions. These were excluded from the statistical analysis, but include in the findings. The remaining 15 questions were all analyzed statistically. A copy of the survey is provided in Appendix N.

Polit and Beck (2006) indicate the Content Validity Index or CVI, measures the degree that instrument items are relevant to the content area. More specifically, the researcher engaged in a process which scrutinized specific survey items, termed the Item Content Validity Index (I-CVI) before distributing the electronic survey to technology education professionals to appraise (Polit & Beck, 2006; Trochim, 2006).

Content validity process results are reported in Table 8 (Polit & Beck, 2006; Trochim, 2006). Through the validation process, items were eliminated or altered based on the professionals' appraisals (Creswell, 2014; David, 1992; Marshall & Rossman, 2011; Polit & Beck, 2006; Yin, 2014). Lynn (1986) considers agreement of 78% or better from the professionals' endorsement to indicate validity; results from the CVI in this study were no less than 83% agreement. Table 8 displays the 4-point scale continuum as rated by the expert's validation of the individual survey items.

Table 8

*Content Validity Index (CVI)*

| Question | Very Relevant 4 | Quite Relevant 3 | Sum of Columns 3 & 4 | Somewhat Relevant 2 | Not Relevant 1 |
|---|---|---|---|---|---|
| Q1 | 83% | 17% | 100% | 0% | 0% |
| Q2 | 83% | 17% | 100% | 0% | 0% |
| Q3 | 50% | 33% | 83% | 17% | 0% |
| Q4 | 83% | 0% | 83% | 17% | 0% |
| Q5 | 83% | 17% | 100% | 0% | 0% |
| Q6 | 33% | 50% | 83% | 17% | 0% |
| Q7 | 50% | 50% | 100% | 0% | 0% |
| Q8 | 50% | 50% | 100% | 0% | 0% |
| Q9 | 50% | 50% | 100% | 0% | 0% |
| Q10 | 83% | 17% | 100% | 0% | 0% |
| Q11 | 50% | 50% | 100% | 0% | 0% |
| Q12 | 50% | 50% | 100% | 0% | 0% |
| Q13 | 67% | 33% | 100% | 0% | 0% |
| Q14 | 67% | 17% | 83% | 17% | 0% |
| Q15 | 67% | 17% | 83% | 17% | 0% |
| Q16 | 67% | 17% | 83% | 0% | 17% |
| Q17 | 50% | 50% | 100% | 0% | 0% |
| Q18 | 67% | 33% | 100% | 0% | 0% |
| Q19 | 50% | 50% | 100% | 0% | 0% |

| | | | | | |
|---|---|---|---|---|---|
| Q20 | 83% | 17% | 100% | 0% | 0% |
| Q21 | 67% | 33% | 100% | 0% | 0% |
| Q22 | 100% | 0% | 100% | 0% | 0% |
| Q23 | 100% | 0% | 100% | 0% | 0% |
| Q24 | 100% | 0% | 100% | 0% | 0% |
| Q25 | 100% | 0% | 100% | 0% | 0% |

Cronbach's alpha was employed for reliability. Tavakol and Dennick (2011) state that Cronbach's alpha provides "a measure of the internal consistency of a test or scale; it is expressed as a number between 0 and 1. There are different reports about the acceptable values of alpha, ranging from 0.70 to 0.95" (p. 53). A higher alpha, near 0.90 would be considered excellent, and anything closer to 0.5 or close to zero should be discarded (Tanner, 2012; Tavakol & Dennick, 2011). The survey results of this study were calculated to be .783, which would be considered "good" for internal consistency.

**Classroom observation results.** Teachers were responsible to load and keep their tablets updated for their classrooms. Each teacher had apps that worked best for his or her classroom, depending on the teacher's experience, grade levels of the students, students' preference, and other factors. Most teachers had their tablets set up in a folder system for students to find their work and locate apps. Almost every teacher employed Dropbox or Showbie for students to submit work. Most teachers had district-wide math assessments such as IXL and Accelerated Reader for reading tests.

Some schools utilize a tablet cart, a rolling cart containing a classroom set of tablets or other electronic devices for a teacher to utilize during a specific lesson with the intention of

having one tablet per student (Bauland, 2012). The school in this study avoided the cart method for two reasons. First, teachers found that the maintenance of the tablet cart was challenging, and second, too much prep time was required prior to lessons to ensure that all tablets had the same apps loaded with the same version and updates. Their experience with mobile carts and laptops helped the school collectively eliminate the cart as an option.

The classroom observation results were entered into an Excel spreadsheet with each classroom numbered 1-10 and each 5-minute increment numbered 1-6 (totaling 30 minutes). Data included the number of students on-task, the percentage of students on-task, the number of students off-task, the percentage of students off-task, and finally the tablet method for each class. The highest percentage of student's on-task was 100%, or 26 out of 26 students, during a 5-minute time sampling. Percentages were employed to eliminate class-size as a factor, as two of the eight classes had smaller numbers of students. One was a special education classroom, and one class had a smaller Title I reading group.

The class with the greatest number of student's off-task was the class with fewer than 10 tablets. This class had the lowest on-task rate of 83%. Its highest on-task rate was 92% during the 30-minute observation period. The classes with the highest on-task rates were the two classrooms with one-to-one tablets. Both had 100% on-task rates for each 5-minute increment and for the whole 30-minute observation period. The four classrooms with two-to-one tablets had the next highest on-task rate with only one 5-minute increment showing a 96% on-task rate because one student was off-task. All other time sampling for the two-to-one classes reflected a 100% on-task rate. The data also showed that the highest on-task rates were in classrooms where the teachers had the most experience or familiarity with tablets compared to other teachers in the building, although they had similar or less teaching experience.

A one-way ANOVA was utilized to determine if differences were present amongst at least three groups (MacFarland, 2014; McHugh, 2011). After the chi-squared test, a one-way ANOVA was conducted to evaluate between groups and within groups. This additional analysis was performed to analyze the data in several different ways. There were three different groupings for analysis of the tablet usage: (a) classes with one-to-one tablets, (b) classes with two-to-one tablets, compared to (c) classes with fewer than 10 tablets (see Table 9). An ANOVA compares several groups, then with a single test, their statistical implication can be calculated (Tanner, 2012). Statistical tests were conducted at $p = .05$, a 95% confidence interval. A post hoc test was also performed. A post hoc test, according to Tanner (2012), is "performed after the ANOVA, after a significant $F$" (p. 189). There are two degrees of freedom (df) in calculating the value of $F$. A post hoc test, the Bonferroni, was selected by the researcher, as experts suggest appropriate use restricts Type I errors (Guilbaud & Karlsson, 2010; McHugh, 2011; Vialatte & Cichocki, 2008).

Table 9

*Student Engagement Classroom Observations and Tablet Methodology*

| Tablet Method | $p$-value |
| --- | --- |
| One-to-one (1) v. <10 tablets (3) | .042 |
| Two-to-one (2) v. <10 tablets (3) | .038 |

A post hoc comparison was performed, making multiple comparisons with the tablet methodology. At the 95% confidence interval, a significant difference was found in two comparisons at the $p = .05$ level. Student engagement in the classrooms with one-to-one and two-to-one tablets was significantly higher than those classes with fewer than 10 tablets. An

independent samples *t*-test analysis was conducted on the subject area of the lesson being taught. The test analyzed math vs. non-math subjects such as reading, science, and writing. There was an *n* of 6 for math, and an *n* of 4 for non-math classes. There were no significant differences ($p = .257$ at the 0.05 level of significance) between math and non-math subjects.

Chi-squared goodness-of-fit is a statistical test utilized to test the null hypothesis (Laszlo, Feher et al., 2013; Ludbrook, 2011; McHugh, 2013; Tanner, 2012). A chi-squared goodness-of-fit test was conducted initially on the classroom observations. The 10 classrooms were averaged to look at proportions for each of the classrooms. No significant difference was found between the observed (obtained) and the expected (predicted) frequency in each class.

## Qualitative Results

Qualitative results emanated from field notes, journaling, pre-survey questions, open-ended questions from the electronic teacher survey, and the teacher interviews. All the results are from the site school, Olympic Mountain Elementary, located in the Pacific Northwest.

**Field notes and journaling results.** In the planning stages of the study and during data collection, analyzing of data results, and reflection, the researcher utilized field notes and journaling (Marshall & Rossman, 2011; Merriam, 2002). Notes were used for planning, determining research site logistics, and journaling different aspects of the research process. Qualitative observations in the field were made both onsite and offsite after data gathering sessions. Journal writing can assist researchers in managing their own emotions and provide some relief from anxiety (Creswell, 2014; Marshall & Rossman, 2011; Merriam, 2002). Making notes and journaling during classroom observations were helpful exercises, especially during the piloting process. The act of going through the classroom observation and detailing some of the experiences and taking notes in the field assisted the researcher in altering the classroom

observation form to construct a more effective instrument when the actual classroom observations began.

**Pre-survey results.** Of the 30 teachers who completed the pre-survey, 90% indicated they were not familiar with blended learning (see Figure 11), while 100% stated they did not know terminology and models associated with blended learning (see Figure 12). However, a few participants made some statements about what they thought blended learning meant in educational practice.

*Pre-survey question 1: Are you familiar with the term blended learning?* Although 90% of the participants responded "no" to the question, five teachers included their ideas about the definition of blended learning (see Table 10). Two out of the 30 participants indicated that they were familiar with the term blended learning.

