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A Study of the Application of a Bring Your Own Device Strategy in an Elementary School

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This is to certify that the doctoral dissertation by

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Walden University
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Abstract

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MA, University of Pittsburgh, 1979

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Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Education and Leadership

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Abstract

Numerous studies have been published on the efficacy of a Bring Your Own Device (BYOD) Acceptable Use Policy (AUP) at the U.S. secondary and postsecondary school levels to increase student access to technology. However, there is a lack of data on the efficacy of a BYOD AUP to increase elementary student technology access. The purpose of this descriptive case study was to determine if a BYOD AUP at the U.S. K-5 level would increase students' access to technology as necessitated by the implementation of the Common Core State Standards (CCSS). This study was grounded in social transmission and transformative theories. The phenomenon of a northwest suburban elementary school BYOD implementation was examined by documenting the perceptions, attitudes, beliefs, lived experiences, and practices of administrators and teachers. This study used interview and classroom observation of a purposive selection of 3 elementary educators, the principal, and superintendent. Coding of data according to key words lead to analysis according to nodes and themes. Triangulation of multiple data sources and member checking helped to establish the credibility of data. Study findings documented increased access to technology for elementary students, best practices and steps to implementation. Study recommendations for elementary educators and administrators considering BYOD include consensus building, AUP, technology infrastructure, communications, professional development, classroom management, and lesson design to inform the field on elementary BYOD. Study findings facilitate social change by providing BYOD implementation recommendations, increasing elementary student access to technology at a reduced cost to districts and schools.

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Dedication

For Ken, my husband, lover of my soul, whose love is my most precious gift.

For Mummie, whose love made me who I am.

For Daddy who always told me I would be a great teacher!

For Erin, my daughter, light of my life.

For my grand-daughter Sierra my inspiration to make the world a little better for your future!

For my students, from whom I have learned so much,

I speak for you and I love you!

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Your love is the foundation of every victory and accomplishment. I wake up laughing and go to sleep laughing. You are husband of the year, every year in my eyes and in my heart

To my daughter Erin, the light and pride of my life, who's so very lovely inside and out, you have always been my dearest friend. You never failed to ask me how I was and took the time to listen to me talk about my progress. I want you to know how much your reassurance and encouragement meant. You know just the right thing to say to keep me going. I will not forget the many dinners you made, especially your yummy lasagna and the thoughtful texts in the middle of the night, thoughtful gifts and the hugs. You have made me so very proud and I am honored to be your momma.

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taught me how to be an administrator and whose expertise I have used during my tenure there and throughout the course of my studies. You trusted and supported me to administer grants, develop programs and train teachers across the state. Your generosity of time and knowledge will never be forgotten. You worked tirelessly to provide the resources to make things happen! Together we were a team and provided technology resources that changed lives!

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Ghandi said, “Be the change you want to see in the world”. We are the change. I will continue to use what I learned from you all as I pursue the next steps.

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Chapter 1: Introduction to the Study

Background

The use of mobile devices and the Internet provide increased opportunities for student acquisition of 21st century learning skills, as outlined in the Common Core State Standards Initiative (CCSS). The *CCSS English Language Arts Standards Introduction, Students Who are College and Career Ready in Reading, Writing, Speaking, Listening and Language* reveals the following expectations for students:

> They use technology and digital media strategically and capably. Students employ technology thoughtfully to enhance their reading, writing, speaking, listening, and language use. They tailor their searches online to acquire useful information efficiently, and they integrate what they learn using technology with what they learn offline. They are familiar with the strengths and limitations of various technological tools and mediums and can select and use those best suited to their communication goals. (National Governors Association Center for Best Practices, Council of Chief State School Officers, 2010, para. 7).

The International Society for Technology in Education (ISTE) has published ISTE Standards that cover technology implementation expectations for administrators, educators, students, and coaches. These opportunities to teach and learn according to the CCSS and ISTE Standards are delivered through technology-infused, learner-centered classrooms where experiential learning is at the core (Lai,Yang, Chen, Ho, & Chan, 2007) and problem- or inquiry-based learning is the focus (Lan, Sung, Tan, Lin, & Chang, 2010; Looi et al., 2011).

According to scholarly peer reviewed literature, educators may employ a variety of effective instructional techniques and resources for implementing and managing student use of technology in the classroom to facilitate higher order thinking, collaborative and experiential learning. Green, Brown, and Robison (2008) outlined many instructional techniques for the effective student use of technology including the facilitation of student research; networking, collaboration, and presentations. The use of these instructional techniques to facilitate 21st century learning via mobile devices is also well documented in the literature (An & Reigeluth, 2012; Andone, Dron, & Pemberton, 2009; Brown & Green, 2007; Casey & Evans, 2011; Cavanaugh, Dawson, & Ritzhaupt, 2011; Duke, 2008; Liu & Kao, 2007; Obringer & Coffey, 2007). These studies support the need for the effective use of technology by students in the elementary classroom to facilitate 21st century student learning and the need for access to digital research and multi-media resources to support m-learning.

A variety of mobile devices can potentially be used to support m-learning of the CCSS including cell phones, smartphones, laptops, net books, iPads, iPods, iPhones, and other handheld devices for example Kindles and eBook readers. While there are a variety of devices that could potentially support instruction and learning of the CCSS, school districts, and state departments of education struggle to make 1:1, or even 1:2 device deployment a reality, due to prohibitive costs and reductions in funding. The perceived urgency in providing student access to mobile technology fueled by the efforts to align instruction according to the CCSS and ISTE standards and the lack of funding for mobile devices inherent across all educational institutions, has led to the consideration of the

revision of current school district Acceptable Use Policies (AUP) that will facilitate student and educator BYOD across K-12.

There is a contrast between mobile device access and use at home by students and mobile device access and use at school. According to the Pew Internet in American Life Project (as cited in Lenhart, Purcell, Smith, & Zickuhr, 2010), the majority (75 %) of 12 - 18-year-old students own their own cell phones, while 65 % of U.S. schools ban their use. The most recent Pew research (as cited in Madden, Lenhart, Maeve Duggan, Cortesi, & Gasser, 2013) found that approximately three out of four or 74 % of teens ages 12-17 are mobile Internet users who are accessing the Internet through a variety of mobile devices for example cell phones and tablets. In addition, teen smartphone ownership in that same age group is now at 37 % up from 23 % in 2011. In another PEW Internet and the American Life Project (2013) study, 25 % of teens ages 12-17 use their cell phones or smartphones as their primary method to access the Internet. Fifty percent of teen Smartphone owners (37% of all teens) access the Internet primarily via their smartphones. There is a significant population of teens with either Smartphone or cell phones who use them to primarily access the Internet.

Several studies indicated students in Grades 3-12 have access to mobile devices like cell phones. In a study by Englander (2011), 20,766 Massachusetts students were given a self-reporting survey in Grades 3-12. Englander indicated that by Grade 3, 18-20 % of children reported that they have their own cell phones, by Grade 4 25-26 % have their own cell phones, and by Grade 5 39 % have their own cell phones. By third grade 90 % of students reported that they are using the Internet (Englander, 2011). By middle

school 89 % of the students reported that they have their own cell phones (Englander, 2011). The majority of elementary students use the Internet, and a high percentage already own their own cell phones. This report advised school districts to consider BYOD policies and to improve instruction in cyberbullying and digital citizenship.

While there is a significant body of research on 1:1 laptop initiatives (Dexter, Donovan, & Green, 2010; Dunleavy & Heinecke, 2007) and netbook use (Collins et al., 2010), there is little published scholarly work in terms of BYOD. Literature searches for scholarly, peer-reviewed research on Bring Your Own Device or BYOD, Bring Your Own Technology or BYOT spanning a 5-year period was conducted and included the Walden Library education data bases and Google Scholar. For a full description of the literature search strategies employed see Chapter 2.

BYOD policy is increasingly popular in the business world. According to InfoWorld, mobile and BYOD as cited in (Gruman, 2012) in the domestic and international business community has embraced the BYOD policy with businesses across the United States and globe allowing, and at times requiring, their employees to bring their own smart phones, tablets, iPads, lap tops, or other devices. Some companies and government institutions provide reimbursements for data plans.

While research demonstrates that BYOD policies are being increasingly instituted in business, globally in K-12 schools (Faulkner, Pegrum, & Oakley, 2013) postgraduate education, U.S. postsecondary classrooms, and to a lesser degree by high schools across the United States, there is only one published scholarly research journal article on BYOD policy and practice at the elementary school level Song (2014). Song presented findings

on student perceptions in a single elementary classroom in Hong Kong. Song demonstrated that students, using BYOD, increased positive attitudes towards learning and increased their understanding of the anatomy of fish compared to when the textbook was used. Song (2014) found BYOD was not only a feasible instructional practice for elementary science students it leads to increased levels of understanding and positive attitudes.

A literature search yielded four recent dissertations on the topic of BYOD. Three of these dissertations focused on BYOD at the middle and high school levels, and one dissertation presented findings at the K-8 level. Phillips (2015) explored the perceptions and lived experiences of rural high school faculty members in year 2 of the implementation of BYOD policy. It included the purposeful selection of seven participants including the principal, counselor, media specialist, and four teachers. They were given open-ended, semistructured interviews, wrote in participant journals, and participated in focus group discussions. The themes identified in the study included a lack of preparation, classroom management difficulties, adapting, and recommendations for implementation. There was inadequate faculty preparation during the first year of mandatory implementation. The second year policy was adjusted and BYOD was not mandatory, and this empowered the participants to gradually implement BYOD.

Ross (2013) studied the level of BYOD use by teachers at a suburban high school in the third year of BYOD implementation. Interviews were conducted on two to three teachers from each academic department, and classroom observations were also conducted. The study findings included veteran and new teacher instructional decisions,

collaboration on BYOD with colleagues, and participation in professional development. Findings included teachers' perceptions on barriers to successful implementation including time, equity, access to technology, and behavior of students. Teachers made instructional decisions based on level of use and did not participate in professional development specific to BYOD; they worked with colleagues. The best indicator of successful BYOD implementation in the classroom was the teachers' technology experience and use of student-centered learning strategies.

Thibodeaux (2014) surveyed junior and senior high school teachers in a small southern school district on their perceptions of the advantages and disadvantages of the complexity and compatibility of BYOD. Thibodeaux indicated that 64 % of the teachers reported motivation, engagement, and technology were BYOD strategy advantages, and 52 % were in agreement stating that student achievement was another advantage. The biggest disadvantage reported was lack of uniform access to devices. Educators reported on best practices, but stated that they needed more time to implement BYOD. Teachers recommended limited classroom use and definitive guidelines and emphasized the importance of classroom management and monitoring student use. Teacher experience and age did not seem to effect implementation, and teachers agreed that BYOD policy should not be mandatory.

Otstot (2015) explored the influence of a staff development program for elementary teachers. Otstot designed a professional development apprenticeship model of teacher collaboration to implement BYOD at a K-8 school. Barriers to implementation included support, time, resources, and professional development. Participants completed

questionnaires; engaged in collaborative planning time, weekly reflections, and descriptions; completed surveys; and participated in semistructured interviews. This collaborative apprenticeship approach was successful in eliminating perceived barriers and facilitated BYOD use as an instructional tool.

Summary

The literature review revealed a gap in knowledge as there were no published peer-reviewed journal articles and no dissertations on the perceptions, attitudes, and beliefs of administrators and teachers regarding the advantages and limitations of an established BYOD policy at the elementary school level in the United States. Furthermore, there was a gap in the scholarly peer-reviewed literature on the exploration of elementary school implementation of BYOD practices including school and district adoption of AUP for implementation of BYOD, the technology infrastructure necessary for BYOD implementation at the elementary school and district levels, and the exploration of virtual forms of community communication and district professional development delivery on BYOD. A gap in the knowledge also existed in the study of instructional design and lesson delivery using BYOD for facilitating mastery of CCSS based 21st-century skills in the elementary classroom. Finally, there was a gap in the literature on BYOD classroom management including student behavior management and device management practices. This study attempted to provide findings to fill these gaps.

The CCSS is a state-led initiative to develop common standards across U.S. state boundaries. According to the CCSS Key Points on English language arts in the area of media and technology, integration of technology is a key element. According to the

CCSS, "Just as media and technology are integrated in school and life in the twenty-first century, skills related to media use (both critical analysis and production of media) are integrated throughout the standards" (National Governors Association Center for Best Practices, Council of Chief State School Officers 2012, para.12). Design and delivery of educational opportunities for media and technology integration to facilitate student acquisition of 21st century and college and career ready workforce skills will be the focus of elementary educators as they begin to implement the CCSS. Integration of media and technology into teaching and learning, and curriculum development through the implementation of the CCSS. This will require schools and districts to provide increased elementary student access to mobile devices.