Table 10

*Top Three Definitions of Blended Learning from Pre-survey Question 1*

| Teacher Participant | Frequency of Responses ($n$) |
| --- | --- |
| Using a variety of methods/technology | 5 |
| Ability to learn with a variety of tools | 1 |
| Combining tablets/tech with traditional instruction | 1 |

*Pre-survey question 2: Are you acquainted with blended learning terminology and models?* For this question, 100% of 30 participants indicated that they were not familiar with blended learning terminology or models (see Figure 13), although one participant expressed that blended learning models included the use of iPads, Promethean Boards, white boards, and other tools for instruction.

**Online survey results.** All 30 participants completed the survey for a 100% response rate. The survey consisted of Likert scale questions, followed by open-ended questions. The survey was administered to certificated staff members following their completion of the pre-survey. Twenty-eight of the participants defined the methods of professional development they preferred, and the top three methods by frequency are displayed in Table 11.

Table 11

*Top Three Preferred Methods of Professional Development by Frequency*

| Preferred Method of Professional Development | Frequency of Responses (*n*) |
|---|---|
| Hands-on training | 17 |
| Face-to-face training | 14 |
| Collaborative professional development | 8 |

The overarching theme for the qualitative portion of the online survey was the improvement of the facilitation of technology. Within the responses, three subthemes emerged: (a) professional development, (b) district-level technology supports, and (c) resources. Professional development was the foremost common thread to the enhancement of teacher skills needed to deliver effective instruction to students.

District-level supports included having professional development time carved out of teachers' schedules along with the resources needed to be effective in their positions. Most participants identified their building as being in a superior position for building-level supports, although staff appeared to desire more collaboration and desired to have the full scope of professional development opportunities district wide. Resources identified by participants included district-level professional development opportunities, acquisition of additional

equipment/devices, and technology support for equipment not working properly to avoid having to rely on their peers who are busy teaching their own classes.

**Interview results.** The researcher utilized Audacity (2014), a free, cross-platform sound editor, which was downloaded onto a laptop for recording interviews (Marshall & Rossman, 2011). Participants were provided with a copy of the research questions and encouraged to respond at a pace that was comfortable for them.

Measuring the frequency of similar responses from participants is useful in quantifying or measuring what data participants have in common (Marshall & Rossman, 2011). Table 12 displays the development of frequency codes based on the interview participants' responses (Creswell, 2014; Marshall & Rossman, 2011; Merriam, 2002).

Table 12

*Top 10 Frequency Themes from Interviews*

| Teacher Participant | Frequency of Responses |
| --- | --- |
| Incorporation of Tablets into the Classroom | 151 |
| Utilization of Apps for Content Areas | 84 |
| Technology Use in the Classroom | 74 |
| Professional Development Needs: Tablets, Technology | 39 |
| Collaboration With Peers/Other Teachers | 20 |
| Differentiation of Instruction for Students | 18 |
| Engagement of Students in the Material | 10 |
| Increase in Student Motivation During Tablet Use | 9 |
| Blended Learning Terminology | 8 |
| Integration of Technology into Instruction | 6 |

From the frequency analysis and coding of the interviews, themes emerge from the data (Creswell, 2014). The following statement was provided to interview participants based upon the results of the teacher responses in the pre-survey indicating a lack of familiarity with blended learning: The term blended learning in the context of this K-5 study means utilizing different technology devices as a means to enhance teaching (Christensen, Horn, & Staker, 2013; Horn & Staker, 2012; Pointek, 2013b).

Emergent themes from the qualitative interviews are shown in Figure 13. Blended learning, including the integration of technology such as tablet usage into best practice in the classroom, was one of the themes.

Figure 13

*Themes from Interview Data*
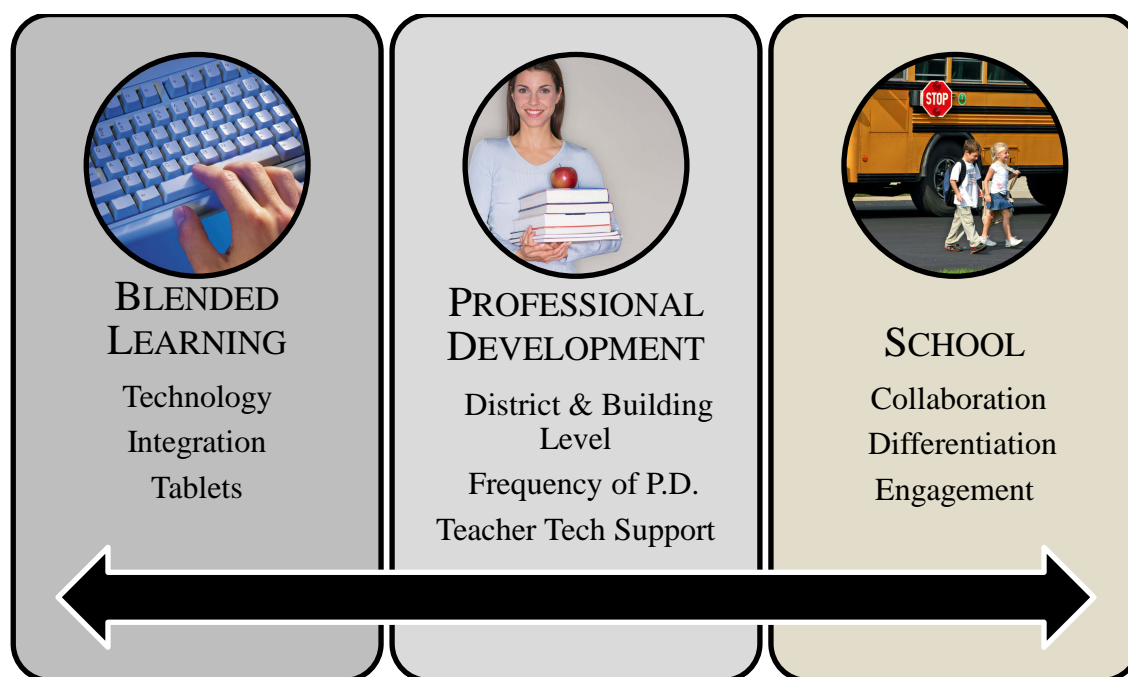


One teacher summed up that with all the technology, "the students probably love the tablets the best." Some participants use the tablets for all academic subjects to differentiate learning,

facilitate student collaboration, provide direct instruction, encourage student practice, manage transition times, and improve writing and sequencing of stories.

Professional development was another theme, and factors included both building- and district-level support, the frequency of professional development, and teacher technology support. One participant noted that she implements any technology she can into the curriculum. She reported that she was not a "techie" person, though after evaluating how technology could enhance her teaching, she was excited to develop her proficiency with technology tools. Another teacher said for those learning technology, "Don't give up! Be willing to try new things. Be fearless and have fun!"

The third theme was the school as the vehicle for teacher collaboration, differentiation for students, and engagement of students. During the interview, one participant noted, "Collaboration is so important, not just for the teachers, but the *students* are collaborating." Multiple teachers in the interviews, observations, and survey reported that blended learning, and specifically tablet usage, is a tool used for differentiation. Advanced students can excel and execute higher-level tasks while the teacher can do remedial work with those who need more support. Utilizing technology provides one of the biggest sources of engagement in learning. The teacher can connect the laptop to their smart board and show the student work on the screen. Teachers have the ability to gain results of quizzes in seconds and know who is in need of more assistance at a single moment in time. The students want to see that immediate feedback. Technology provides the opportunity for teachers to quickly conduct interventions and assessments on a daily basis. Teachers reported that students understand what to do much more often and they delve into higher thinking skills.

Participants stated that tablet usage was making them better teachers, and they were able to explore and fulfill Bloom's Taxonomy as students were able to explain their thinking (Bloom, et al., 1956). One participant specified:

I could see the immediate effect upon the children with just one iPad. Now I find our transition time between activities is quicker than ever. Children have access to apps and websites that allow them to progress at their own pace and learning levels. The tablets are beneficial, especially for struggling students. I use the iPads for both lower students and for higher students.

As well as talking about the benefits of blended learning, teachers also mentioned the challenges they encountered. A barrier to teacher improvement has been the amount of time required outside of the regular teaching day to become familiar with blended learning options and tablet proficiency. Another challenge teachers reported was the time it took to get the tablets set up in a manner that worked for their classroom and finding the most appropriate apps for their lesson or content area. Participants expressed a desire to hear from other teachers who have higher numbers of tablets in their classrooms, utilize webinars and blogs, and have adequate charging stations for the iPads. To meet another challenge, they developed a tech buddies program to help students learn how to use apps and manage the iPads. As students practice with tech buddies, they become comfortable with the apps before they experience them on their own.

Participants relayed the necessity of a professional development continuum or menu of options for teachers implementing technology into their pedagogy. The idea of a rating system or evaluation tool would more effectively demonstrate their growth as a teacher in the area of technology. Several teachers reported they would like more regional or district-level tablet usage classes to utilize professional development with a broader range educators than just their

building level peers. Teachers wanted to know how to bring more technology to more kids through professional development opportunities.

Finally, drawbacks of tablet use as reported by participants included the fact that apps get expensive, and some students may think they are a toy upon initial use, though teachers can show students how tablets can be used educationally so they are building on their skills. This latter drawback did not appear to be a factor with teachers who had been using tablets for several months.

**Summary**

Chapter IV provided results of this mixed-method, case study research. Both quantitative and qualitative data were collected in this study of best practices in blended learning in a rural elementary setting with findings supporting blended learning as a best practice, and improvement in student engagement with two students, or fewer, per tablet.

Pre-survey results indicated 90% of the participants were not familiar with blended learning terminology or models. Likert teacher survey results showed preferred methods of professional development by frequency were hands-on, face-to-face, and collaborative. Improvement of the facilitation of technology emerged as a predominant theme for the qualitative portion of the online survey. Three subthemes of teacher needs emerged: (a) professional development, (b) district-level technology supports, and (c) resources. Teachers stressed that professional development was needed to enhance their skills in using technology to deliver effective instruction to students.

Emergent themes were: (a) blended learning, including the use of technology in schools, tablet usage, and the integration of these elements into best practice in the classroom, was beneficial and engaging; (b) frequent training at both the building and district levels and teacher

technology support were key to professional development; and (c) teacher collaboration, differentiation for students, and engagement of students were all pertinent to the role of the school.

The top three themes were compiled from the qualitative portion of the online survey. Professional development needs emerged as being the foremost common thread to the enhancement of teacher skills needed to deliver effective instruction to students, consistent with Danielson's Domain 4, professional responsibilities, growing and developing professionally (Danielson, 2013). District-level supports include having professional development time carved out of the teacher's schedule along with the resources needed to be effective. Hands-on was the most preferred method of professional development. Next teachers indicated they wanted face-to-face professional development followed by collaborative effort.

*Theme One: Collaboration.* Participants consistently identified collaboration as being important to professional development, consistent with Danielson's (2013) framework for teaching. Research on the effectiveness of professional learning communities, a method of collaboration for educators, is supported by the interview results in this study (Danielson, 2013; DuFour, Dufour, & Eaker, 2008; DuFour et al., 2010; DuFour & Marzano, 2011; Easton, 2009). Teacher collaboration in a blended learning environment as found in this research included common planning, problem solving, informal sharing, talking about apps that work for specific content areas and updates to those apps, ideas from blogs, educational sites and conferences, formal professional learning communities (PLC's), strategies for implementation of technology, sharing resources, and the formation of a building-level technology team. Those elements support what researchers include in best pedagogical practices in education (Danielson, 2013;

DuFour & Marzano, 2011; Marzano & Brown, 2009; Pacansky-Brock, 2013; Pointek, 2013b; Schmoker, 2011; Sheninger, 2014).

*Theme Two: Blended learning.* Teachers identified blended learning, and specifically, tablet usage, as an effective approach to instruction. The findings in this study support blended learning as a best practice method to meet the diverse needs of students (Horn & Staker, 2011; Flanigan, 2014b; Simon, Nemeth, & McManis, 2013; Thiele, 2013). In blended learning, technology, instruction, and content can be adjusted to each student's needs (Roseth, Akcaoglu, & Zellner, 2013; Tao, Fore, & Forbes, 2011). Findings from participants in the interviews, observations, and Likert survey, all support using technology to meet the spectrum of student needs (Simon, Nemeth, & McManis, 2013). Advanced students can excel and perform higher-level tasks while the teacher can work on remediation and repetition with those who require more support. The site school in this study was proactive in its attainment and implementation of technology. Implementing technology to the extent to which the leader(s) demonstrate technology practices through their role as a change agent, was another factor in theme two (DuFour & Marzano, 2011; Flanigan, 2014a; Fullan, 2014; Pointek, 2013a; Sheninger, 2014; Simon, Nemeth, & McManis, 2013). At Olympic Mountain, the administrator was leading change by example, which was a variable in successful building-level integration, as demonstrated in this case study.

*Theme Three: Professional development.* Evidence from the classrooms observation results in this study indicated that exemplary implementation of blended learning requires more than adding tools to classrooms, as noted in research (Johnson, 2012; Pacansky-Brock, 2013; Simon et al., 2013). It also requires training. Professional development results ranged from participants who wanted to manage the organization of charging stations for devices, to the more advanced educator who facilitated training for peers so their students could easily access and

show their work. Building and district-level training, the frequency of professional development, and teacher technology support were all key to professional development, which supports research findings (Danielson, 2013; Fullan, 2014; Johnson, 2012). Finally, school as the vehicle for teacher collaboration, differentiation for students, and engagement of students, were all pertinent to the role of the school.

**Chapter V**

**Conclusions**

**Introduction**

Blended learning in schools is on the rise (Ambient Insight, 2014; DreamBox, 2014a; Flanigan, 2014b; Fullan, 2014; Kumar, 2014; Office of Science & Technology Policy, Executive Office of the President, 2014; Scanlon, 2014; Sheninger, 2014; Stein & Graham, 2014). Efforts to expand technology in education are evident from President Obama's recent announcements and policies. President Obama proclaimed $750 million in pledges from U.S. corporations to start installing additional technology capabilities in schools (Lederman, 2014; U.S. White House, 2014). The U.S. Office of Science and Technology Policy released a 2015 science and technology budget that encourages innovation for all Americans (Office of Science and Technology, U.S. White House, 2014). Further, the Obama administration has been supportive of technology in education with tools such as Open Educational Resources (OER), which releases the copyright licenses to allow for no-cost use, enhancement, and revisions of materials (Plotkin & Chien, 2014).

Efforts to outline twenty-first century skills needed for K-12 in the U.S. are evident in organizations such as Partnership for 21st Century Skills, who indicate that students need "digital age literacy, inventive thinking, effective communication, and high productivity" (Kumar, 2014, p. 177). In considering the most effective ways to address changes needed in schools, Fullan (2014) considers technology as the "wrong driver" and "pedagogy" as the "right driver" (p. 25). Fullan (2014) suggests:

The investment in technology has largely been a matter of acquisition—buy, buy, buy—not a matter of figuring out how pedagogy (new forms of instruction) can use computers, personal devices, software, and the like to deepen and accelerate learning (p. 36).

In schools, the use of a tablet device is becoming more common (Fullan, 2014; Getting & Swainey, 2012; Huang, Clark, & Wedel, 2013; McLester, 2012; Sheninger, 2014; Stein & Graham, 2014). The intent of this study was to explore best pedagogy practices in a K-5 blended learning environment and the use of tablets in the classroom. The researcher's desire to discover how to engage K-5 students by utilizing the best teaching practices in blended learning led to these three primary questions:

1. What tablet methodology supports best practices in a K-5 blended learning environment?

2. How does tablet use impact student engagement?

3. With an increase in the use of tablets in classrooms, what are teacher perceptions of professional development and needs?

This study examined factors of student engagement in a blended learning environment through a mixed methods, case study design. The researcher investigated blended learning as a best practice in a public rural elementary school environment. The participants were from Olympic Mountain Elementary (pseudonym) in the Pacific Northwest. Chapter V details the interpretation of the results and themes, draws conclusions, makes recommendations for further research, and provides implications for professional practice. Danielson's instructional guidelines for teaching were utilized as the educational framework for this research.

**Summary of the Study**

As demonstrated in Figure 9, a mixed methods study was developed to address the comprehensive aspects of blended learning including best practices in pedagogy and student engagement in a K-5 setting (Marshall & Rossman, 2011; Merriam, 2002). Multiple sources of quantitative and qualitative data comprised this mixed-method case study research design (Creswell, 2014; Creswell & Plano Clark, 2007; Merriam 1988; Yin, 2014).

The researcher endeavored to determine whether there is a relationship between student engagement and blending learning environments by examining quantitative data from a pre-survey, a Likert scale survey, and classroom observations. Qualitative data included results from field notes and journaling, a pre-survey, open-ended online survey responses, and interviews.

**Quantitative analysis.** Data from several methods were analyzed for this study. Data was collected from two pre-survey questions, an online multiple choice survey, and classroom observations.

**Pre-survey.** The paper-and-pencil pre-survey administered to certificated teachers at the onset of this study provided evidence, as shown in Figure 14, that blended learning was unfamiliar to the rural elementary school teachers in this study. Further, 100% of the participants in the pre-survey indicated that they were not familiar with blended learning models or terminology.