In order to prepare students to be college and career ready by graduation from high school students across the K-12 across the U.S. are increasingly required to use technology and are taught according to the CCSS which integrate technology skills across content areas. According to the National Governors Association Center for Best Practices, Council of Chief State School Officers English Language Arts Standards Introduction (2010),

> Students who are college and career ready in reading, writing, speaking, listening, and language use technology and digital media strategically and capably. Students employ technology thoughtfully to enhance their reading, writing, speaking, listening, and language use. They tailor their searches online to acquire useful information efficiently, and they integrate what they learn using technology with what they learn offline. They are familiar with the strengths and limitations of

> various technological tools and mediums and can select and use those best suited to their communication goals. (para.7)

Elementary students will be required to work on mobile devices with digital tools and media delivered via Web 2.0 tools, digital texts, and the cloud online across all subject areas according to CCSS. Access to digital tools and media can only be provided via increased access to mobile devices and the Internet in the elementary school setting. According to the National Governors Association Center for Best Practices, Council of Chief State School Officers (2010), "students use technology, including the Internet, to produce and publish writing and to interact and collaborate with others…gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information" (National Governors Association Center for Best Practices, Council of Chief State School Officers, 2010, para. 7-8). U.S. educators are increasingly aligning lessons and assessments to CCSS English Language Arts anchor standards for college and career readiness in writing that necessitate the student use of technology.

These CCSS standards all point to an increase in the need for elementary student access to the Internet and mobile devices to facilitate interaction, collaboration, research, student publications, use of digital sources and media, and creation of data displays, and presentations. The key design considerations of the CCSS revolve around media consumption, and production (National Governors Association Center for Best Practices, Council of Chief State School Officers, 2010). According to the CCSS (2010) educators are preparing students for a technological society and workforce. In order to prepare for

the future, the standards are embedded throughout content areas in media and research skills. Students need to conduct original research to solve problems or answer critical questions. They need to be able to gather and comprehend information by using digital tools and Internet resources. Through the use of higher order thinking skills students are required to select, evaluate, site sources, make inferences, synthesize information and analyze data. Students need to be able to produce presentations and reports using a variety of technology tools. Students should be skillful in the use of technology to collaborate and interact. (National Governors Association Center for Best Practices, Council of Chief State School Officers, 2010, para. 6). The key design considerations of all of these CCSS-embedded skills require access for elementary students to mobile devices throughout their school day to embed media and integrate the teaching and learning of these skills into the curriculum.

The CCSS integration of media and technology into the curriculum requires schools, districts, and states to consider increased elementary student access to mobile devices and will also facilitate teaching and learning according to standards developed by the International Society for Technology in Education (ISTE). ISTE developed the National Educational Technology Standards (NETS), now referred to as ISTE Standards, through the input of educators in 40 countries to provide international standards to facilitate teaching and learning in an increasingly technological society. The ISTE Standards were adopted by many U.S. schools and districts and internationally as frameworks for learning and teaching in a digital age by countries including Australia, Norway, Japan, Australia, and the Philippines. The ISTE standards are a set of standards

for various stakeholder groups including ISTE Standards Students, ISTE Standards Teachers, ISTE Standards Coaches, ISTE Standards Administrators, and ISTE Standards Computer Science Educators. They were written to promote best practices in instructional design, teaching and higher order critical thinking and learning by students in the area of technology. ISTE Standards for students emphasize the use of technology to promote creativity and innovation, communication and collaboration, research and information fluency, critical thinking, problem solving and decision making (ISTE, 2015, para. 1-4)

Teaching and learning, according to the CCSS and ISTE Standards, require states, districts, and schools to provide elementary students with increased access to the Internet and use of mobile technology and digital tools during instruction and learning that is fully integrated into the curriculum and not an isolated technology content area subject. This access will facilitate collaboration, research, critical thinking skills, and project-based learning through integration of technology into the curriculum (ISTE, 2015). States, districts, and schools must make decisions on how best to provide increased mobile device technology access, use, and integration in the elementary school setting.

Many U.S. elementary schools do not have enough devices to provide adequate access for students to mobile technologies and the Internet to facilitate learning CCSS and ISTE Standards skills. During difficult economic times, there has been a reduction in federal, state, and district funding previously used to provide mobile devices for students. Schools and districts are now struggling to meet an increased demand to provide devices to students with decreased funding. BYOD policy may increase the number of students who can access and integrate technology across content areas, according to the CCSS and

ISTE Standards, as students who have their own devices can use them throughout the school day (ISTE, 2015). Remaining available funds for purchasing mobile devices may be more effectively used to meet a reduced demand as the percentage of BYOD increases and fewer students need devices purchased by the school district.

There are two alternatives to adopting a BYOD policy at the elementary level. Elementary school districts can continue to restrict student mobile device use to district-owned devices. Without an influx of funding, the ratio of devices to students will remain low. Students will continue to use devices in computer labs, on carts, scheduled according to availability not according to student need, sporadically, or not at all. The second option is for school districts or state departments of education to purchase enough devices for all elementary students to have access throughout the school day to be used as an integrated tool. An example of this policy is the statewide 1:1 initiative adopted by the Maine State Department of Education for high school students. A universal national and state 1:1 mobile device implementation is unlikely in the near future given the limited availability of funds to initiate wide scale implementation at the high school level and even more unlikely at the elementary level. Without a BYOD policy, elementary student access to mobile devices will be limited or nonexistent in most elementary schools and not conducive to learning according to the CCSS and ISTE Standards.

Problem Statement

There is a gap in peer-reviewed literature on teacher and administrator perceptions of and experiences implementing a BYOD policy at the elementary U.S. level to determine if it is a feasible option in meeting the need to provide increased

access, use, and integration of technology to implement 21st century learning, ISTE Standards and the CCSS.

BYOD implementation has met with resistance across all stakeholder groups K-12 and particularly at the elementary level including educator, administrator, school board, the public, and parents reflecting concerns regarding device management, digital citizenship and bullying, Internet safety, equity, provision of grade-level appropriate instruction, and liability for lost or stolen devices.

Purpose of the Study

The purpose of this descriptive case study was to provide insight into the phenomena of a suburban elementary deployment and implementation of a BYOD policy. I attempted to provide insights into the limitations and advantages of BYOD including a stakeholder ecological analysis that recorded and analyzed data through district and site document literature review, a survey of the teaching staff at the site, individual interviews, and observations. I documented the administrator and educator practices, perceptions, and attitudes towards the phenomena of BYOD at this site. The site selected for this study was a suburban elementary K-5 school in the Pacific Northwest that had adopted a school-wide BYOD policy and implementation. This site implemented a BYOD policy 2 years ago during the 2011-2012 school year so they are in their third year of implementation. The continued support of the administrators, teachers, and community, along with the participation by students in the BYOD policy, is evidence of some measure of success as perceived and practiced by these active participants. In my capacity as a state administrator, I had an opportunity to observe this elementary school's

efforts to implement a BYOD policy first hand and the strategies they have employed appear to be successful as it has been supported by administration and accepted by all stakeholders including the staff and community.

A comprehensive literature review included documents that provide evidence of the technology infrastructure, policy, procedures, implementation, support, and professional development activities at this Pacific Northwest suburban elementary school. The principal indicated that there are no "official" documents that the school uses to communicate the BYOD policy other than the AUP published August of 2014 by the district and posted online. This site uses a citizenship program called Love and Logic, and it is through this program that students are taught how to care for all materials brought to school. Through interview and observation, a thorough description of the school's policies and programs became evident.

Research Questions

The main question of this research, directly aligned to the problem statement, was the following, How does the phenomenon of a BYOD policy instituted at one northwest suburban U.S. elementary school site meet the need to provide increased access, use, and integration of mobile technology aligned to the CCSS and ISTE Standards? This question led to the development of these subquestions.

- What are the district and site administrator's perceptions of and attitudes towards BYOD?
- What are the educators' perceptions of and attitudes towards BYOD?

- What BYOD classroom management and instructional techniques are used?
- How are the students using BYOD?

Conceptual Framework

This study was grounded in Dewey's social transmission theory (1916) and Freire's transformative theory (1980, 1994). I considered these theories throughout the design, implementation, data collection, and analysis phases of the study. In the social transmission theory, Dewey (1916) promoted the importance of a collaborative learning environment. In this study, I addressed the goal of creating a collaborative learning environment. BYOD has the potential to increase opportunities for both face-to-face (FTF) and virtual student collaboration through increased access to technology. Increased student access to the Internet allows for increased opportunities to access K-12 social networking and collaboration tools for example Edmodo, Skype, Google docs, and other web 2.0 tools. BYOD has the potential to increase student opportunities to collaborate on social networking, geocaching, video production, blogging, gaming, and providing a forum for collaborative research for project-based, experiential learning in the elementary classroom.

Dewey (1916) stated, a societal flaw is to separate the classes educationally and it is imperative intellectual opportunities be made available to all or society will be overcome by changes that its citizens do not understand. Dewey proposed that a true democracy exhibits the following qualities: a commitment to education, associated living, shared communications, concerns and experiences, and a respect for and promotion of the

diversity of personal abilities, beliefs, and desires. In this study, I addressed these measures of a true democracy with its concomitant shared communications, concerns, and experiences through studying the effectiveness of BYOD in providing improved equality of access to technology tools to facilitate these elements in the elementary classroom.

According to the transformative theory, Freire (1980, 1994) encouraged all educators to reflect and self-examine their own instructional practices to ascertain their ultimate influence upon the developing minds of students. Freire asserted in these acts the teacher advances the cause of the oppressed. In this study, I facilitated educator self-reflection upon the implementation of BYOD policies across K-5 classrooms and examined BYOD from the teachers' and administrators' perspectives.

In the transformative theory, Friere (1980, 1994)) proposed that the role of educators should change from the top down dissemination of knowledge to a continual and mutual exchanging of roles with students learning with and from them. BYOD may afford all K-12 students the opportunity to participate in their own acquisition of knowledge and skills and opportunities for reflection on practices. Through increased access to technology, K-12 students may increasingly exchange roles, with educators acting as the facilitators, not just disseminators of knowledge. In this study, I examined educator participant reflection on this process. Friere's focus is on the reciprocal power of discourse to empower the individual and BYOD's potential capacity to facilitate that discourse was one focus of this study.

Dewey (1819) recognized that shared decision making has systemic society-wide implications that include economic, cultural, political, and educational effects. Collaboration is at the core of a decentralization of power, and both collaboration and a decentralization of power are two of the many desired outcomes of shared decision making (Dewey, 1819). This study provided insight into the adoption of BYOD that represents this shared decision making between administration, educators, and parents in action.

In the social transmission theory and the transformative theory, Friere (1980, 1994) and Dewey (1819) supported the importance of equity in access to technology and infrastructure along with the importance of the infusion of technology into education. These theories were considered throughout this study in the integration of BYOD and to measure how it may help educators to ensure equal access to technology for all students leading to equity in education. Friere and Horton (1990) proposed that the purpose of developing educational pedagogy is not to create programs and materials but to, in the end, create social justice. This study of BYOD began with this social justice end in mind for all elementary students who would benefit from bridging the gap in technology use and increased technology access for all.

Nature of the Study

This nature of this study is a qualitative descriptive case study. According to Yin (2011), during the course of a qualitative case study, the "case" is the unit of analysis and is determined by the research question/s. Yin further explained that in a study, data collection and interpretation captures the uniqueness of the events. This study included

the development of a case intended to provide insight into the phenomenon of BYOD in a suburban elementary school. The boundaries for this study were time, location, and participant sample. The study was restricted to the implementation of BYOD at one suburban Pacific Northwest elementary school; thus, the study was bounded by location. It was bounded by time during the period concurrent to the study, survey, interview, observation, and data analysis dates. It was also bounded by the selection procedure that was a self-selected purposive sample of participants including three educators, one site administrator (principal), and one district administrator (superintendent). The qualitative method is characterized by the collection of multiple sources of data from participants including interview, observation, survey, collection of documents, field journaling, and self-reflection by the researcher.

The descriptive case study method was chosen because it gave the stakeholders a voice through interview and observation. It provided an iterative process that allowed for an unfolding of branching data derived from multiple sources. Unlike quantitative research with its focus on hypothesis testing that leads to a linear design and results, qualitative research allows for an ecological study design aligned to address research questions on innovative phenomenon, like BYOD. This ecological perspective can demonstrate how various sources including survey, interview, observation, policies, information, communications, activities, opinions, and perceptions of the participants are woven together as ecology (Yin, 2011).

Several criteria are used to evaluate the outcomes of qualitative studies. According to Miles and Hubman (1994), the first criteria used for evaluating the

outcomes of qualitative studies are objectivity and confirmability. These criteria indicate that the results are relatively free of bias and clearly address the potential bias on the part of the researcher. The second criteria are reliability and dependability, which refers to the stability of results over time and the potential for the same methods to be used by other researchers to replicate the study (Miles & Hubman, 1994). The third criteria are internal validity and authenticity, which refers to the credibility of the study to the participants and other researchers and addresses the concerns whether the process of the study is consistent and reasonably stable over time across researchers and methods. The final criteria are the application of results to the participants, the larger population, and society methods (Miles & Hubman, 1994). These criteria will be applied and discussed further in the results and summary sections to explain and validate the final data analysis and conclusions.

A purposive convenience selection of administrators and educators at one suburban elementary school located in one northwestern school district currently implementing a BYOD policy was recruited to participate in this study. The selection consisted of two administrators, including one district administrator (superintendent) and one site administrator (principal) and three educators at the school site for a total of five participants. This elementary school is located in a large suburban northwest school district. It is well known throughout the state as a center for innovation in educational technology, high standards, and excellence. It was chosen for this study because of its proven history of success with its BYOD, AUP, the technology infrastructure, effective

device, behavior and classroom management procedures, administrator and educator knowledge and skills which supported its implementation.