Figure 14

*Pre-survey Summary*
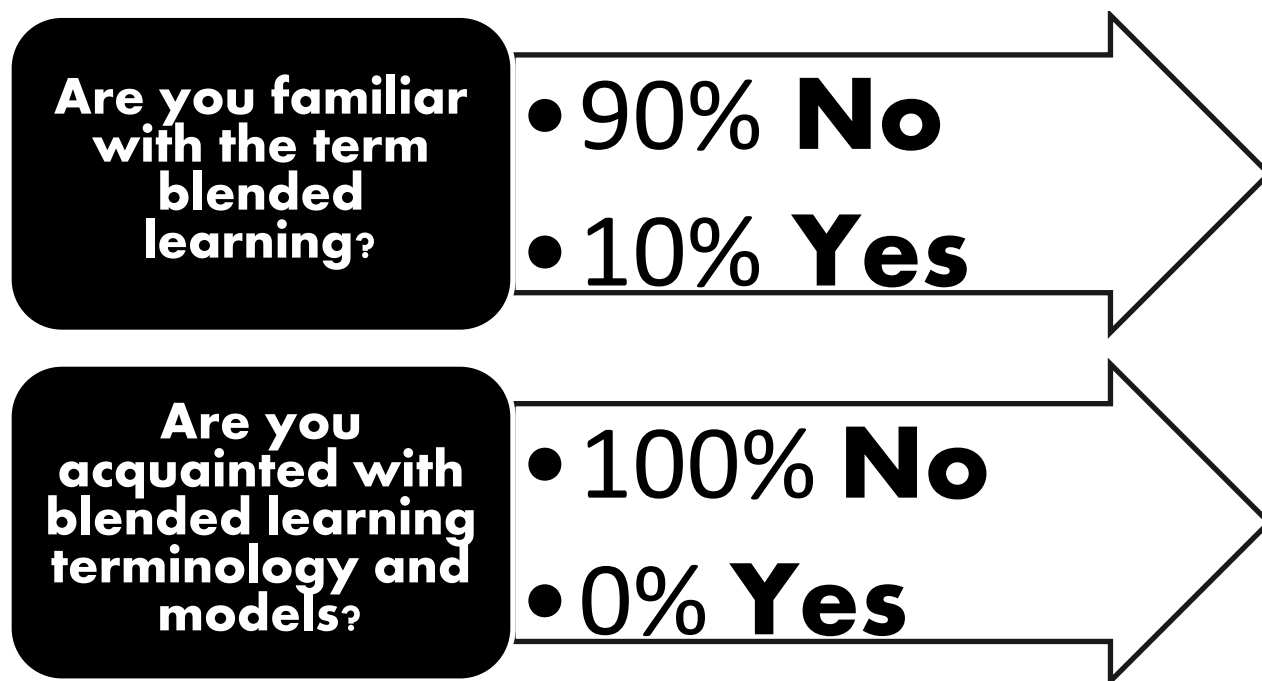


While research has shown that blended learning environments and the integration of technology in classroom activities can be an effective means of learning for many students, the pre-survey findings in this study communicates a lack of familiarity with blended learning as a best practice and as research-based good pedagogy (Beaudry, 2011; Lefton, 2012; Richardson, 2010; Riddle, 2010; Rosen & Beck-Hill, 2012; Ruiling & Overbaugh, 2009).

**Likert scale survey.** There were 30 participants who completed the survey, which represents a participation rate of 100%. Supporting current research trends, 73% of the participants in this study thought students were more engaged when utilizing tablet devices (Bauland, 2012; Beaudry, 2011, Chong, 2012; Gathany, 2012; Goldstein, 2010; Shaw, 2010). An overwhelming 93% of participants would seek professional development opportunities involving

digital technologies and 97% of those staff in this case study were interested in increasing their digital technology skills.

**Classroom observations.** Classroom observations were conducted to measure the relationship between student engagement and tablet methods. A matrix of Olympic Mountain Elementary School demonstrated various methods of tablet usage across and within the varying grade levels (Table 7). Both students from classes with ratios of one student per tablet and two students per tablet were significantly more engaged than students from classrooms with fewer than 10 tablets. Higher engagement rates support positive learning outcomes, as evidenced in research (Christenson et al., 2008; Christenson, Stout, & Pohl, 2012; Christenson, Reschly, & Wylie, 2013; Finn & Zimmer, 2013; Marzano & Brown, 2009; Raftery, Grolnick, & Flamm, 2013; Reschly & Christenson, 2013; Skinner & Pitzer, 2013).

In answer to the first question in this study, "What tablet methodology supports best practices in a blended learning environment?" results from this study indicate one-to-one and two-to-one methods proved to be equally effective, and both showed significantly higher rates of engagement over the classrooms with fewer than 10 tablets. This study adds to current literature that blended learning transforms and augments effective teaching, and shows higher rates of student engagement with more devices in the classroom (Christensen, Horn, & Staker, 2013; Horn & Staker, 2012; Pointek, 2013b). Several factors could impact those results: teacher experience, comfort level with tablets, professional development, and teacher time spent implementing technology into the daily routine. Teachers who had the most tablets in their classrooms had made assertive efforts to gain the technology through using professional development money, trading instructional leadership class offerings in exchange for technology, using PTA funding, and seeking additional funding opportunities for technology. These findings

support the literature indicating public school technology integration is varied from district to

district and state to state and financial commitment is required to successfully deliver blended

learning options (Bauland, 2012; Chong, 2012; Hoyle & Kutka, 2008; Lefton, 2012; Riddle, 2010;

Ruiling & Overbaugh, 2009). Also in this case study, the principal in the site building was a

proponent of technology and was instrumental in securing devices when other buildings within

the district were more reluctant pursuers of technology. This supports current research showing

the influence of administration in successful technology integration (DuFour & Marzano, 2011;

Fullan, 2014; Sheninger, 2014).

**Qualitative analysis.** Encouraging results for staff and students were found in this study,

despite the slow implementation of technology in public schools (Bauland, 2012; Hoyle & Kutka,

2008; Lefton, 2012; Quillen, 2010; Richardson, 2010; Riddle, 2010; Ruiling & Overbaugh, 2009).

Qualitative data analysis from the pre-survey, open-ended Likert online survey questions, and

interviews offered common themes which connect to the quantitative data (Creswell, 2014;

Lincoln & Guba, 1985; Marshall & Rossman, 2011; Merriam, 1988; Yin, 2014).

**Pre-survey.** Surprisingly, 90% of the participants were not familiar with the term

blended learning, and 100%, of 30 participants, indicated that they were not familiar with

blended learning terminology or models (see Figure 15), though one participant expressed that

blended learning models included the use of iPads, Promethean Boards, white boards, and other

tools for instruction. Findings indicated that as the educators learned blended learning

terminology, they became aware of their practices within the scope of blended learning as a

pedagogy.

**Likert survey, open-ended questions.** After completing the pre-survey, 30 participants

completed the online survey, representing a 100% participation rate. There were Likert

questions, followed by open-ended questions at the end of the online survey. The top three

themes were compiled from the qualitative portion of the online survey. Professional

development needs emerged as being the foremost common thread to the enhancement of teacher

skills needed to deliver effective instruction to students. This is consistent with the Growing and

Developing Professionally component of Danielson's Domain 4 (Danielson, 2013). The needs

included both district-level and building-level supports. District-level supports include allowing

professional development time to be carved out of the teacher's schedule along with providing

the resources needed to be effective. Most participants identified their building as being in a

superior position for in-house supports.

Hands-on was the most preferred method of professional development. Teachers

indicated they wanted face-to-face professional development followed by collaborative effort.

Staff desired more collaborative and wide-ranging professional development opportunities,

including opportunities to collaborate with other teacher's district wide. This is consistent with

the Participating in the Professional Community component of Danielson's Domain 4

(Danielson, 2013).

**Interviews.** Evidence from the teacher interviews in this study support other researchers'

evidence of the positive instructional benefits of incorporating technology into public schools in

America (Bauland, 2012; Christensen, Horn, & Staker, 2013; Colandrea, 2012; Goldstein, 2010;

Malone, 2012; Pacansky-Brock, 2013; Pickett, 2012). A total of 16 interviews were conducted at

Olympic Mountain Elementary utilizing Audacity (2014), two interviews with each of the eight

teachers who participated in the qualitative portion of this study (see Appendices O and P). From

the frequency and coding of the interviews, themes emerged from the data (Creswell, 2014;

Marshall & Rossman, 2011). Participants reported that using technology as a tool is motivating

for students and enables students to achieve higher levels of learning. They indicated that students are in the classroom right away in the morning, even coming early to work on their projects, and sometimes stay in at recess to work. Student motivation shows in their projects. Participants reported that students appear challenged and motivated when they receive immediate feedback and can monitor their learning progress. Students are proud of their achievements and empowered to strive for higher goals, according to participants. Self-confidence builds as students develop a "can do" attitude, because they know how far they have come and they anticipate their next step in learning. One teacher of first graders stated that "kids like the visual aspect; when things move around, students can get connected with it." Teachers reported that tablets enhance student learning and provide additional support for individual needs.

*Theme One: Collaboration*. Participants consistently identified collaboration as being important to professional development, consistent with Danielson's (2013) framework for teaching. Research on the effectiveness of professional learning communities, a method of collaboration for educators, is supported by the interview results in this study (Danielson, 2013; DuFour, Dufour, & Eaker, 2008; DuFour et al., 2010; DuFour & Marzano, 2011; Easton, 2009). Teacher collaboration in a blended learning environment as found in this research included the following: common planning, problem solving, and informal sharing; talking about apps that work for specific content areas and updates to those apps; gathering ideas from blogs, educational sites and conferences; participating in formal professional learning communities (PLCs); working together on strategies for implementing technology, sharing resources; and forming building-level technology teams. Those activities support what researchers include in best pedagogical practices in education (Danielson, 2013; DuFour & Marzano, 2011; Marzano &

Brown, 2009; Pacansky-Brock, 2013; Pointek, 2013b; Schmoker, 2011; Sheninger, 2014). In the teacher interviews, one participant reported, "Collaboration is so important, not just for the teachers, but the students are collaborating." Interviewees reported that students seem to have a better understanding of their work, and they delve into higher-level thinking skills. This supports the Setting Instructional Outcomes component of Danielson's Domain 1.

**_Theme Two: Blended learning._** Blended learning was defined for teacher participants in the interview portion of this study, as blended learning is a broad term which can mean different things to different people. The term blended learning in the context of this K-5 study means utilizing different technology devices as a means to enhance teaching (Christensen, Horn, & Staker, 2013; Horn & Staker, 2012; Pointek, 2013b). Blended learning, including the use of technology in schools, tablet usage, and the integration of these elements into best practice in the classroom, emerged as the second theme.

Teachers identified blended learning, and specifically, tablet usage, as an effective approach to instruction. The findings in this study support blended learning as a best practice method to meet the diverse needs of students (Horn & Staker, 2011; Flanigan, 2014b; Simon, Nemeth, & McManis, 2013; Thiele, 2013). In blended learning, technology, instruction, and content can be adjusted to each student's needs (Roseth, Akcaoglu, & Zellner, 2013; Tao, Fore, & Forbes, 2011). Findings from participants in the interviews, observations, and Likert survey support using technology to meet the spectrum of student needs (Simon, Nemeth, & McManis, 2013). Advanced students can excel and perform higher-level tasks while the teacher can work on remediation and repetition with those who require more support.

Embedding technology into learning is an ongoing practice that varies greatly depending on funding, leadership, and professional development practices (Beaudry, 2011; Goldstein, 2010;

Shaw, 2010; Velez, 2012). Public schools must integrate technology to successfully deliver

blended learning options, and this integration clearly requires a financial commitment (Bauland,

2012; Chong, 2012; Hoyle & Kutka, 2008; Lefton, 2012; Riddle, 2010; Ruiling & Overbaugh,

2009). The site school in this study was proactive in its attainment and implementation of

technology. The leader of Olympic Mountain Elementary made technology use a priority and

advocated for the needs of the building, and teachers within the building took advantage of all

available opportunities to gain digital devices. Further, most of the teachers were self-taught.

Rather than learning through formal professional development, they instead spent their time

outside of the classroom to become proficient and then implemented that learning inside their

classrooms.

Implementing technology through leaders who demonstrate technology practices through

their role as a change agent was another factor in theme two (DuFour & Marzano, 2011; Flanigan,

2014a; Fullan, 2014; Pointek, 2013a; Sheninger, 2014; Simon, Nemeth, & McManis, 2013). At

Olympic Mountain, the administrator was leading change by example, which was a variable in

successful building-level integration, as demonstrated in this case study. Teachers involved in this

study implemented technology through use of various tools, such as the Promethean board,

ActiVote, flip charts, YouTube videos, Internet, snippets of songs, document camera, and

different apps for different content areas. Teachers reported seeing engagement and involvement

improve when they used these tools.

Interview participants reported that of all the technology, "the students probably love the

tablets the best." They are mobile and the students love them. The teacher can connect the laptop

to a smart board and show the students' work on the screen. The students want to see that

immediate feedback. Tablets and other forms of technology enable teachers to employ various

methods of quickly implementing interventions and assessing students on a daily basis. Teachers are able to have results of quizzes in seconds and know which students need more support. This supports current research and the Demonstrating Knowledge of Content and Pedagogy in Danielson's Domain 1 (Danielson, 2013; Pointek, 2013a; Stein & Graham, 2014).

Although utilizing technology provides one of the biggest sources of engagement in learning, as evidenced in this study via classroom observations, interview data, and the teacher survey, a digital divide gap exists between schools usually due to funding. The literature provided mixed reviews as to whether the divide is narrowing (Chong, 2012; Reiss 2013). Stein and Graham (2014) indicate that site mobility, accessibility, enhanced knowledge, and diminished expenses with blended learning provide some fiscal incentives for implementing technology. While fiscal benefits may exist, they were not perceptible in the findings of this study.

***Theme Three: Professional development***. The classroom observation results in this study, as well as results from other research, indicated that exemplary implementation of blended learning requires more than adding tools to classrooms (Johnson, 2012; Pacansky-Brock, 2013; Simon, Nemeth, & McManis, 2013). It also requires training. With the technology come challenges for teachers who are not as comfortable with it as their peers. Developing technology use skills within the educators is key to successful blended learning for students (Pacansky-Brock, 2013; Partnership for 21st Century Skills, 2014a; Sheninger, 2014; Stein & Graham, 2014).

Professional development comments ranged from participants who wanted to manage the organization of charging stations for devices, to the more advanced educator who facilitated training for peers so their students could easily access and show their work. By developing a

building technology team, Olympic Mountain Elementary staff members have ensured they can maintain the progression and use of technology at the forefront of education in their building. The building-level technology team has provided professional development based on the needs in the building, though it was clear through the survey, interviews, and classroom observations that district-level professional development and collaboration is desired. The district has not had a technology levy, though that was brought up by several participants. Tailoring professional development to staff needs and forming levels of technology advancement were appealing to several teachers. Building and district-level training, frequent professional development, and teacher technology support were all key to professional development, which supports other research findings (Danielson, 2013; Fullan, 2014; Johnson, 2012). However, the professional development findings in this study were in contrast to Pointek's (2013a) statement that limited professional development is required as the practice of blended learning is child-focused. While professional development is paramount for both teacher and student success, the school as the system in which teacher collaboration, differentiation for students, and engagement of students, were all pertinent to the role of the school.

**Conclusions**

The results of this study enhance the body of literature in blended learning practices (Creswell, 2014; Marshall & Rossman, 2011; Merriam, 1988; Stake, 1995). Teachers overwhelmingly conveyed that blended learning facilitates their improvement as professionals, makes their students more productive, and results in elevated test scores. This case study research set in a rural, elementary school help fill a gap in the literature about blended learning and student engagement.

Teachers indicated they have sufficient access to the tools needed to teach to specific learning targets. Findings suggest teachers self-evaluate their skills as teachers more frequently, reflecting on their instructional practices. Results indicated that educators who have implemented blended learning practices cannot imagine going back to traditional classrooms as evidenced by their ongoing formative assessments. Participants remarked that having the ability to constantly assess (both quantitatively and qualitatively) and gauge the extent to which their students were absorbing the content, allowing for continuous diagnostic data to the teacher, a powerful tool for educators.

Findings from the data in this study support research suggesting that engagement can be a predictor of student outcomes (Anderman & Patrick, 2013; Finn & Zimmer, 2013; Reeve, 2013; Reschly & Christenson, 2013; Skinner & Pitzer, 2013). Teachers utilizing tablets in this study drew on a variety of different strategies to engage their students and were intentional about their methods to keep learning fresh, even if they did not find success on the first attempt. With tablet use, participants promoted student collaboration, which teaches students valuable social skills and allows students to be the teacher. Student-led discussions and students teaching their peers leads to higher levels of learning, both of which were observed by the researcher in this study. Whole brain research and other research-based strategies are powerfully combined in a blended learning environment resulting in seamless differentiation for students. Strategies such as having students take video footage of their projects and learning demonstrate evaluative strategies, the pinnacle of Bloom's taxonomy. Findings from this study indicate higher levels of student engagement which reflects a promising learning environment for schools where blended learning has been implemented.

**Implications and Challenges for Professional Practices**

Based on the findings in this research study, schools need to define their goals and vision towards effective implementation of technology (Fullan, 2014, Sheninger, 2014; Stein & Graham, 2014). Rather than identifying technology as a separate entity, schools must fully integrate technology into current pedagogical practices and move forward to involve district and community stakeholders (Fullan, 2014; Johnson, 2012; Sheninger, 2014; Stein & Graham, 2014). Technology leaders generally manage the infrastructure and technical aspects of integration, though fiscal oversight and input from board members, parents, and community members are needed to determine how to fund the infrastructure and growth needs.

Instructional leaders should outline professional development that incorporates blended learning for teachers, enabling effective twenty-first century learning for students, such as depicted in Figure 16. Transferring traditional methods of instructional pedagogy to a blended learning classroom will be inadequate in the 2014 classroom and beyond. Students need skills such as those shown in the Framework for 21st Century Learning, as they live in a complex world and require skills to effectively navigate their learning now and in the future (see Figure 15).

Findings from both qualitative and quantitative data indicate that teaching practices are always changing, and there are always ways to improve. Teachers want their students to improve, and adapting new methods to reach all learners is appealing. Formulating a plan to implement CCSS, teaching frameworks, and other mandates may seem overwhelming, but with intentional planning and drawing on the benefits of blended learning practices, teachers and administrators can help students meet and achieve the twenty-first century skills required to succeed.