Definitions

Bring your own device (BYOD) or bring your own technology (BYOT): For the purpose of this research and according to the Horizon Report (2014) these terms are synonymous and both refer to the practice of people bringing their own laptops, tablets, smartphones, or other mobile devices with them to the learning or work environment. According to the Horizon Report, Intel first originated the term BYOD in 2009 when management noted their employees began to use their own devices to connect to the company network.

Acceptable use policy (AUP): For the purpose of this research and according to Common Sense Media, (2015) an AUP is a policy that outlines, in writing, how a school or district expects its community members to behave with technology. Similar to a terms of service document, an AUP should define publicly what is deemed acceptable behavior from users of hardware and information systems such as the Internet and any applicable networks. Many schools address both acceptable and unacceptable online behavior in their AUPs – not only prohibiting certain behavior (for example, plagiarism, pirating, visiting non-school related sites, etc.), but also defining positive goals for incorporating technology into the school day. Additionally, AUPs also can help comply with E-rate requirements set forth by the Children's Internet Protection Act (CIPA).

One to one or 1:1: For the purpose of this research and according to *The Glossary of Educational Reform* (2013), the term one to one or 1:1 is applied to programs that

provide all students in a school, district, or state with their own laptop, netbook, tablet computer, or other mobile computing device. One-to-one refers to one computer for every student.

Common Core State Standards (CCSS): For the purpose of this research, the CCCS is a state-led effort that established a single set of clear educational standards for kindergarten through 12th grade in English language arts and mathematics that states voluntarily adopt. The standards are designed to ensure that students graduating from high school are prepared to enter credit bearing entry courses in 2- or 4-year college programs or enter the workforce. The standards are clear and concise to ensure that parents, teachers, and students have a clear understanding of the expectations in reading, writing, speaking and listening, language, and mathematics in school (National Governors Association Center for Best Practices, Council of Chief State School Officers, 2012).

ISTE Standards: According to the International Society for Technology in Education (ISTE), the ISTE Standards are standards for learning, teaching, and leading and are universally implemented worldwide. ISTE Standards for students, teachers, administrators, coaches, and computer science teachers all align to transform education (ISTE, 2012).

21st Century Learning: The Center for 21st Century Skills (2009) defined student outcomes as the skills, knowledge, and expertise that students should master to succeed in work and life in the 21st century including core subjects (the three R's) and 21st century themes, learning and innovation skills, creativity and innovation, critical thinking

and problem solving, communication and collaboration, information, media and technology skills, information literacy, media literacy and ICT literacy, life, and career skills.

Mobile device: For the purposes of this study, and according to Quin (2011), a mobile device is not just any digital device, but one that is "compact" and "portable" and "fits in a pocket or purse that the individual carries on a regular basis" (p. 4).

m-Learning or mobile learning: For the purposes of this study and according to Quin (2011), m-Learning or mobile learning is

> Any activity that allows individuals to be more productive when consuming, interacting with, or creating information, mediated through a compact digital portable device that the individual carries on a regular basis, has reliable connectivity, and fits in a pocket or purse. (Quin, 2011, p. 4)

These definitions were important to clarify for the purposes of this study as they either may be unfamiliar to the reader and or have multiple definitions depending upon the source.

Assumptions

It was assumed that the elementary school chosen for this study had achieved a level of success in the implementation of a BYOD policy. It was assumed that the educators and administrators who were interviewed were able to accurately and honestly convey their practices, experiences, attitudes, and beliefs in implementing the BYOD policy including the advantages, limitations, and the issues that had arisen and whether the issues had been resolved.

It was assumed that the educators and administration had a collaborative relationship and that this relationship would not skew the results unduly because of fear of reprisal. It was assumed that hesitation on the part of educators and administration to candidly respond to the interview questions was overcome through reassurance that responses and observations would be kept confidential and their individual data would not be identifiable to administrators.

Scope

The scope of this study was one suburban elementary school facility in one suburban district located in the Pacific northwest. It included purposive self-selected participants; one district, one site administrator, and three K-5 educators representing the educational community involved in the BYOD implementation at that elementary school.

Limitations

The limitations of this study were reflective of the case study methodology. The data collected on BYOD from the purposive selection of educator and administrative participants from one elementary school in one suburban district led to findings that shed light on the implementation of BYOD in other suburban elementary schools, but it is acknowledged that these findings may be useful only to other elementary schools proximal to the demographic characteristics of the subject school.

The study methodology involved the recruitment of a small, convenience, purposive participant pool, which may or may not reflect the attitudes and perceptions of a larger more diverse population of educators and administrators. The selection of participants in this study did not include parents or students. Further research designed to

include responses from a larger more diverse population of educators and administrators and parents and students would provide additional data and would be potential areas of future research.

There was an impact upon data collection due to the time constraints of the study with the relatively short period of time for interview and observation that did not allow for a longitudinal study of how the participants' attitudes, beliefs, and practices might change over time.

Another limitation was that of the technology itself and the infrastructure in place to support it. Technology rapidly advances over time making any study of educational technology potentially obsolete within a relatively short period due to innovations in the field.

In qualitative research studies, the researcher is the instrument, so it is critical that the researcher engage in self-reflection and journaling making every effort to identify any limitations and biases inherent in the study that might color or skew the results. The limitations were reflected in my biases, both recognized and unrecognized (Yin, 2011). Potential bias due to my classroom teaching, administrative experiences, and coursework in the area of educational technology was addressed and discussed. During my tenure as a classroom teacher, I received several grants and awards for technology integration both in the special education and general education areas. As a state level administrative I lead the design of Idaho's Individual Portfolio Artifact Submission System (I PASS), the first electronic portfolio assessment in the nation for students with significant cognitive disabilities, and administrated widespread implementations of statewide technology

initiatives. These experiences of witnessing the power of technology to transform teaching and learning in my own classroom and then across the state led me to pursue an advanced degree in educational technology. These experiences of integrating technology at the state level and educational technology training may have led me to view the integration of technology through BYOD policy more positively as an innovation rather than disruption than other administrators, the community, and parents. To combat this potential bias, I was careful throughout the design of this study to consider and report on the possible negative impacts, concerns, and issues with BYOD or mobile technology use in the classroom. I made a conscious effort to address all potential concerns both in the literature and throughout the study data collection process. Concerns like technical support, staff and educator overload, technology access point and other wireless infrastructure, deployment concerns, device damage and loss, equity for socioeconomically disadvantaged students, classroom and behavior management, teacher professional development, and citizenship among others.

Open-ended interview questions were purposefully crafted and were used with the intent to uncover any perceived positive or negative attitudes towards the elementary BYOD planning, implementation, and outcomes. Educators and administrators were asked multiple open-ended questions in an effort to provide opportunities to honestly convey both positive attitudes and observations, and concerns in a safe and secure manner, as all responses were kept private and confidential (Yin, 2011).

As an administrator at the state level for several years, I was privy to information regarding funding, or the lack thereof, and this also may skew my perceptions regarding

BYOD solutions for providing equity in technology access. I used open-ended interview questions and intentionally attempted to present the evidence shared with me by the participants in a way that did not convey my own state level administrative perspective and former position as the digital learning coordinator. I made every attempt not to share my own opinions or ask leading questions of the participants and to accurately transcribe and convey interview, observation, and survey results to avert the influence of my own biases so as to not color the results (Yin, 2011).

I did not share my views on BYOD either prior to, or as I conducted the interviews and observations, but practiced active listening. I recruited the participants themselves to provide feedback on the interview questions and observation protocol prior to implementation of the research to help combat the potential for influence of my own bias (Yin, 2011).

Triangulation and member checking techniques were used as the results were tabulated and analyzed to help assure that any bias on my part was acknowledged and did not influence the methodology, collection and analysis of data and the summary of results.

Significance

The significance was to inform the field of administrators and educators considering BYOD at the K-5 elementary school level. I provided an example of a BYOD AUP from the perspective of elementary educators and their administrators regarding their lived experiences as early BYOD adopters including their attitudes, beliefs, best practices, potential advantages, and disadvantages of BYOD. I detailed their

practices from developing an AUP, adequate infrastructure, communication to effective classroom management and instructional practices. I provided a unique example of BYOD implementation at the elementary level. According to Yin (2014), a case study's significance is established when the case is unique. Significance is also established when it appeals to the general public, addresses a topic of interest at a national level, or addresses a policy issue. This qualitative, descriptive case study was significant because it documented the unusual case of BYOD at the elementary school level, which could be considered of general public interest by educators across the United States. This case study was also significant, according to Yin (2014), as it addressed a "nationally important issue" because schools and districts nationwide are exploring policy options and searching for policies like BYOD to provide the technology for teaching and learning according to the CCSS at the elementary level. It is unique because it helped to fill the gap identified in current scholarly literature on BYOD policy and implementation at the U.S. elementary school level. This study provided insight into an elementary BYOD implementation through the voices of the teachers and administrators at a suburban elementary school.

This study was intended to provide useful BYOD data to researchers investigating the BYOD phenomena and state, district, and school administrators in making BYOD policy decisions at the elementary level. It identified administrator and educator attitudes, beliefs, and the advantages and limitations of elementary BYOD policy and implementation at the subject elementary school.

Study questions were designed to determine participants' attitudes and experiences as implementers of BYOD at the elementary level providing practical information for colleagues. Questions regarding whether or not administrators and educators believe BYOD potentially increase learning according to the CCSS and provide improved access to 21st century constructivist, inquiry, experiential based learning opportunities for greater numbers of students were asked to determine the potential for improving technology integration and instruction. The financial aspects of BYOD were explored to determine if BYOD was financially feasible and the cost consideration. Whether or not educators and administrators believe BYOD increases mobile device access for elementary students at a reduced cost to states, districts, and schools was a topic addressed during the interviews. This study provided a compendium of useful information for the field and may lead to increased adoption of BYOD AUP; thus, it leads to positive social change through providing data that may be used to develop a model of increased student access to devices and integration of technology into instruction in the elementary classroom. As of the date of this study, there was only one identified scholarly, peer-reviewed publication that addressed BYOD at the elementary and secondary public school level, in Australia; however, there are many popular publications that have disseminated articles and information via websites regarding BYOD, particularly at the secondary school level. Because of a lack of scholarly, peer-reviewed articles on BYOD, the literature review includes scholarly, peer-reviewed articles and data on related search terms including a sampling of major research on the implementation of mobile devices, cell and smart phones, and 1:1 initiatives at the K-12

level to demonstrate that the field has researched the effectiveness of these devices in public K-12 classrooms. These related data were used to support the contention that there is a perceived need for increased access by students to devices at the elementary level because researchers have demonstrated their effective use in the elementary classroom. This descriptive case study informs the field of education, providing data for all stakeholders regarding the implementation of BYOD including the potential benefits, concerns, and considerations for developing a corresponding revised AUP at the elementary K-5 classroom level.

This study literature review provided an overview of popular publications on the topic of BYOD, outlining the issues and possible solutions with concrete examples of the implementation of BYOD or cell phone AUP, technology infrastructure, related costs, professional development, support, behavior and device management, citizenship, and instructional techniques at the K-5 grade levels, which adds to the knowledge base providing a scholarly, peer-reviewed study and data on BYOD.

Study outcomes can be used to inform practitioners including educators and administrators exploring the potential of BYOD for their schools. Study outcomes may affect the future development of BYOD policies and drive implementation in elementary classrooms on a national basis. At a scholarly research level, study outcomes can be used to inform researchers on current elementary school BYOD policy and practice. They can also be used to inform the body of knowledge for reference purposes and to suggest further areas of investigation.

Social Change Implications

According to the Center for Digital Education and the National School Board Association, there has been a 30 % increase in BYOD in U.S. schools with 56 % of school districts surveyed implementing the BYOD policy (as cited in Horizon Report, 2014). It did not delineate the rate of adoption difference between junior-senior high schools and elementary schools. With this increase in implementation, BYOD is increasingly being considered as a viable way to increase access to technology. Administrators and educators across the United States struggle to provide funding for equitable access to technology across to students across all K-12 grade levels. BYOD may or may not enable students and teachers to use the devices they already have purchased for use at home effectively throughout the day, thus providing a classroom environment where the implementation and integration of technology is increased and funds can be focused on those students who do not have their own devices. According to the Horizon Report (2014), the implementation of BYOD is not about devices it highlights the implications for K-12 education in that it enables users to have their own devices with applications and content customized for their own use. It leads to increased personalized student centered learning and the demonstration of competencies via their own methods.

Summary

This dissertation study provided data that can be used to assist elementary and district administrators considering BYOD, those who have determined to implement a BYOD policy and need more information to lay the foundation for its implementation. It

provided data on whether a BYOD policy increases access to technology tools necessary for students to learn according to 21st century learning and standards including ISTE Standards and the CCSS. The increased access to technology tools for K-5 students, facilitated through district adoption of BYOD policy, may help districts to prepare students for the transition from elementary to junior high school, secondary school, then on to higher education and the workplace by providing the CCSS skills and learning opportunities facilitated by technology tools necessary for success.

Chapter 2 provides a description of the literature search strategy I used and a review of scholarly peer reviewed publications during the past 5 years on BYOD at the elementary, secondary and college levels. There is a lack of scholarly peer reviewed research on BYOD at the elementary school level. Chapter 2 describes the gap in the scholarly peer reviewed literature on BYOD at the elementary school level.

Chapter 2: Literature Review

Introduction

Although there is a significant body of research on the implementation of mobile devices at the higher education level, both domestically and internationally, in K-12 education, and in the business community, there is a gap in current and prior scholarly research literature on the challenges of implementing BYOD policy in the U.S. elementary classroom. Because of the limited scholarly research published within the last 5 years and BYOD status as an innovative technology practice with limited adoption, this chapter includes data and information from research and business reports; white papers; popular trade publications; non-peer-reviewed journals; magazine literature; and web site resources on 21st century learning, the CCSS, ISTE Standards, mobile device use including netbooks, 1:1, smartphone, and cell phone use in elementary school populations. The literature review includes information on the use of these devices in K-12 classrooms for experiential, project-based learning, and the legal, technical, and ethical concerns of BYOD policy.

There is a knowledge gap in the current literature on BYOD that has served as a catalyst for this study.

Literature Search Strategy

The literature search began with a Walden Library database search of *Bring Your Own Device* or *BYOD,* which did not result in any peer-reviewed, scholarly journal articles with *BYOD* as the key feature of the research problem or question/s.

I contacted the Walden Librarian who suggested a Google Scholar search using the following search terms: *Bring Your Own Technology (BYOT)* in addition to *Bring Your Own Device (BYOD)* and through a subsequent search using those terms was successful in hitting on thousands of popular publications but was not successful in locating many peer-reviewed, scholarly works. In this literature review, a scholarly, peer-reviewed publication on BYOD at the higher education level (Tyvisk, 2011) is cited. One popular publication on the list of hits using BYOD actually referred to this term: bring your laptop (BYOL).

The Google Scholar search of BYOD was done by entering a 5-year date range of publications from 2000-2015. The boxes for citations and patents were unchecked so the search did not include these publications. When this research study was first proposed on BYOD in 2013, a Google Scholar search produced 3,070 results when I used the term BYOD and 511,000 results when I used the term bring your own device. I updated the search in July of 2015 and a BYOD search yielded 12,400 results while a bring your own device yielded 751,000 results. Both of these searches resulted in thousands of hits on publications in the corporate world, higher education, and technical IT information in addition to K-12 education from sources that included news articles, magazine articles, interviews, websites, speeches, and blog posts from popular publications and social media. These popular publications were so broad in topic and scope that it was impossible to determine which of them would be applicable to BYOD, BYOT, or BYOL in the K-12 particularly in the elementary educational environment.

I then narrowed the search by using the key words *BYOD K-12* and again the list included thousands of hits. I repeated the search using *BYOD education*, and this produced 716 hits which included many relevant publications, but again this search also included hundreds of hits which were not directly relevant to the topic of this study BYOD in the elementary school as this list included popular publications for example conference interviews, news, policy papers, IT conference proceedings, blogs, and privately run personal websites and represented a wide range of unrelated topics or unreliable sources running the gamut from an unpublished paper to the transcript of a keynote speaker at a conference in Spain on mobile learning that simply mentioned BYOD. If the keyword appears once in the abstract, title, or even the text of the publication, it appears in a Google Scholar search, and this made it difficult to narrow the list further as search results included everything published on BYOD in the field of education. The vast majority of these publications on BYOD were focused on implementation at the higher education level on a wide variety of topics, which ranged from BYOD in graduate level video production to the casual mention of BYOD in an article on summer camp teachers using Scratch, which is an open source student programing site. Some popular publications were cited from this group for the literature review to illustrate how BYOD has been implemented in the business and higher education world, both in the United States and across the globe. These publications did provide some useful information to inform the study, but to cite every single popular article that mentions BYOD in the business and higher education field would not help to

address the key problem and questions of this particular study with its focus on elementary implementation of BYOD.

I then narrowed the Google Scholar search to *BYOD Education K-12* , and there were 147 results in 2013, and I updated the initial search again and got 611 results in July of 2015. It is from this list that the majority of the popular cited works were located and used to support various sections of the study. All searches revealed few scholarly, peer-reviewed journal articles on BYOD implementation at the higher education level and one on BYOD at the high school and one at the elementary level. The rest of the cited references are from popular publications. I also subscribed to Google Scholar's automatic notification to provide a daily e-mail feed of all publications on BYOD. I read each of these as they came in to ensure I did not miss any new publications.

I performed a dissertation search on ProQuest's Dissertation database using the terms BYOD and BYOT. Five dissertations were identified which addressed BYOD at the high school and elementary levels.

Additionally, there was a difference between published research on mobile device use and BYOD. Scholarly publications on mobile device use in the K-12 and higher education classroom tend to focus on the use of mobile devices provided by the school district and cell phone use while BYOD research and popular literature reports on the practice of allowing employees and students to use any electronic device they own including smartphone, iPad, iPhone, iPod, laptop, netbook, notebook, handheld, Kindle, or eReader at work and school. In this chapter, scholarly, peer-reviewed literature is

reviewed on mobile device, cell phone, and smartphone use K-post graduate use on a global scale and in the United States.

Global Educational Use of Cell Phones and Mobile Devices

Scholarly studies on the implementation of mobile learning across the globe point to evidence of increased learning of academic subjects, student performance, and positive attitudes. They reflect an open policy regarding the use of mobile devices in primary, secondary schools, and particularly in higher education classrooms in many developing nations and the developed world outside of the United States. In some instances, the United States lags behind the rest of the developed and developing world in the area of mobile technology use in the classroom. While the focus of this dissertation was on studies conducted during the last 5 years, it is important to note that studies as far back as 10 years ago for example Thornton and Houser (2003) who reported that Japanese college students actually preferred their cell phones as tools for learning nearly everything from books to communicating via e-mail. This early study, and more current research, supports the contention that the United States has lagged far behind some countries across the rest of the world in adoption of mobile and cell phone technologies for learning.

On a global scale, mobile device use is a way for higher education institutions, particularly in developing nations, to provide services to their students (Cheung & Hew, 2009; Eteokleous & Ktoridou, 2009; Fahad, 2009; Feihong, Xin, & Weini, 2011; Franklin, 2011; Suki & Suki, 2011). International secondary research findings on mobile device use are available on topics as student attitudes (James, 2011), K-12 mobile

learning (Jans & Awouters, 2009), English language instruction (Cavus & Ibrahim, 2009), reading comprehension (Chang, Lan, Chang, & Sung, 2010). In a study of mobile device use, using an open source mathematics program to reinforce mathematics topics and skills for primary school students in Malaysia, Mahamad, Ibrahim, Foad, and Taib (2008) demonstrated that a m-learning environment allowed for the improvement of tracking and monitoring of student performance, and clear evidence of student satisfaction.

Other scholars provided further evidence of mobile device classroom use facilitating a building of mathematical knowledge (Daher, 2010) across European borders (Granic, Cukusic, & Walker, 2009). Mobile technology, specifically cell phone use, is especially important in developing nations when a lack of technology infrastructure exists for example in Mongolia, the Philippines, and Malaysia (Librero, Ramos, Ranga, Triñona, & Lambert, 2007; Mahamad, Ibrahim, Ab Malek Foad, & Taib, 2008). Even remote communities often have cellular access providing students with educational opportunities in Jordan (Al-Zoubi, Alkouz, & Otair, 2008; Barclay, 2009).

Across the globe, mobile devices have been successfully used in both secondary and higher education supplanting hardwired infrastructure and devices.

U.S. Postsecondary School Cell Phone, Mobile Device Use, and BYOD

Many universities in the United States are successfully implementing student cell phone use or BYOD mobile technology and m-learning with postsecondary students (Gilroy, 2003; Jacob & Issac, 2008) and in adult education programs (Gaer, 2011). Elementary and secondary schools can learn from higher education institution

implementation of BYOD that have experienced many of the same issues. Violino (2012) discussed community college BYOD policy and claimed that community colleges have not historically dispensed 1:1 devices to students so community college students arrive on campus wanting to use their own devices. Wakefield Research (2012) found 98 % of all college students surveyed who own a device have used it for schoolwork, 53 % read e-books, 67 % of college students reporting they cannot go more than 1 hour without using technology, and many use three devices as support for the implementation of BYOD (as cited in Violino, 2012). Violino explained that the two most pressing issues for community college implementation are support and security. Violino recommended that institutions should develop a policy, put security mechanisms in place, register all devices, have users sign a security agreement, and ensure student users do not have access to secure data.

U.S. High School Cell Phone and Mobile Device Use

Cell phones afford students increased access to Internet research resources, social networking, backchannels, calculation, measurement, data collection, quiz, and polling across the curriculum (Engel & Green, 2011; Humble-Thaden, 2011) and in public school libraries (Kendall, Nino, & Stewart, 2010). While cell phone use in the classroom is only one of the tools in the suite permitted by a BYOD AUP, there is a considerable number of publications documenting successful cell phone use in U.S. classrooms over the past few years, and these successes with cell phone implementation can be used to support expansion to BYOD as many of the practices and recommendations are applicable to BYOD as well. Kolb's (2009) moniker for personal cell phone use in the BYOD

classroom was the “Swiss army knife” of educational tools. Kolb identified several reasons why both educators and administrators have not been quick to adopt cell phones as learning tools. According to Kolb, administrators and educators lack a vision of cell phone educational use, have concerns about sexting, cheating, texting while driving, distraction in the classroom, fear the unknown, fear students know more about cell phones than they do, and fear community objections.

There is widespread debate over cell phone use (Johnson & Kritsonis, 2007) and security issues. There is increasing evidence that the public sector and educator concerns and issues surrounding security and protecting students can successfully be addressed (Robinson, Brown, & Green, 2010). Research on security and safety issues does not address those peculiar to BYOD nor has BYOD been a topic of these publications in the past but it can be extrapolated that many of the same security and safety issues will be of concern with BYOD as well. These publications will assist districts and schools in addressing BYOD security issues. Current information, not yet available in published scholarly research articles or books, describing specialized systems and applications that facilitate BYOD and security issues can also be found in online and popular publications.

Security concerns continue to be of paramount importance and are expressed by all stakeholders. These concerns should be addressed. Robinson, Brown, and Green (2010) made a case for students and teachers to have increased access to technology and the Internet. Robinson et al. (2010) stated that educators can’t protect students through restrictive technology use policies especially regarding use of technology for communication, and if the result is that we decrease the use of technology the goals of

integration of technology and improved learning are compromised. Robinson et al. (2010) defined an AUP policy as a set of regulations governing when and how students can use computers and the Internet. It also defines the content considered appropriate students have access to online as well as permissible use of technology for school purposes only. The AUP governs computer use including not only the written rules but the consequences for not following them (Robinson et al, 2010).

Districts have enacted strict AUPs and require parental signatures to alleviate the pressure on parents to keep their children safe, to ensure receipt of federal funding, and to limit district liability from lawsuits. Districts have also used antivirus programs and protocols for accessing information to ensure appropriate device use. Many AUP are focused on punishment rather than providing the support necessary for integrating technology in the classroom. Robinson et al. stated, "eight security threats that directly affect students and educators; inappropriate content, predators, or ensnarement, misuse of mobile communication devices, cyberbullying, network security, inappropriate network use, copyright infringement, data and identity threats" (Robinson et. al., p. 10). Much of this information applies to the consideration and implementation of BYOD, but most likely, BYOD will require districts to revisit these prior AUPs. There may or may not be issues unique to BYOD use in the classroom, as compared to district-purchased device use, and there were technological advances during the last 3 years that make BYOD feasible.

There are no research-based frameworks for BYOD, nor specific pedagogy, but there is one widely used framework for mobile technologies in general. Puentadura

(2012) developed a comprehensive 4-level framework called the SAMR model that provides a model for conceptualizing and explaining to educators and administrators how mobile technologies can transform classroom learning experiences and student outcomes and morph from a subject into a tool to facilitate the CCSS and ISTE Standards. This SAMR model can be used by districts to support the pedagogical shift necessary to support mobile technologies in general, but also can be used to support BYOD initiatives. The first level of SAMR is S for substitution, where technology acts as a direct tool substitute, with no functional change (Puentadura, 2012). The second level is A for augmentation, where technology acts as a direct tool substitute with functional improvement (Puentadura, 2012). The third level of the hierarchy is M for modification, whereby technology allows for significant task redesign, and the final most sophisticated educational use of technology is defined as R for redefinition, where technology use in education allows for the creation of new tasks previously inconceivable to educators and administrators (Puentadura, 2012). It is this last level of SAMR, redefinition, where education is poised at an uncharted new horizon of educational uses of a variety of mobile devices in the classroom (Puentadura, 2012).

Variety in mobile device use among students and teachers has increased with the emergence of BYOD. We can apply this SAMR framework, developed for mobile devices in general, to BYOD but does a new BYOD paradigm require a new pedagogy and will it come from researchers in the field or from the practitioners in the field itself? These are topics worthy of further investigation but beyond the scope of this study. In light of the lack of scholarly, peer-reviewed research, practitioners have forged ahead in

developing BYOD policy and practices. It will be the job of researchers to document current practice in the field and that is what this study attempted to accomplish in this literature review.