Figure 15

*Framework for 21st Century Learning*



**Framework for 21st Century Learning**
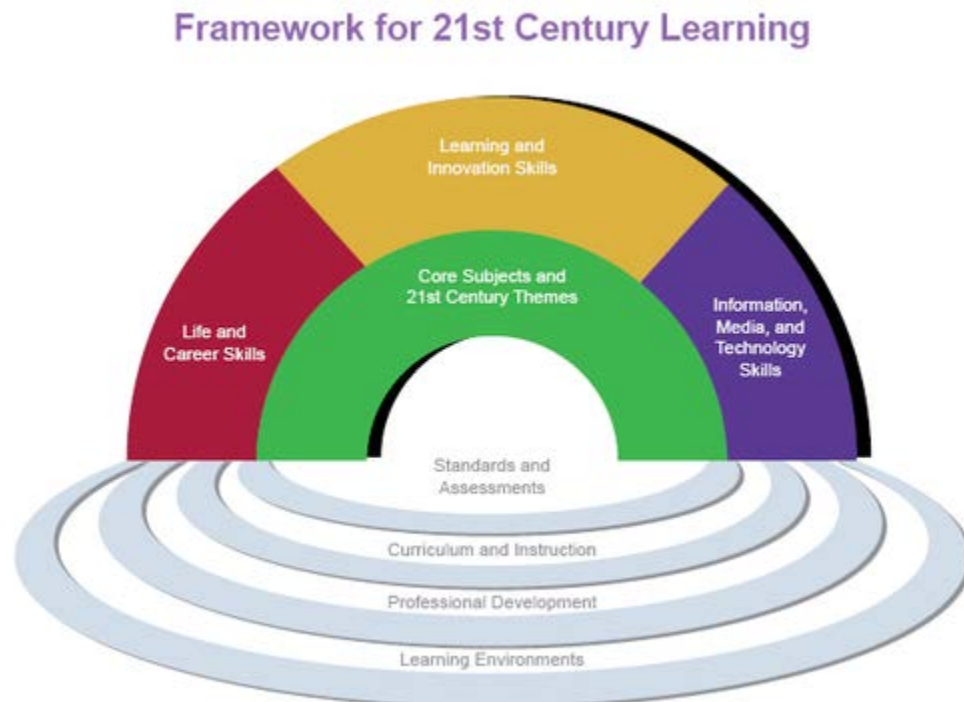
SOURCE: Partnership for 21st Century Skills (http://www.p21.org/)

Today's students are what some call "digital natives" who are growing up in a technology-oriented society and who expect digital tools to be a part of their learning environment (Stein & Graham, 2014). If educators have not fully integrated technology into pedagogical practices, how can schools provide students with twenty-first century skills as outlined in Figure 15? Fullan (2014) suggests that technology is:

1. irresistibly engaging for students and teachers,

2. elegantly efficient and easy (from a technical standpoint) to use,

3. ubiquitous 24/7, and

4. steeped in real-life problem solving (p. 146).

Fullan calls for a "new pedagogy" in which pupils and educators work collaboratively, though in this study, the new pedagogy already exists, and it is called blended learning. It appears that blended learning, as a best practice, still has not had widespread awareness and application in the public school setting. While blended learning as discussed earlier in this paper has different definitions and applications, blended learning terminology and models are still not widely known throughout some sectors of education.

**Recommendations for Future Research**

Fullan (2014) states that "technology is running wild," which provides abundant, though perplexing, "implications for implementation" (p. 12). We will need the qualities of Kirtman's "competent leader" who is willing to take risks, establish relationships, provide direction through a collaborative plan, put the good of the school first, maintain an earnestness for results, and pledge unceasing growth (Fullan, 2014; Kirtman, 2013).

There is little research about blending learning practices in public schools at the elementary level, and even less at the early childhood education level (Beaudry, 2011; Bennett, 2012; Gathany, 2012; Lefton, 2012; Pass, 2008; Riddle, 2010; Ruiling & Overbaugh, 2009). Roth (2012) reports only 36% of students were equipped with the readiness necessary to enter kindergarten. This study supports the finding from other studies that blended learning is one of the best teaching practices while it helps fill that early childhood gap. Further studies could investigate how to align early learning needs in a blended learning environment while addressing concerns that young children already spend too much time with technology rather than adult or peer interaction.

Technology leaders or those who work directly in digitally-related fields may be more adept at understanding the spectrum of options available to educators, indicating the need for professional development among administrators who are responsible for teaching and learning. Professional development is required for teachers as well to address consistent, best-practices application of technology integration. The results from this research will help public schools plan how to integrate technology into current pedagogical practices and realize the professional development commitments required for effective implementation. Districts will need to plan the infrastructure, determine technology needs, and develop a funding approach while matching professional development to the identified planning. Without sufficient professional development and planned implementation, teachers have devices that sit unused or are minimally used as an add-on in the classroom, rather than having the benefits of full integration in a blended learning environment.

The results of this study support Scanlon (2014) who ascertains that technology eliminates obstacles between casual and more prescriptive education practices. Schools in the beginning stages of discerning how to effectively integrate technology into their teaching methods must evaluate their current focus, maintain resolve to pursue effective decisions, and manage dynamic transformation (Fullan, 2014). Further challenges include: developing needed infrastructure, overcoming topographical challenges, managing the imbalance of access to certain groups or regions, and recognizing technology users are complex with different levels of proficiency (de Waard, 2014).

Some challenges in blended learning practices identified by teachers in this study include: finding time to really delve into the apps available for each content area, effectively implementing their digital devices, matching learning targets, aligning their work with the

Common Core State Standards, following district-adopted frameworks such as Danielson's work, and determining which blended learning techniques are worth their time. Concerns surfaced about how to best obtain assistance with equipment when it is not working properly, though teachers recognized that they have to be resilient to work through issues and problem solve.

Parsons (2014) warns educators not to overlook wisdom gained from historical pedagogical practices and remember what they have already learned while accepting technology-driven practices. From Bloom's work in the 1950's, we know students access higher cognitive levels of application, comprehension, and knowledge, when they engage in peer-to-peer learning (Bloom et al., 1956). Learning is taking place in more casual interactions between students as reported by teachers in this study. Student-to-student learning is taking place as they assist each other finding websites, tools, apps, and other supports.

While the Common Core State Standards (CCSS), instructional frameworks, and teacher evaluations were not the primary focus of this research study, they are connected to best practices in teaching and to blended learning, which were the focus of this research (Danielson, 2012; DreamBox, 2014a; Fullan, 2014; Murphy & Regenstein, 2012). Both the online teacher survey and the teacher interviews included questions about CCSS, teaching frameworks, and teacher evaluations, because they are leading topics among educators and they encompass the many challenges educators face in 2014 and beyond. One interview participant stated about CCSS, "The Common Core (CCSS) and technology blend together nicely as we are working towards higher-order thinking." Teachers are being asked or required to demonstrate student growth, and participants in this study utilize the tablets as a tool to demonstrate the work of the students. Using Dropbox or Showbie, participants' students chart and graph their own progress.

Conference time is frequently utilized for elementary students to demonstrate their learning growth throughout the year, though with tablets and digital equipment, students are leading those conferences with a video of their progress. The site district employs Guaranteed Viable Curriculum (GVC) standards and has aligned those to CCSS.

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**Appendix A**

**National Institute for Health Certification**

**Certificate of Completion**

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

Date of Completion: 03/18/2013

Certification Number: 1145235

**Appendix B**

**Washington District Research Approval**

May 24, 2013

Northwest Nazarene University
Attention: HRRC Committee
Helstrom Business Center 1ST floor
623 S University Boulevard
Nampa, Idaho 83686

RE: Research Proposal Site Access for Ms. Cynthia (Cindy) Prouty

Dear HRRC Members:

This letter is to inform the HRRC that Administration at ⬛⬛⬛⬛ Schools has reviewed the proposed dissertation research plan including subjects, intervention, assessment procedures, proposed data and collection procedures, data analysis, and purpose of the study. Ms. Prouty has permission to conduct her research study in the district of and with the students of ⬛⬛⬛⬛ The authorization dates for this research study are July 2013 to April 2014.

Respectfully,

**Appendix C**

**Pew Internet Research Survey Permission**

---

**From:** Pew Internet Information
**Sent:** May 23, 2013 6:46 AM
**To:** 'Cindy Prouty'
**Subject:** RE: Survey permission

Dear Ms. Prouty,

You have the permission of the Pew Research Center's Internet & American Life project to use our questionnaire in your academic work as indicated below in your email. Our citation guidelines may be found here:
http://www.pewresearch.org/about/use-policy/

Thanks so much for taking the time to check with us on the use of our work,
Cornelia


Cornelia Carter-Sykes
Manager, Pew Internet
Pew Research Center
http://www.pewinternet.org

---

**Appendix D**

**ISTE Permission**

The Permissions Company, Inc.
47 Seneca Road
P. O. Box 604
Mount Pocono, PA 18344
570.839.7477 (vox) 570.839.7448 (fax) e-mail: PermDude@eclipse.net

December 11, 2013

Dear Ms Prouty:

Thank you for your email of today, for permission to use the graphic regarding the technology standard for teachers in your doctoral dissertation for Northwest Nazarene University.
This letter will grant you permission to use the material as requested in your dissertation and in all copies to meet university requirements, including University Microfilms edition. You must credit our work as the source of the material, and you must re-apply if your dissertation is later published. The source line you have indicated in your email is fine, but please add "Used by permission" to the end to indicate our approval of the use.

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Carolyn Sykora
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Sincerely,
Frederick T. Courtright, President
The Permissions Company, Inc.
Rights Agency for the International Society for Technology in Education

**Appendix E**

**Danielson Permission**

**From:** Thomas Emerick
**Sent:** Tuesday, January 21, 2014 5:35 PM
**To:** Cindy Prouty

Dear Cindy,

You may reference the Framework in your dissertation, provided that you do not modify any of the language.

Best of luck in your studies.

Kind Regards,
Thomas

**Thomas Emerick**
Director of Operations
The Danielson Group

609.313.4369
emerick@danielsongroup.org
www.danielsongroup.org

**Appendix F**

**Christensen Permission**

12/13/2013
Re: Permission to use graphics

Dear Cindy,

We are delighted to grant permission for you to use graphics and / or text related to blended learning found in blog posts and publications on the Christensen Institute website. In return we require that you cite Clayton Christensen Institute and link to the page where each graphic and / or text entry used is currently located.