Scholarly Peer Reviewed Publications on BYOD

An exhaustive literature review revealed few published scholarly peer reviewed journal articles on BYOD at the elementary school level. Articles were published at the higher education implementation level, at the senior high and junior high school levels but only one dissertation and one article was published in scholarly peer reviewed journals on BYOD implementation at the elementary classroom level.

At the higher education level of implementation is a small case study on BYOD that originated at the Queensland University of Technology in Australia conducted by Dr. Shaun Nykvist, entitled, *The Trials and Tribulations of a BYOD Science Classroom* published as conference proceedings by the 2nd International STEM in Education Conference Beijing China in 2012. Nykvist (2012) pointed out the challenges faced by instructors and students in implementation of a BYOD policy at the higher education level. He shared that the distinctions between mobile device and mobile phone have become blurred as smartphone devices also provide access to downloadable software or apps. Students in this study used their own devices in an open space for communication for both teaching and learning about science. All but one of the 16 students owned their own device at the beginning of the study. An iPad was made available to provide equitable access for that student until the third week when the remaining student bought a device. Two types of devices were owned by participants, smartphones (either an Apple

iPhone or Android) or an iPad tablet computer. While all students reported using a computer prior to the study none of the students had used a smartphone or tablet in teaching and learning. Data collected through surveys, group interviews, and class records reveal several considerations for implementing BYOD at the higher education level and included the following coined trials and tribulations; access to common software, data storage, retrieval and presentations, network infrastructure, and multiple platform familiarity. Most important according to Nikvist on this list was Network Infrastructure. Slowness or difficulty obtaining an IP address when multiple users were on an inadequate network was observed. Nikvist (2012) reported that networks may not be robust enough to hand the increased traffic on the wireless and some apps they tried were not developed to be used on subnets in a corporate wireless configuration. Another issue was reliance on 3G or 4G networks for field work when signals may or may not be available at various locations. The extent of individual student data plans also may restrict use and be an equity issue, as not all students may have an adequate plan to accommodate extensive classroom use due to affordability. He advised instructors to text the 3G and 4G network in the field if planning to have students use it outside of the classroom for instructional purposes. An issue also occurred when students shared presentations or results as not all devices connected to the projector and the wireless capability of the projector may have been arbitrarily turned off according to outdated policy, so Nykvist (2012) reiterated testing the student owned device and projector compatibility as important for presentations to run smoothly in class. Nykvist (2012) further stated that apps may have been developed for one or the other of the devices but

not both, so instructors need to be aware of what apps will work on what device, Instructors need make sure the apps used for instruction are accessible by all or make the app a course requirement like a textbook and students must use the corresponding device upon which it will work. Nykvist (2012) pointed out the importance for instructors to be familiar with the apps across multiple platforms so they can be a resource to students. Nykvist (2012) advocated class time for pre-training on the standardized use of cloud storage for instance Google or Dropbox to facilitate group collaboration, data collection and to avoid the device specific apps that inhibit communication by students working in groups using different apps.

Nykvist (2012) concluded that there is very little evidence of new pedagogy developed in response to the rapid adoption of emerging technologies and their BYOD implementation and that these challenges need to be addressed in the areas of infrastructure, policy, and procedures. He predicted IT staff will need to refocus efforts from maintaining large computer labs to supporting the individual needs of students and staff.

BYOD Journal Articles and Dissertations K-12

The literature searches for K-12 BYOD scholarly peer reviewed research revealed the following resources: four dissertations published on ProQuest that present findings on BYOD and BYOT at the junior or senior high school levels and one dissertation at the elementary level. One peer reviewed scholarly journal article at the elementary level was found. This is evidence of a gap in the literature on BYOD at the elementary school level.

Factors Impacting BYOD Levels of Use at the High School Level

Ross (2013) examined the levels of use of BYOD by teachers at a high performing, high SES suburban high school. He examined the instructional decisions, collaboration on BYOD, professional development participation, levels of use between early career and veteran teachers, and barriers to successful implementation. Findings indicate teachers made instructional decisions worked collaboratively based upon the Level of Use while few participated in professional development. Experience with student-centered learning was shown to be an indicator of BYOD integration.

BYOD and Engagement at the HS Level

In an ethnographic study, Boyd (2015) presents qualitative and quantitative data on the effect of BYOT on high school student engagement and found no significant difference in level of engagement when BYOT was used for instructional purposes. He did find student engagement increased with teacher support, their proficiency with technology and the implementation of student-directed learning using Web 2.0.

Teacher Perceptions of BYOD at the HS Level

In this qualitative case study Jones (2014) shed light on the perceptions of 12 high school teachers at single site. Findings show confidence in technology ability, personal technology use, and experience may not have an impact on willingness to implement BYOT and technology-centered teacher training may have minimal impact on classroom integration of BYOT. Recommendations include professional development customized for adult learners and related to specific content areas. Jones (2014) draws attention to

teachers' perception of problems with equity and behavior management that adversely affect BYOT implementation.

BYOT and Learning at the Junior-Senior HS Level

O'Sullivan (2013) student, teacher and administrator interview and observation data indicated students' devices are pedagogically integrated into the curriculum in project-based learning. Teachers perceived a higher level of student engagement and students perceived increased relevance. BYOD addresses different learning styles and was preferred by students.

BYOD and Professional Development at the Elementary School Level

Otstot (2015) presented findings on the effectiveness of a collaborative apprenticeship professional development model for elementary teachers on the integration of BYOD. Otstot (2015) supported the notion that peer mentorship provided beneficial support and provides practical information to guide professional development for BYOD implementation.

BYOD and Science Inquiry in the Elementary Classroom

Song (2014) studied the effect of BYOD policy in one primary science classroom while studying the "Anatomy of a Fish" and presented its effect upon student content knowledge and student perceptions regarding their learning experiences. Song (2014) indicated that students' understandings are more advanced when using BYOD than that available from a text based instruction, and they exhibit a more positive attitude towards learning.

This single study on BYOD practices in the subject area of science at the elementary level also supports the assertion of a gap in the literature on the attitudes and perceptions of elementary level educators on BYOD.

Educational Technology Reports and White Papers BYOD

K-12 Horizon Reports from the New Media Consortium for School Networking 2012, 2013, 2014 and 2015 and Project Tomorrow Reports 2013, 2014 and 2015. Since 2003, an education nonprofit organization called Project Tomorrow conducts an annual project. They publish data in annual reports on innovative practices, educators' and administrators' attitudes, practices and parent attitudes on what is trending in digital learning across the US in districts and schools.

According to the Project Tomorrow Report, *Online Learning Virtual, Flipped and Blended Classrooms* published in 2013, 89 % of parents wanted their children in a class where mobile devices are used and 58 % of administrators polled wanted digital tools and resources that provide solutions to integrate 21st century skill development into the curriculum. The critical question is how are districts going to meet this growing demand and what is the evidence that BYOD fulfills that need? This literature review attempts to provide insight into the issues and possible solutions presented outside of scholarly peer reviewed research in an effort to inform the study and the field.

The most recent report entitled, *Trends in Digital Learning Empowering Innovative Classroom Models for Learning* (Horizon, 2015) is based upon data collected in 2014 from more than 521,000 K-12 participants across the US and reflects national trends. It reports that "more than 78 % of K-12 parents believe the best way for their

child to develop skills that will lead them towards future success is to use technology on a regular basis". It also states, the use of digital content in the classroom rose from 42 % in 2013 to 61 % in 2014 an increase of 45 %, the use of digital textbooks rather than print textbooks rose from 28 % 51 % an increase of 82 % during that same period. Mobile learning through the use of tablets or other devices rose from 40 % to 58 % a 41 % increase from 2013 to 2014. Students in blended learning classrooms reported the following: "As a result of using technology to support my learning…61 % collaborate more with my classmates, 54 % I am developing critical thinking and problem solving skills, 61 % I am able to learn at my own pace, 63 % I am developing my creativity skills 48 % I am more interested in what I am learning in class". These finding all reflect a dramatic increase in the use of digital learning in US classrooms and a preference of students for blended learning environments.

The Horizon Reports; 2012, 2013, 2014 and 2015 editions, cited in this literature review are the fourth through seventh in the series of a collaborative effort between the New Media Consortium for School Networking and the International Society for Technology in Education. These annual reports examined emerging technologies for their potential impact on K-12 education and were created by an advisory board consisting of an international body of experts in the field of educational technology. There are three global editions including higher education, primary and secondary education (K-12) and museum education. The 2012-2013 Horizon report predicted an increased revision of AUP policies and BYOD implementation at the K-12 school level. They provide useful information that can be used to inform the field on current practices for consideration by

districts in implementing BYOD and these reports highlight the need for increased access to mobile devices by K-12 education to implement the ISTE Standards and CCSS.

The 2012 through 2015 Horizon reports are discussed as they both give insight into the changing landscape of BYOD implementations that has occurred over just the last 4 years and provide insight into current and future emerging technologies. The Horizon Report provides access to an open content database, the NMC Horizon Project Navigator found at www.navigator.nmc.org and a NMC Horizon EdTech Weekly App for the iPhone and iPad at go.nmc.org/app and all data can be downloaded from iTunes.

The 2012 and 2013 Horizon Reports reported on six technologies for placement in three adoption horizons indicating timeframes for mainstream use for teaching and learning. These three adoption cycles include the near-term horizon, for predictions over the next 12 months, mid-term within the next 2-3 years and the far-term horizon of 4-5 years.

For the purpose of this study these adoption horizons can help determine if BYOD and AUP revision are considered emerging trends and how they fit into the overall picture of K-12 technology integration. Discussion of these adoption cycles may also help districts to use study outcomes and the Horizon Report predictions to consider BYOD then map out their own BYOD 5 year plans including any AUP revisions that will make them possible.

The first cycle of the Horizon Report of 2012 near-term predictions covering twelve months has already passed, so these predictions, if accurate for the near term should already be seen in practice across the US. The 2012 Horizon report emphasized

that mobile devices and apps would be increasingly valued as important learning tools in K-12 and although they are often banned by school districts would become an integral part of everyday life and increasingly be used by students to work, play and learn whenever and wherever they are 24/7. The Horizon report stated that schools increasingly would see mobile device value as a means to access a variety of applications from graphing, to eBook use and storing and sharing notes and would begin to rethink restrictive use policies to enable them to embrace the BYOD movement. The Horizon Report clearly provided support for district consideration and implementation of Acceptable Use Policies that supported BYOD and predicted that BYOD would become the norm. While there were scattered reports of BYOD across the US at the high school and junior high levels in popular literature it is not clear how widespread the adoption of BYOD and AUP actually is years later. We are well into 2016 and there remain many districts across the US who have not even begun to consider BYOD AUP, particularly at the elementary level. The Horizon predictions for the near term in 2012 may have been premature and failed to consider the obstacle already in place at the district level with restrictive use policies that prohibit BYOD.

Reports from the Field BYOD, BYOT and BYOL in Popular Publications

This literature review found only one peer reviewed scholarly article on Bring Your Own Device (BYOD) published by (Nykvst) in an Australian journal at the university level but many articles were published in popular publications and Internet sites on the topic of BYOD, Bring Your Own Technology (BYOT) and Bring Your Own Learning (BYOL) by tech experts, professors, district administrators and educators that

outline various misconceptions, issues, possible solutions and recommendations to facilitate a successful implementation. This literature review documented the limited scholarly research, but also importantly presented reports of successful K-12 BYOD, BYOT and BYOL implementation published in popular publications from practitioners in the field. The scholarly community has not researched the intricacies of BYOD policy and implementation but much valuable information can be gleaned from the virtual world of blogs, online editorials, popular magazines and non-scholarly journals to inform this study, the scholarly community and district administrators considering implementation.

Administrators are beginning to consider BYOD. According to Doug Johnson, Director of media and technology at Mankato Area Public Schools, there are several reasons why students are being encouraged to bring their own devices. Factors include a price drop to an affordable level for families; parent awareness of their power and use the devices themselves; educators becoming more familiar with apps and instructional methodology; while districts realize they may never have adequate funding to meet the burgeoning need (Johnson, 2012).

BYOD, BYOT, BYOL - Issues and Recommendations from the Field

While there is a dearth of published peer reviewed scholarly research on the BYOD, BYOT, BYOL topics and this study attempted to bridge that gap, it is necessary for a thorough understanding of the dissertation study data and results to review the most current information available found in other popular sources most reflective of current BYOD practices in K-12 education across the US. Throughout this section, current non-peer reviewed popular publications from experts and administrators in the field share

insight on issues and recommendations on BYOD, BYOT, BYOL and student cell phone use in the K-12 classroom. This section included an extensive literature review of popular publications with a synthesis and summary of information found in many sources including journals, magazines, books, literature, white papers, reports and various virtual sources like blogs and websites. There are many issues districts and schools have dealt with, when implementing a BYOD AUP that form a common thread and become apparent when examining current field practices. While not scholarly peer reviewed research, these publications from the field help to shed light on experts, districts, schools and individual educators who are pioneering this movement and share their experiences to inform the field providing insight into issues and recommendations.

BYOD increases the digital divide- issue and recommendations. One of the primary issues reported across all stakeholder groups in popular publications is a concern that BYOD, BYOT or BYOL will deepen the digital divide. According to Tim Clark, district instructional technology specialist with Forsyth County Schools in Georgia, "Students who do not have personal technology devices have greater access to school owned technology tool when students who bring their own devices to school are no longer competing for that access." BYOD allows districts to concentrate resources on those students in the most need (Nielsen, 2011).