With best wishes for your continued success,

Cathleen Calice
Executive Assistant to Michael Horn
Clayton Christensen Institute
2929 Campus Drive, Suite 410
San Mateo, CA 94403-2537
ccalice@christenseninstitute.org
650-887-0788, ext. 0

**Appendix G**

**Collins Permission**

2/3/2014

Hi Cindy,

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Listed below are the requirements we have for dissertations:

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**Appendix G (continued)**

**Collins Permission**

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**Appendix G (continued)**

**Collins Permission**

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We hope these requirements and guidelines will answer your questions about the use of Jim Collins' material in your dissertation and we wish you all the best with your graduate studies.

My best regards,

Torrey

Torrey Udall
Assistant to Strategic Council
The Good to Great Project LLC
Office of Jim Collins
torrey@jimcollins.com
Phone: 303.209.3740
Fax: 303.448.9087
www.jimcollins.com

**Appendix H**

**Ambient Insight Permission**

---

**From**: Cindy Prouty
**Sent**: Monday, January 27, 2014 3:37 PM
**To**: "support@ambientinsight.com" <support@ambientinsight.com>
**Subject**: Re: [Ref #1963] Ambient Insight Support

Hi Cindy. Thanks for your interest in our research. You are welcome to use a graphic from that report. You can also review recent 2011-2016 Overviews and regional Abstracts here:

http://www.ambientinsight.com/Reports/eLearning.aspx

Jim Halliday,
Ambient Insight Communications

**Appendix I**

**NASP Permissions**

Student Engagement Graphic

Re: Permission to use graphics

Hi Cindy,

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You can certainly cite the authors and Chapter 68 of *Best Practices in School Psychology V* 2008 for the content and you will not need written permission for this. However, NASP cannot give you permission to use either the graphics (the one you sent or the one on page 1103), as we do not own them.

I hope this helps.

Denise
Denise F. Ferrenz, CPA
Director of Publications
NASP
4340 East West Hwy. #402
Bethesda, MD 20814
(301) 347-1656- Direct
(301) 657-0275- Fax

## Appendix J

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| Expected completion date | May 2014 |

**Appendix J (continued)**

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## INTRODUCTION

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**Appendix K**

**Partnership for 21st Century Skills Permission**

Thank you Cindy!

Please feel free to use the Framework for 21st Century Learning - all our materials and educator resources are free for educational purposes. Thank you for citing Partnership for 21st Century Skills and linking to our website - www.P21.org.
Let me know if I can be of further assistance!

All the best,

Tatyana


**Tatyana Warrick**
Communications Manager
Partnership for 21st Century Skills
1 Massachusetts Avenue, NW, Suite 700
Washington, DC 20001
Tel: (202) 312-6430
**Please note my new email: tatyana@p21.org**
Twitter: @P21CentSkills
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## Appendix L

## Qualitative Informed Consent

### A. Purpose and Background

Cynthia Prouty, Ed.S., in the Department of Graduate Education at Northwest Nazarene University is conducting a research study related to tablet computing and blended learning in elementary classrooms. We appreciate your involvement in helping us to determine the perceptions of teachers in understanding teacher professional development needs and the impact of blended learning in classrooms.

You are being asked to participate in this study because you are a healthy volunteer, over the age of 18.

### B. Procedures

If you agree to participate in the study, the following will occur:

1. You will be asked to sign an Informed Consent Form, volunteering to participate in the study.
2. You will be asked to provide a set of demographic data.
3. You will be asked to complete two interviews related to your experiences with tablet computing and blended learning in the classroom. The interviews will each take approximately 40 minutes.
4. You will be asked to reply to an email at the conclusion of the study asking you to confirm the accuracy of the data gathered during the interview.

### C. Risks/Discomforts

Some of the questions could make you uncomfortable, but you are free to decline to answer any questions you do not wish to answer or to stop participation at any time.

The researcher will make every effort to protect your confidentiality. However, if you are uncomfortable answering any of these questions, you may leave them blank.

Confidentiality: Participation in research may involve a loss of privacy; however, your records will be handled as confidentially as possible. No individual identities will be used in any reports or publications that may result from this study. All data from notes and disks will be kept in a locked file cabinet in the researcher's home and the key to the cabinet will be kept in a separate location. In compliance with the Federalwide Assurance Code, data from this study will be kept for three years, after which all data from the study will be destroyed (945 CFR 46.117).

**Appendix L**

**Qualitative Informed Consent (continued)**

**D.  Benefits**

The information you provide may help educators to learn more about best practices in blended learning and develop professional development steps for teachers to become more proficient in enhancing tablet computing in their classroom.

**E.  Payments**

A $5.00 coffee card will be provided to participants who complete the survey.

**F.  Questions**

If you have questions or concerns about participation in this study, you should talk first with the investigator. Cynthia Prouty can be contacted via email cprouty@nnu.edu or ▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮ or via phone ▮▮▮▮▮▮▮▮. If for some reason you do not wish to do this, you may contact Dr. Loredana Werth, ▮▮▮▮▮▮▮, Program Administrator at Northwest Nazarene University.

Should you feel distressed due to participation in this study, you should contact your health care provider.

**G.  Consent**

You will be given a copy of this consent form to keep.

**Participation in research is voluntary**. You are free to decline to be in this study, or to withdraw from participation at any point. This research study has been approved by the Northwest Nazarene University Human Research Review Committee in June 2013, approval #3062013.

*I give my consent to participate in this study:*

_____         _____

**Signature of Study Participant**                                                    **Date**

*I give my consent for the interview to be audio taped in this study:*

_____         _____

**Signature of Study Participant**                                                    **Date**

**Appendix L**

**Qualitative Informed Consent (continued)**

*I give my consent for direct quotes to be used in this study. No personal identifying information will be used in the report from this study:*

_____          _____

**Signature of Study Participant**                                    **Date**

_____          _____

**Signature of Person Obtaining Consent**                        **Date**

**THE NORTHWEST NAZARENE UNIVERSITY HUMAN RESEARCH REVIEW COMMITTEE HAS REVIEWED THIS PROJECT FOR THE PROTECTION OF HUMAN PARTICIPANTS IN RESEARCH**

**Appendix M**

**Verbatim Telephone Script**

Hello, my name is Cindy Prouty and I am a doctoral student at Northwest Nazarene University. Do you remember recently filling out a survey online about your work with blended learning? On that survey, you indicated that you would be willing to participate in an interview. The interview will require that we meet twice for approximately 40 minutes each time.

Is this a good time to visit about setting up a time for the interview?

If yes, proceed.

If no, is there a time that would be better to call again? Thank you for your time. I will call back at our appointed time.

Thank you for agreeing to be a part of this study. Before I can conduct the interview I will need for you to sign the Informed Consent Form.

I will email you an Informed Consent Form for your signature. After you have signed the form you can scan the form and email it to me at cprouty@nnu.edu, or you can mail it to me at █████ ██████████████████████████.

After I have received the Informed Consent Form, I will call you back to set up a time for our interview.

Do you have any questions for me?

Thank you so much for your willingness to be a part of this study. I will talk to you soon. Thanks again.

**Appendix N**

**Pre-survey Questions**

Dear Teacher:

Hello! My name is Cindy Prouty and I am currently a doctoral student at Northwest Nazarene University in Nampa, Idaho. I am working on my dissertation and am hoping you will participate in this study.

The purpose of this research is to understand how the use of tablets impact elementary students and the different methods teachers are using tablets in their instruction. All the data received will be anonymous. By completing this pre-survey you are providing your consent to use the information for this study. Results will be reported in the aggregate and no responses will be attributed to any individual. By continuing, you are providing consent to take part in this study.

Please feel free to contact me at any time with questions you may have, cprouty@nnu.edu. This is a voluntary survey, if you do not feel comfortable with any of the items, you may leave them blank. You may stop the pre-survey at any time if you have any concerns.

| **1. Are you familiar with the term blended learning?** | **Yes        No** |
|---|---|
| If yes, what is your definition? | |
| **2. Are you acquainted with blended learning terminology and models?** | **Yes        No** |
| If yes, please list any terminology and models you typically associate with blended learning. | |

**Appendix O**

**Quantitative/Qualitative Online Teacher Survey**

Hello! My name is Cindy Prouty and I am currently a doctoral student at Northwest Nazarene University in Nampa, Idaho. I am working on my dissertation and am hoping you will participate in this study.

The purpose of this research is to understand how the use of tablets is impacting elementary students and the different methods teachers are using touch tablets in their instruction. All the data received will be anonymous. By completing this survey you are providing your consent to use the information for this study. Results will be reported in the aggregate and no responses will be attributed to any individual. Some questions will have a textbox in which you can type your answer. Once you submit your survey, you will not be able to log back in. The survey should take about 15 minutes to complete. By continuing to the next page, you are providing consent to take part in this study.

Please feel free to contact me at any time with questions you may have. You may email me at cprouty@nnu.edu or ███████████.

This is a voluntary survey, if you do not feel comfortable with any of the items, you may leave them blank. You may stop the survey at any time if you have any concerns.