Gray (2012) reported on the equity issues encountered and solutions during the BYOD implementation in Lake Travis (TX) Independent School District. Wealthier families purchase devices for their children, low-income students use devices purchased

by the district through a bond and middle class families can use the districts buying and leasing power by using the districts vendor agreements.

Schaffhauser (2011) a Forest Hills Junior High School BYOL pilot administrator handled the equity issue by allowing students who did not own devices to check out laptops during classroom time assuring all students had access to a device during the school day.

BYOD increases cyberbullying and sexting - issue and recommendations

Another concern of nearly all stakeholders, as conveyed by Nielsen (2011), is that BYOD may increasingly lead students to participate in dangerous activities including sexting with peers, cyberbullying and online contact with unscrupulous adults. This concern is expressed by administrators, educators and parents alike across most literature.

Robinson, Brown and Green, (2010) presented and discussed various solutions many districts have enacted to exert control over user access to content including limiting access three ways. First digitally through the installation of software at the individual device or proxy server district level to filter or block sties, developing AUP and or directly supervising users. According to Robinson, Brown and Green, (2010) two different types of software can be used, filtering and blocking. Blocking creates a list of blocked sites while filtering software uses keywords or banks of keywords to block inappropriate sites. Robinson, Brown and Green (2010) cite a 2006 public policy report by Heins and Feldman who found that the best blocking software blocked 96 % of pornographic sites at the district level, but lower levels in the art and photography, sex education, terrorism and racism categories. Even with the best filtering software complete

Internet safety is not certain so policy and direct supervision are also necessary (Robinson, Brown & Green, pp. 18-19, 2010).

Authors of current reports claim that when schools have restrictive AUP and students are using mobile devices only at home, they are much more likely to be using devices unsupervised without engaging in any training on digital citizenship or on strategies for increasing Internet safety. Students are much less likely to have an adult monitoring their online and messaging activities at home. Bringing the device to school may increase the activities that provide a safety measure for mobile device use that will transfer to the home environment. Many authors of articles in popular journals point to addressing BYOD by adapting existing AUP focusing on behavior and consequences rather than tools. The most successful programs facilitate dialogue and relationships between students and teachers on appropriate uses of technologies and the dangers they may encounter when online rather than sweep the topic under the rug. Rather than focus on the tools the community and district should focus on how to use them, whether they are technology provided by the district or BYOD (Nielsen, 2011).

Kolb (2009) advocated the student use of cell phones (a form of BYOD) in the classroom and used the term "mobile literacy" to refer to the provision by school districts of education on the appropriate use of cell phones as learning tools. She stated mobile literacy as an instructional topic is a prerequisite to educational cell phone use. Mobile literacy instruction is necessary to inform all stakeholders including students and their parents, and staff about the devastating effects of sexting or sending inappropriate text messages or videos.

Gray (2012) reported that revision of AUP and student handbooks was not necessary in the Lake Travis (TX) Independent School District as current editions had already addressed student behavior in relation to sexting, cyberbullying and the same rules applied whether the device was district or student owned. Stephens and Fanning (2013), two tech savvy librarians who implemented a BYOD pilot at the HS level, reported educators in their district were also concerned about the possible misuse of BYOD technology but likened technology to a tool stating, "As long as there have been schools, students have chosen to misuse the available tools. Teens will push the boundaries with language, images and innuendo through whatever medium. But educators haven't banned crayons, pencils and pens just because a student might inscribe a textbook with profanity or a lewd image" (Stephens and Fanning, 2013 p.13). The authors are in agreement with other BYOD early adopters who stated that recognizing the difference between the behavior and the tool was a fundamental element of their implementation of BYOD. A common thread is that the focus should be on revising BYOD AUP policy, developing curriculum and instructional resources to teach appropriate use and developing communication and trust and techniques to monitor the behavior rather than restrict the tool.

AUP - issues and recommendations. Robinson, Brown and Green, (2010) provided a historical perspective on AUPs and referred to the Children's Internet Protection Act (CIPA) of 2000 that was originally designed as a regulation to help ensure the safety and security of the nation's children but may be the source of overly restrictive school district AUPs that virtually shut down access to the Internet for many students and

their teachers. This act required schools to officially adopt policies to protect students from inappropriate content on the Internet and linked this protection to the receipt of federal E-rate funding for technology.

In developing an AUP, Ackerman and Krupp (2012) advised districts to address foreseeable problems in policy and through the use of a BYOT Use Contract signed by parents and students that delineates policy for liability for lost or stolen devices, students who cannot afford a device, accessing inappropriate content and repairs and clearly delineate consequences. Ullman (2011) advocated revising the AUP and also including the information in the student handbook to inform students, parents and staff. Without exception the consensus is that districts must review and in most cases revise AUP to assist educators in establishing expectations for use (Johnson, 2012).

BYOD requires communication and partnership - issues and recommendations. According to a survey entitled, *Learning in the 21st Century: 3Taking it Mobile!* a Project Tomorrow report published in 2011, 62 % of parents reported that if their child's school allowed devices to be used for educational purposes, they would most likely purchase a mobile device for their child. This points to the importance and need for districts to communicate and develop a partnership with families in the pursuit of BYOD implementation.

Ackerman and Krupp, (2012) further affirm that stakeholders need to be vested by creating a partnership including the superintendent, IT department, principals, supervisors, curriculum developers, parents and the community with shared a vision and goals.

Districts can assist parents by communicating device specifications in an effort to assist them in choosing the device most suited for use in the classroom and some have developed online resources for this purpose (Johnson, 2012).

BYOD Requires Community, Staff and Student Communications - issues and recommendations. Some districts reported conducting a parent survey prior to implementation as reported by Schaffhauser (2011) who subsequently hosted three advisory group meetings where families were first introduced to various laptop devices, then attended a mini-course on the integration of the devices into the curriculum and finally attended a third meeting focused on the various programs that would be used during the pilot. Participating students were required to attend a special half day camp called Conversations about My Personal Learning or CAMP-L where participating students learned about; care of the laptops, digital citizenship, Internet safety and instructional uses and rules including labeling the computer with the student name, installing free geotracking software called Prey to combat loss and theft and to keep the device in locked classrooms or secure lockers.

BYOD places undue burden on educators to increase expertise across multiple devices - issues and recommendations. Nielsen, (2011) wrote that educators also express concern that if BYOD is implemented they will need to become experts in all technologies used by their students, but current practitioners of BYOD share that students act as technology resource teachers, coaching their peers and teachers and that students are the experts on their own technology.

BYOD presents increased need for planning and professional development - issues and recommendations. Several recent popular publications from the field have outlined detailed plans or made recommendations according to their experiences implementing BYOD, BYOT, BYOL or a permissive AUP that includes the student use of cell phones.

Williard's Pyramid outlines a progressive plan to implement BYOD from most to least important including funding, leadership, tech planning, support, standards, infrastructure, hardware and software, actualization, and advocates a professional development program that prepares educators and supports them through implementation (Ullman, 2011).

Lisa Nielsen the author of *"Teaching Generation Text: Using Cell Phones to Enhance Learning"* described a framework for schools with information on the importance of professional development; seven building blocks for success and a plan to break the ban along with lessons that are research based.

During the BYOL (Bring Your Own Laptop) implementation at the Forest Hills Junior High pilot, reported by Schaffhauser (2011) the district focused upon helping teachers feel comfortable with technology and Web 2.0 through survey, discussion and extensive professional development that lead to a successful implementation that increased access to technology for students through BYOL.

Several recommendations for a successful implementation of mobile technology implementation at the district level in general were published by the field of practitioners. Lucy Gray the Director of the Leadership for Mobile Learning (LML) Initiative at the

Consortium for School Networking (CoSN) has authored many publications reporting on successful BYOD implementations across the country. Gray (2012) has stated that there is a need for districts to promote a safe culture where teachers can feel comfortable experimenting with mobile device use during classroom instruction. Gray recommended that districts develop a strategic multiyear plan, as did many other publications. Johnson (2012) also stressed the need to maximize success and mitigate problems through thorough a comprehensive plan. He advocated staff training on specific methodologies to help educators and administrators understand specifically how the devices and apps can be used in the classroom; polling, research, writing and peer editing, consulting experts, and creating multimedia presentations (Johnson, 2012).

Johnson (2012) also stressed the importance of outlining the rationale or "why" of the plan so that all stakeholders have a thorough understanding. He reported that important components of the rationale and plan could include such things as increasing student motivation and engagement, supporting differentiation of instruction, accessing district online resources and helping educators with classroom management.

In the article *Bring Your Own Excitement* authors Stephens and Fanning (2013) reported on their districts pilot implementation of BYOD for Digital Learning Day where educators planned a district event begun 2 years prior to promote digital learning across the United States. They hosted a mandatory professional development program that provided them with opportunities for hands on experiences with polling, Internet research and testimonials by educators already using BYOD. He reported that these hands on introductory sessions alleviated educator anxiety.

BYOD threatens district data security - issues and recommendations. In the book, *Security vs. Access Balancing Safety and Productivity in the Digital School* districts considering BYOD security issues are encouraged to consider solutions including; "limiting access digitally, deterring intentional access through policy and preventing exposure through district supervision" (Robinson, Brown & Green, 2015, p. 18). Blocking access can be accomplished through installation of filtering software to block a specific list of keyword searches and or specific sites at the proxy server level. They also emphasize the importance of teaching responsible use through critical thinking and decision making in addition to having teachers monitor student use checking Internet history. This book also reports on and makes recommendations for addressing parental concerns regarding Internet use including sexual predators and cyberbullying (Robinson, Brown & Green, 2015).

In *Five Components to Consider for BYOT/BYOD,* Ackerman and Krupp (2012) asserted that BYOD provides a platform whereby students assume the role of active participant in their own learning 24-7 by enabling students and teachers to access the school network with their own devices. They proceeded to outline five components to consider, not only for a practical implementation for all stakeholders but also to drive the pedagogy that transforms how students learn. Ackerman and Krupp's (2012) work was based upon an expansion of Williard's Pyramid as reported in Ullman (2011). They proposed that the number one issue is security. At issue is how districts can ensure the security of all stakeholders including its educators, administrators, their own district databases full of secure information, and student data when students and educators access

the network through BYOD. They claim there is an issue across all district infrastructure; including wireless networks and access points. Ackerman and Krupp, (2012) state a viable option to improve security and control access is for the district to set up a separate network for students. Separate networks keep students off of the network used by educators and administrators for storage and accessing secure personal and assessment data.

As reported by Ullman (2011) an example of assuring security is the Alvarado Independent School District network that requires the user to identify themselves, agree to usage requirements and sign on a screen similar to that seen when accessing a hotel network using a secure user name and password.

BYOD necessitates district and school technology infrastructure upgrade - increased access points - issues and recommendations. The ABC's of BYOL (Bring Your Own Laptop) by Dian Schaffhauser (2011) outlines the Ohio Forest Hills School District's experience with BYOL pilot at one junior high that limited students to bringing laptops, netbooks or tablets, but many of the issues and ideas can inform a BYOD implementation. Schaffhauser (2011) identified issues she encountered including the upgrade of the infrastructure beginning with the need to install more access points for the anticipated increased usage of the Internet at the pilot BYOD school. In the Lake Travis (TX) Independent School District more access points were added to the wireless network, along with anchor mobility, that is offered through Cisco. "The network recognizes if you are not on a district wireless device and routes you into tunneled Internet access at no extra cost," says district administrator Casey. "We have no security concerns since

everything goes through our filtering." Once they are online, students log in to the district's online learning portal, a one-stop shop for online textbooks and digital resources. Gray, (2012) and Johnson (2012) stressed the importance of considering any additional costs associated with improving the infrastructure including testing district bandwidth to ensure that as multimedia technologies were used by multiple devices it is adequate for the traffic.

BYOD is a distraction in the classroom - issues and recommendations. A third issue cited by Nielsen (2011) was that many parents and educators have questioned whether BYOD will lead to distraction in the classroom with students tempted to text message, e-mail or surf the Internet during lessons. Experienced teachers reported that if the correct strategies are implemented, including updated Acceptable Use Policies (AUP) with clear consequences, that students become more self-directed, hold each other accountable and that BYOD actually leads to learning that extends to those hours outside of the ordinary school schedule (Nielsen, 2011).

BYOD limits lesson design according to the weakest device - issues and recommendations. According to Nielsen (2011) an issue reported by some educational leaders is that BYOD will only allow the design of lessons that take advantage of the features of the weakest device in the classroom. This observation is proposed by Gary Stager in his blog post "BYOD the Worst Idea of the Century?" where he claims that BYOD dumbs down instructional potential when teachers have to adjust lessons due to the limitations of those devices with weaker functionality. According to Nielson (2011) this is not the case, as reported by teachers experienced in BYOD, who report that

teachers and students work together to identify the possible uses; and make full use of the devices because many devices have capabilities that cross platforms like Internet access for research purposes, photo, video and podcast capabilities of the smartphone, iPhone, laptop, iPad, and iPod devices.