Please select from the drop-down menu below

1. What is your age group? 20-29, 30-39, 40-49, 50-59, 60-69, 70+
2. How many years have you been teaching? <2 yrs, 3-5 yrs, 6-10 yrs, 11-15 yrs, 16 yrs or more
3. Would you describe the students you teach as: mostly upper or upper middle income, mostly middle income, mostly lower middle income, mostly low income?
4. With the new teacher evaluation system being implemented, a rubric will be utilized: 1 = not proficient, 2 = needs improvement, 3 = meets standard, and 4 = exceeds standard. How would you rate yourself in terms of tablet technology usage in the classroom? (1-4)
5. When it comes to using digital technology (such as Internet, tablets, laptops, etc.) do you usually know more than your students? (Always, sometimes, we know about the same, no, my students seem to know more than I do about tablets and other devices).
6. What is the desired ratio of tablets in your classroom? (one tablet per class, one tablet per small group, 1 tablet for every two students, or 1-to-1 tablets).

**Appendix O**

**Quantitative/Qualitative Online Teacher Survey (continued)**

| Likert Questions | 1<br>Strongly<br>Disagree | 2<br>Disagree | 3<br>Neutral | 4<br>Agree | 5<br>Strongly<br>Agree |
|---|---|---|---|---|---|
| Do you think the use of tablets is narrowing the gap between the most and least academically successful students? | | | | | |
| Do you have your students use the computer lab? | | | | | |
| Do you have your students use tablets from a mobile cart? | | | | | |
| Do your students use tablets from the mobile cart more than once per month? | | | | | |
| Do your students use the tablet mobile cart more than once per week? | | | | | |
| Do your students appear to be more engaged in the instruction when utilizing a tablet than with traditional methods/materials? | | | | | |
| Do you utilize your classroom tablets on a monthly basis? | | | | | |
| Do you utilize your classroom tablets on weekly basis? | | | | | |
| Do you utilize your classroom tablets on daily basis? | | | | | |
| Do you find that discipline or behavioral challenges decrease when tablets are being utilized? | | | | | |
| Have you observed better attendance when students know in advance they will be working with the tablets? | | | | | |
| Do your students have assignments that require online access as a part of their homework? | | | | | |
| Are you a part of a networking system (formal or informal) that shares sites, web tools, apps or other learning tools? | | | | | |

**Appendix O**

**Quantitative/Qualitative Online Teacher Survey (continued)**

| Likert Questions | 1 Strongly Disagree | 2 Disagree | 3 Neutral | 4 Agree | 5 Strongly Agree |
|---|---|---|---|---|---|
| Would you say the impact of the Internet on students' research habits has been mostly positive? | | | | | |
| How likely are you to seek professional development opportunities involving digital technologies (laptop, web tools, apps, tablets) | | | | | |
| How likely are you to seek professional development opportunities specifically for tablet usage? | | | | | |
| How interested are you in increasing your digital technology skills? | | | | | |

Please answer the following questions:
1. What methods (face-to-face, hands-on training, webinars, video training modules, etc) of professional development would be most helpful to you?
2. What comments or suggestions do you have to improve the facilitation of technology in your district?
3. What is most challenging about incorporating digital technologies and digital learning into your classroom pedagogy?
4. Comments/Feedback

I am seeking individuals who are interested and willing to participate in an interview regarding your experiences integrating technology into the classroom. If you are interested, please provide your name and contact information in the space provided. The interviews will require approximately 40 minutes of your time.


Name_____

Email Address_____

Phone_____


Thank you for taking your time to advance digital technology research in classrooms. Please contact me at cprouty@nnu.edu if you have any questions.

**Appendix P**

**Qualitative Interview Questions #1**

<u>Interview #1</u>

The term blended learning in the context of this K-5 study means utilizing different technology devices as a means to enhance teaching (Christensen, Horn, & Staker, 2013; Horn & Staker, 2012; Pointek, 2013b).

1. Tell me about your background and professional development related to integrating blended learning in the classroom?

2. In your own words, describe effective tablet technology integration tools and strategies you employ with your class?

3. How do you incorporate technology into your classroom?

4. How are you using tablets in your classroom?

5. Do you find tablet usage beneficial with your students? If yes, how so?

6. What type of support do you need or would be helpful in order to effectively teach in a blended learning technology rich classroom?

7. Do you think incorporating technology in your classroom has improved the motivation of your students? If yes, how so?

8. What types of changes have you seen in attendance or disciplinary referrals in the blended learning technology rich classroom?

9. What strategies have you tried to engage your students when you are teaching in the blended learning environment?

10. How has blended learning changed how you teach and how has blended learning changed how you see yourself as a teacher?

**Appendix Q**

**Qualitative Interview Questions #2**

Interview #2

1. In what ways do you team with others to find effective blended learning tools and strategies?

2. What do you see as challenges to effective blended learning implementation? What professional development needs do you have or opportunities would you like to see in terms of blended learning in your:

   a) Building?

   b) District?

3. With the new teacher evaluation system being implemented, are your teaching practices changing? How?

4. Charlotte Danielson's instructional framework has been adopted by your school district. In what way do you include that framework in your teaching practice?

5. Common Core State Standards (CCSS) have been adopted and are being implemented in the 2013-2014 school year. In regards to blended learning, are your teaching practices changing? How?

6. Which methods of technology implementation have you tried and have been the most successful in your classroom?

7. Do you have further information you would like to share about your teaching practices or successful technology implementation at the elementary-school level?

**Appendix R**

**Classroom Observation On-Task Data Collection**

Teacher Code _____          Grade Level _____

Date of Observation _____          Number of Students Present _____

Instructional Topic_____          Tablet Method_____

| **Start/Stop time** | **5 Minute Intervals** | **On-Task** | **Not On-Task)** |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

Notes to indicate any irregularities/drills/unexpected disruption:

**Appendix S**

**Debrief Statement for Qualitative Interviews**

Thank you for participating in this study. The goal of this study is to determine teacher perceptions of blended learning practices and student engagement. I hope that this study can help other schools define best practices for blended learning and determine professional development strategies for teachers.

After I have had a chance to analyze the data, I will email you the results and ask for feedback. The purpose of this communication is to ensure that I have captured our discussions accurately and portrayed your thoughts properly.

If you have any questions or concerns, Cindy Prouty can be contacted by phone ▮▮▮▮▮▮▮▮ or email at cprouty@nnu.edu.

Thank you for your participation.

**Appendix T**

**Verbatim Instructions for Interviews**

Hi _____

Thank you for participating in this study, I truly appreciate it.

**Semi-Structured, Audio-Recorded Interviews**

Two semi-structured, audio-recorded interviews will be conducted with each participant. The interviews will be completed at a public location mutually decided by the participant and investigator. Each interview will take approximately 40 minutes.

This process is completely voluntary and you can select to leave the study at any time. If you feel uncomfortable with any question you can select not to answer that question.

Do you have any questions for me?

Thank you for participating.

**Appendix U**

**Class Observations Announcement to Parents**

Dear Elementary School Parents –

My name is Cynthia Prouty, doctoral student in the Department of Graduate Education at Northwest Nazarene University.

As a part of my research on blended learning and tablet technology, I will be observing in approximately 10 classrooms in October. There will be no student interaction, pictures or video taken of any children or classroom. Observations will only occur during the regular school day with a district staff member leading the class. These observations are related to helping the elementary school and teachers understand how often students are engaged in the classroom with some of the new iPad technology that has become available.

Do not hesitate to contact me with questions. Thank you.


Cindy Prouty
Doctoral Student
Northwest Nazarene University
Email: cprouty@nnu.edu
Telephone: ▮▮▮▮▮▮▮▮

**Appendix V**

**Member CheckingEmail**

Dear Teacher,

Thank you for your participation in the study entitled *Student Engagement: Best Practices in a K-5 Blended Learning Environment.* Themes that resulted from the presurvey, online survey, interviews, and classroom observational data in your building is summarized below. Please let me know if these accurately represent our collaboration. If you have any suggestions, modifications, or questions, please contact me.

The purpose of this study was to explore student engagement and look at best practices in a blended learning classroom. The research questions in this study were :
1. What tablet methodology supports best practices in a K-5 blended learning environment?
2. How does tablet use impact student engagement?
3. With an increase in the use of tablets in classrooms, what are teacher perceptions of professional development and needs?

All full-time certificated staff participated in both the presurvey and the electronic survey. Additionally, some participants volunteered for me to observe in their classroom, and others volunteered for the interviews.

In the presurvey, 90% of staff were unfamiliar with blended learning, and 100% of teachers were not familiar with terminiology or models associated with blended learning. The classroom observations yielded a significant difference in classrooms with either one tablet per student and two students per tablet when compared to those classrooms with less than 10 tablets. In other words, more students were observed to be on task in the classrooms with more tablets.

Online survey results indicated that the most preferred method of professional development was hands-on training. Second was face-to-face, and thirdly, collaborative professional development. The overarching theme for the qualitative portion of the survey, was the improvement of the facilitation of technology. Sub themes were: professional development, district-level technology supports, and resources.

The top ten frequency themes from the interview data included: incorporation of tablets into the classroom, utilization of apps for content areas, technology use in the classroom, professional development needs (tablets, technology), collaboration with peers/other teachers, differentiation of instruction for students, engagement of students in the material, increase in student motivation during tablet use, blended learning terminology, and integration of technology into instruction.

If you would like further information, please email or contact me. I plan to present this information to building staff in June, 2014. Thank you again for your participation in my research!

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