BYOD requires district standardization of apps and programs across multiple devices - issues and recommendations. Educators and administrators may also be concerned that they will have to standardize programs and apps across all devices that are used by students if BYOD is implemented, but according to examples shared by Nielsen (2011) that is not the case in the school districts who have successfully implemented BYOD. An example is Michelle Luhtla, librarian at New Canaan High School in Connecticut who stated, "Teachers at her school are often surprised by which devices kids choose to use and how they use them." In this district, students and teachers are discovering multiple ways to meet learning goals on various devices with a multitude of programs and the district did not standardize apps and programs across devices. Some districts encourage digital resources that can be used on a wide range of devices (Johnson, 2012).

iPhone and smartphone technology have limited educational use - issues and recommendations. Nielsen (2011) stated that implementing a BYOD AUP allows students to not only bring netbooks and laptops but also permits them to bring smartphones and iPhones to school and provided evidence of successful use for instructional purposes. Smartphone and iPhone accessibility leads to another specific issue proposed by stakeholders across the board, the idea that classroom use of cell

phones is a waste of time as they are not powerful enough nor have a large enough screen for effective use in the classroom setting for instruction and learning, thus cell phone use should not be permitted. There are many published peer review journal studies and popular articles that have clearly demonstrated that cell phone and mobile device use in the classroom can facilitate student centered, project based 21st century learning. These publications over the past few years have outlined instructional value and that students can successfully use Smartphones and iPhones in spite of their small screen size in a multitude of capacities including; social networking, video recording and editing, writing, research, data collection, geotracking, polling, as student response systems and a myriad of other uses (Stephens & Fanning, 2013).

Whole district verses school site pilot roll out - issues and recommendations. Ackerman and Krupp, (2012) advocated for a small scale BYOD pilot program in the upper grades prior to district-wide implementation to iron out difficulties and ensure success. In guides published by the Consortium for School Networking (CoSN) it was recommended districts roll out for a small pilot first; for a successful implementation of mobile technology implementation,

- As the price point for mobile devices drops ever lower, in the very near future it may become a reality that nearly every student in the U.S. will be able to afford a device. A BYOD AUP and initiative may become the norm across the U.S. In the interim, while the price of an individual mobile device is still relatively high for school district or state funding, BYOD has the potential to be part of the solution providing increased access for all students in a cost

efficient way. The implementation of a BYOD AUP may help to answer the imperative to fully integrate technology as a tool into the new school paradigm of 24/7 anywhere anytime learning according the CCSS and ISTE Standards.

Chapter 3: Research Method

Introduction

The purpose of this descriptive case study was to provide insight into the phenomena of a suburban elementary deployment and implementation of a BYOD policy. I attempted to provide insights on the limitations and advantages of BYOD including a stakeholder ecological analysis; that recorded and analyzed data through district and site document literature review, a survey of the teaching staff at the site, individual interviews, and observations. I documented the administrator and educator practices, perceptions, and attitudes towards the phenomena of BYOD at this site. The site selected for this study was a suburban elementary K-5 school in the Pacific Northwest; that has adopted a school-wide BYOD policy and implementation.

Research Design and Rationale

Research Questions

The main question of this research, directly aligned to the problem statement was the following: How does the phenomenon of a BYOD policy instituted at one northwest suburban U.S. elementary school site meet the need to provide increased access, use, and integration of mobile technology aligned to the CCSS and ISTE Standards? This question led to the development of these subquestions.

- What are the district and site administrator's perceptions of and attitudes towards BYOD?
- What are the educators' perceptions of and attitudes towards BYOD?

- What BYOD classroom management and instructional techniques are used?
- How are the students using BYOD?

Central Concepts and Phenomena

The central concepts and phenomena that were the focus of this descriptive case study were the perceived self-reported attitudes, perceptions, and observed practices of elementary K-5 teachers and administrators implementing BYOD policy at one suburban northwest school. These phenomena were studied via interview and observation; in order to determine the factors that facilitated their BYOD adoption and continued practice. I explored the factors that determine whether it was a feasible option to increase technology access and learning according to ISTE Standards and the CCSS at this particular site.

Research Tradition

The research tradition chosen for this study was a qualitative descriptive case study. According to Yin (2011), during the course of a qualitative, descriptive case study, the case is the unit of analysis and is determined by the research question. In a descriptive case study, data collection and interpretation captures the uniqueness of the events. The descriptive case study methodology was chosen because it permitted the analysis of this BYOD case and captured the unique phenomenon and course of events due to the implementation of BYOD at the northwest suburban K-5 elementary school. It provided participants with a voice to relate their perceived attitudes, beliefs, and experiences as a way to document their practices.

Rationale

The descriptive case study methodology gave the stakeholders a voice through the interview process where participants had the opportunity to share their perceptions and attitudes. It provided an iterative process that allowed for an unfolding of branching data derived from multiple sources. Unlike quantitative research with its focus on hypothesis testing, which leads to a linear design and result, a descriptive case study allowed for a study design aligned to answer research questions on innovative phenomenon like BYOD from the perspective of the participants themselves. A quantitative methodology was not used because it focuses on hypothesis testing. Other qualitative designs, specifically the phenomenological design, were considered but rejected; because the research questions can best be answered through descriptive case study and its focus on the lived experiences of the participants by giving them a voice. In this study, I demonstrated how various district and school policy and information were communicated to educators on BYOD in combination with the activities, perceptions, and attitudes of the participants.

Role of the Researcher

My role as the researcher, in the context of this qualitative descriptive case study, included interviewer, observer, and collector of web and paper resources. As the interviewer and observer, I actively engaged in interactions with the participants through interviews and observed them in their natural settings to provide a record of the case. In this holistic approach, one of the goals was to record the perceived experiences and realities of the case, as told by the participants during the interview process, thus giving them a voice. Unlike quantitative research, with its focus on deductive reasoning and

hypothesis testing, this qualitative study was inductive and iterative in nature leading to a nonlinear explorative study design. This type of research was not static, and my role was to document the changes in the research as the study progressed as a result of the feedback from the participants, collection of data, development of themes, and member checking (Yin, 2011).

Relationships with Participants

I did not have a prior personal relationship with the participants. I had never met the teacher participants. As a prior state administrator, I met the district and site administrators in the course of my travels and duties as the digital learning coordinator; however, I did not have a continuing relationship beyond the course of normal correspondence with all administrators state-wide.

Biases

Potential bias due to my classroom teaching, administrative experiences, and coursework in the area of educational technology was addressed and discussed. I used instructional m-learning techniques throughout the course of my career as an educator. During my tenure as an administrator at the state level I lead the design of an online system, delivered training via podcast, video and live teleconference and through authoring and managing web resources. As a researcher I acknowledge the possible bias on my part to consider technology access, use, and implementation in a favorable light due to my own experiences in the field. I was careful during the design and implementation of this study to actively and consistently consider this bias. I asked open ended questions, did not share my own perceptions regarding BYOD and accurately

reported verbatim from the field on the possible concerns and issues conveyed by the participants of this research. Concerns conveyed by the educators included managing devices, behavior, digital citizenship, loss, theft or damage of devices, a wide variety of BYOD hardware and software, lack of direct support and training, and socioeconomic concerns for students without devices. Concerns of administrators included AUP development, assuring adequate district-wide infrastructure; including trunk, access point, router and bandwidth, deployment, communication with stakeholders, providing professional development and support. As participants shared their lived experiences, concerns, attitudes, and perceptions on BYOD I did not interject any of my own experiences, attitudes, or perceptions.

Open-ended interview questions were crafted and used with the intent to uncover any perceived positive or negative attitudes towards the elementary BYOD planning, implementation, and outcomes. Educators and administrators were asked multiple open-ended questions in an effort to provide opportunities to honestly convey both positive attitudes, observations and concerns in a safe and secure manner, as all responses were kept private and confidential (Yin, 2011).

In my capacity as digital learning coordinator at the state I was aware of possible funding streams and the lack of funding encountered by many administrators; so my bias to explore alternate funding streams for the integration of technology was considered and addressed throughout the study. I combated this bias by using open ended questions and allowing respondents to express their own lived experiences, perceptions, and attitudes regarding the perceived financial advantages or disadvantages of BYOD without

interjecting my own opinions or attitudes. I recorded respondents interviews digitally then transcribed them verbatim three times; to assure I did not intentionally omit or misinterpret the responses to eliminate the possible influence of my own biases so as to not color the results (Yin, 2011).

I did not share my views on BYOD prior to, or as I conducted the interviews and observations, but practiced active listening. I recruited the participants to provide feedback on the interview questions and observation protocol prior to implementation of the research to help combat the potential for influence of my own bias (Yin, 2011). It was critical that I engage in self-reflection and, through journaling, I made every effort to identify any limitations and biases inherent in the study that might have colored or skewed the results. The limitations were reflected in my biases, both recognized and unrecognized (Yin, 2011).

Triangulation and member checking techniques were used as the results were tabulated and analyzed to help ensure credibility. These techniques were used so that any bias on my part was acknowledged and did not influence the methodology, collection, and analysis of data and the summary of results.

The criteria used for evaluating the outcomes of this qualitative study were according to Miles and Hubman (1994). Criteria included objectivity and confirmability. These criteria acknowledged any potential bias on the part of the researcher due to prior experiences, attitudes, and beliefs. I established objectivity by requesting participants review, edit and redact data, at their discretion, from the transcribed interviews and observations and final chapters to confirm accuracy of the data collected and findings.

This also ensured that the data and interpretation were relatively free of bias. The interview and observation transcripts were reviewed and approved by all participants without correction, addition or redaction. The second criteria were reliability and dependability, which referred to the stability of results over time and the potential for the same methods to be used by other researchers to replicate the study. The third criteria were internal validity and authenticity, which referred to the credibility of the study to the participants and other researchers. The fourth criteria were the how study outcomes can or cannot be generalized and applied. It included a discussion of the application of study outcomes to the study participants, in addition to the population of administrators and educators external to this suburban Pacific Northwest school.

Methodology

Participant Selection Logic

The potential population of participants for this study included elementary administrators and educators implementing BYOD policy nationwide. It was not feasible to study participants nationwide; therefore, I used a purposive selection of critical case participants from one suburban Pacific Northwest elementary school. The purposive selection of participants consisted of three elementary educators representing Grades K-1, 2-3, and 4-5, and the principal and the superintendent of this suburban school district. This site and this purposive selection of superintendent, principal, and elementary educators was chosen because this is the only suburban elementary school in the area that has a school wide BYOD policy and the infrastructure in place to support this type of initiative, and a 2-year history of a successful implementation.

The definition of a successful elementary school BYOD implementation, for the purposes of this study, was a multiyear (more than 2 year) history of BYOD policy implementation accomplished by an elementary school that had installed all appropriate hardware and software infrastructure necessary; an AUP that allowed BYOD; educators who embraced and have positive experiences implementing BYOD at the classroom level; and administrative, classroom management, technical support, community buy-in, and behavior systems in place to support BYOD.

Selection of Participants

Participants were selected to participate in this study through a purposive selection procedure of educators referred to me by the site level administrator as leaders in BYOD at the Northwest suburban elementary school. Educator participants self-selected into the study via an e-mailed recruitment invitation that included a description of the study; participation requirements; benefits; confidentiality; and a table of study activities with time commitment and contact information, which was sent to all teachers and administrators at the Northwest suburban K-5 elementary school chosen for this study. For a copy of the e-mail refer to Appendix A. The administrators were chosen due to their documented history of a 2-year implementation of BYOD at the elementary school level. Three representative elementary educators at the Northwest suburban K-5 elementary school from the potential pool possible participants and one from each of the grade spans (K-1, 2-3, and 4-5) were selected. Upon participation confirmation via e-mail from the participants, I invited the teachers to schedule classroom observations of

instruction using BYOD. I set up mutually convenient schedules for interviews and observations.

Instrumentation

The initial data collection instrument was a demographic online survey to determine the demographics of the participants. The second data collection instrument was an interview and observation. I provided all participants with the observation protocols and interview questions prior to conducting the observations and interviews. For a copy of the Interview Questions for Educators refer to Appendix B, for Interview Questions for the Site Administrator refer to Appendix C, for the Interview Questions for District Administrator, Superintendent refer to Appendix D. For the Observation Protocol refer to Appendix E. All interview questions and protocols were researcher-produced, designed by me based upon the need for data necessary to answer the main research question and subquestions.

Historical Documents and Online Resources

Data collection also included examining evidence of technology training, professional development on BYOD, and training in behavior management conducted by the district. The district has constructed an online portal for professional development for teachers called the Teacher Toolbox for Learning. For evidence of these sources, refer to Appendix F Technology Page Snapshot Teacher Toolbox for Learning on the district website and Appendix J Copy of the Love and Logic Flyer outlining one of a series of many workshops offered to educators and parents on behavior management, which was extensively used during BYOD implementation at this school site. Also collected was a

copy of the district's BYOD AUP, which defines procedures to be followed by all educators and students as outlined by the district and school to facilitate BYOD and can be found in Appendix G. The permission form used by the district to ensure parental permission for student BYOD participation can be found in Appendix I labeled BYOD Permission Slip. The website and documents can be used not only to document BYOD implementation and practices for this particular school and district, but also to provide an example for reference purposes for those districts and schools wishing to implement their own BYOD policies.

Sufficiency of Data Collection

The sufficiency of data collection including survey, interview and observation is supported because sources and techniques of data collection were designed and directly aligned to answer the research question and subquestions, Data was sufficient to document the perceptions, attitudes, beliefs, and practices of district and site elementary administrators and educators on the advantages and disadvantages of BYOD and AUP policy at this Northwest suburban K-5 school. The data collection instruments and procedures implemented by this study proved sufficient to document the technology infrastructure at the district and school levels, professional development, behavior and classroom management practices, lessons, and other critical information this district and school used to implement an ongoing BYOD policy. The data collection instruments (me, the interview questions, observation protocol, web and hardcopy materials) not only provided data useful to answer the research question and subquestions of this study, but

provided findings that may prove useful to other administrators and educators considering BYOD at the elementary school level

Researcher Developed Instruments

According to Yin (2011) the decision on what to observe and record made by researchers needs to be based upon the consideration of the who, what, when, where, why, and how of the study. These questions address who participated in the study on BYOD and how they became members of the study, what happened during BYOD implementation, when BYOD occurred with a description of the environment where BYOD was implemented, why BYOD was used, what happened prior to BYOD to facilitate it and finally how the BYOD activities were organized. This Qualitative descriptive case study collected and analyzed data from participants from the following sources; online survey, observation, interview, district and site document and website review. The interview questions and the observation protocol were specifically designed to address this research problem statement and to answer the research question and sub-questions according to Yin (2011).

The problem statement and research question was also addressed by collecting and referring to both district level and elementary suburban school site level documents as part of the literature review (as available).

- Written AUP and technology infrastructure in place at the district and school level that facilitated BYOD at this elementary school.

•Technical support and professional development materials, booklets, pamphlets, support records on BYOD that were provided to educators at this elementary school to successfully transition to this AUP.

•Written notices, family letters, permission forms, e-mail and website information or communications or any other disseminated information provided to the parents and community on BYOD at this elementary school and district. References to any citizenship, cybercitizen and Internet safety programs, websites, lessons, resources or curriculum whether accessed virtually or via paper in use at this elementary school to facilitate BYOD.

Procedures for Recruitment, Participation, and Data Collection

I recruited the participants from the pool of teachers at the elementary school via an e-mail invitation and confirmed participation via e-mail. Upon official submission of the consent form, indicating willingness to participate, participants were informed that they could cancel participation upon request at any time during the course of the study and that their responses would be kept confidential. Upon receipt of consent, I administered a demographic survey via Survey Monkey to determine participant's grade level assignment, higher education, and experience levels. All participants selected for this study were certificated employees of the district over the age of 18.

I assigned a pseudonym to each participant which was used to label, save and analyze the interview and observation data. The district and the elementary school were both assigned a pseudonym. None of the names used in this dissertation are the actual names of the participants or the district or school sites. In addition, any information that

could be used to identify individuals or sites has been redacted from the data or findings presented in this dissertation to protect the identity of the participants, district and school.

All participants were provided with the interview questions and observation protocol prior to participation. They were invited to suggest additional questions and topics for discussion during the interviews prior to the commencement of the study. I scheduled the interviews with all three educators and the two administrators through an e-mail invitation. A series of live interviews of all three teacher participants, the site administrator (principal) and the district administrator (superintendent) were conducted at the elementary school and at the district offices. The frequency of the interviews was one interview per participant and the duration of the interviews was from 30 minutes to 1 hour. The frequency of the observations was one observation per teacher and the duration of the observations was one class period of approximately 1 hour per teacher.

The live interviews were digitally recorded then then transcribed by me. The five interviews included open ended questions. Participants were encouraged to add any additional information at the end of the live interview and again when they were provided with the transcription in writing via e-mail. I listened to each digital recording three times and checked the transcription of each interview three times for accuracy and transcribed them verbatim. I then e-mailed the transcripts to the participants for member checking and to allow them to redact or add additional information. All participants declined to add or redact any information or responses. NVivo software was then used to do a preliminary analysis looking for word frequency in order to develop themes and nodes. I also manually coded the themes as I transcribed the observations and interviews using

Word. Themes were identified across all three teacher interviews and observations and across administrator interviews and are further explored and discussed in later chapters. The natural setting is the context of the study in a qualitative descriptive case study. The natural setting of this study was a suburban elementary school of approximately 500 students in grades K-5 located in a large suburban district in the Pacific Northwest. The subject district operates more than 30 elementary schools, each strategically located throughout the district. The buildings vary in age, with the oldest being 50 years old and the newest having opened last school year. However, the district's older facilities are all well maintained and were periodically remodeled over the years to improve efficiency, safety and comfort.

The district's middle schools serve as a bridge for pre-adolescents as they move from elementary to high school. A team approach is used in core classes at Grade 6 to ease the transition from the elementary classroom. Academic emphasis is placed on refinement of basic skills through instruction in traditional subjects as language arts, social studies, mathematics, and science. The curriculum in middle school is expanded to include more opportunities to pursue the fine arts and other elective choices.

Academic excellence is the focus at the district's high schools. All offer a full academic program with courses in basic skills and college-preparatory skills. Intensive instruction in the liberal arts and technical areas prepare high school students for the best colleges and universities and for today's work force. Several of the high schools are all 5-A classification for athletic competition and other competitive programs including music, drama, and debate. They have a rich tradition of winning regional and state

championships and are often recognized for outstanding achievement in music and the arts. Students develop leadership skills through a variety of clubs and extracurricular activities.

The subject elementary school is a recognized center of technology innovation and educational excellence both at the district and state level. The principal hosts visitors on a regular basis from other districts who come to this school to observe best practices in technology innovation.

This study utilized the in-depth interview methodology to gather data from the participants. According to Yin (2011) in-depth interviews are used to provide insight into the personal experiences of the subjects; to uncover detailed accurate information particularly on new phenomena via telling their own stories not by a rigid set of questions. This is accomplished via an unstructured and emerging series of questions that can be adjusted as the interview progresses, so the interviewer can follow the natural course of conversation on any emerging ideas or responses from the subject. In his most recent book, Yin (2015) clarified that the interview protocol should be fluid and unstructured guiding conversation. Although protocol should be followed to facilitate a line of questioning that answers your initial line of inquiry it must carefully balance "level one questions" and level two questions" in an effort to limit bias. Level 1 questions ask, "How?" while level 2 questions ask, "Why?" For some interviewees "Why?" questions may lead to defensiveness. This study focused on the level 1 questions that led to the description of, "How?" educators and administrators implement BYOD at the elementary school level. The natural flow lead to discussion which was a natural back

and forth conversation punctuated with these questions. I designed the interview questions, protocol and conducted the interviews.

Questions for Administrators

1. Describe your school and the demographics of your students.
2. Describe the timeline of events and activities that lead to the adoption of a BYOD policy at your school site.
3. What is your AUP? Is this a district-wide or site specific policy?
4. How do you communicate with parents and students regarding the BYOD policy?
5. What is the technology infrastructure, including access points, network, hardware and software that facilitates BYOD at your particular site?
6. What support, training and information is provided to educators on BYOD?
7. What information on BYOD is provided to families?
8. Describe your experiences with teachers and students utilizing BYOD at your school.
9. What are the challenges of BYOD?
10. What are the advantages of BYOD?
11. What advice can you give to other administrators considering BYOD?

Questions for Educators

1. Describe your teaching assignment and students.
2. Describe the training and support you have received on BYOD.

3. Describe your experience implementing BYOD.
4. How do you organize your classroom to facilitate BYOD?
5. How do you physically manage BYOD devices?
6. How do you communicate with parents regarding BYOD?
7. How do you integrate BYOD into the curriculum?
8. How do you use the BYOD policy to facilitate the Common Core?
9. How do you provide equity for students without devices when implementing the BYOD policy?
10. How do you prevent inappropriate use, cyberbullying and accessing inappropriate content while using BYOD?
11. What character education, school and classroom rules and or disciplinary actions are in place to facilitate BYOD?
12. What are your perceptions regarding BYOD implementation in your classroom?
13. What are the challenges of BYOD?
14. What are the advantages?
15. What advice can you give to other educators considering BYOD?

All Word and digitally recorded files were saved to the researcher's computer hard drive (not a shared drive) and to the "cloud" and are accessible via a password protected log in screen solely by me. Paper versions of all data and documents were stored in a locking file cabinet accessible only by me. All data including recordings,

documents, interview and observation transcripts and any digital files will be saved for 5 years in both digital and paper formats.

Participating educators were requested to invite me into their classrooms at their convenience for an observation to demonstrate their classroom management, citizenship, instructional techniques and integration into the curriculum of the devices brought to school as a result of the implementation of the BYOD policy. Educator lessons and any instances of administrators enforcing policy and management constituted the observations. Detailed notes were taken of each participating educator as they taught students via BYOD. Educator and administrator interviews were audio digitally recorded but the classroom observations were not digitally video or audio recorded due to the lack of parental permission. All audio digitally recorded interviews and observation notes were carefully transcribed then entered, coded and analyzed. Participants exited the study upon successful completion of the survey, interview, observation (of educators), and the final review of transcripts of interviews and notes of observations for member checking and triangulation purposes. All original participants completed the study activities. A copy of the final dissertation will be provided to school site level participants and district administration upon publication.

Data Analysis Plan

According to Hahn (2008) there are four levels of coding involved in qualitative research. Level I is the initial coding or open coding where large amounts of raw data are initially organized through labeling. The second step, Level II coding, enables the researcher to further categorize and focus the data. The third step is Level III or axial

coding that leads the researcher to further define emerging themes. The fourth and final step is the development of theory if appropriate.

Coding for this study at the Level I stage included transcribing recorded interview and observation data. The first stage also included organizing and collecting field notes, documents, and virtual resources. Level 1 coding was done in Word while Levels 2, 3, and 4 coding was done via both Word and NVivo. These levels of coding provided the answers to the research question for this study and provided data for integration into the final summary of results.

Coding involved a process of assigning key words to various data obtained from all study sources including interview responses, observations, documents and field notes in order to record, categorize and analyze results according to themes. This coding process lead to the identification of various nodes and themes that in turn lead to the development of other nodes and themes resulting in adjustments to the research in progress and continually informed results.

Documents were collected during the course of this study as a component of the data gathering process after Institutional Review Board (IRB) approval to provide information regarding the infrastructure and policies in place at the district and the elementary school level that have facilitated the BYOD initiative. These documents included; the official technology AUP at the district and school site levels, infrastructure plans, and communications and training/support materials provided online and in print to the administrators, educators, parents and the community on BYOD.

According to Yin (2011) recording is selective and influenced by the bias of the researcher as it is nearly impossible to record everything. I kept a diary of field notes to record the events, took notes during interviews and observations to document and self-reflect upon my own perceptions, feelings and beliefs as the study unfolded. Field note records are meant to provide a literal and accurate account. The framework of the records included the following; descriptions of the; settings, activity, actions, events, time, goals and feelings. The written record began with key words and phrases that was later expanded into themes. I documented, not only the details of the events, but also insights, themes, ideas, my own personal reactions to the events, and the changes in my views as time unfolded. This formed the basis of tentative themes and findings and was refined as the research unfolded.

The data analysis was extensive and according to the methods outlined in the books *Qualitative Field Research* by Yin (2011) *and Case Study Research* by Yin (2014). It consists of a thorough description of the participant selection process. For this study it included critical demographics including age, gender, teaching assignment, education, certifications, years of teaching experience, and work history. This was followed by the data processing that involved ordering and coding the data. After each session the field notes were expanded into a more thorough well written description including what was observed and my own thoughts and comments. Then this text was organized under appropriate headings and labels, as coding the data ensued. Summaries of the coded data were created to assist the reader in understanding and interpreting the results. The first step in summarizing the data was to list all data under clear headings and then present the

data in tables according to word frequency to organize the data according to; demographic data, responses to research questions and observations. The second step was to draw conclusions by looking for relationships between the variables. The third step was to confirm the findings by checking for representativeness of the data, bias, evidence from other sources, comparing and contrasting data, and getting feedback from the participants. The final step in this study was to explore further questions that this research study suggests.

Issues of Trustworthiness

According to Yin (2014) there are 4 tests to establish the quality of a study. They include trustworthiness, credibility, confirmability, and data dependability.

Credibility

Credibility was established through member checking and was established on all interviews including the three teachers, the principal and superintendent and classroom observations of the three teachers by providing the transcribed observations and interviews via e-mail and asking participants to review for accuracy and add any additional information that would help to clarify their responses to the interview questions.

Transferability

According to Yin (2014) transferability is supported by the asking of "how" and "why" questions. This study included a variety of participants including district and site administrators and multiple grade representation from three grade spans and a variety of interview questions for both administrators and educators on the "how" and "why" of

BYOD. Transferability is also supported by thick description of the demographics of the Pacific Northwest suburban elementary district and school, through the observations and interviews providing information for the field from which a decision can be made if the findings of this study can be transferred and used to inform the consideration of BYOD AUP policy and implementation in elementary schools.

Dependability

According to Yin (2014) dependability of study findings are related to the ability of another researcher to replicate this study using the methods specific to this study's qualitative descriptive case study design. This study included a thorough and detailed documentation of the methodology used to include the actual interview questions, observation protocol, and an extensive audit trail. This audit trail included a detailed description of the research steps and records kept which can be used by another researcher to replicate the study.

Confirmability

The issue of confirmability was addressed through the discussion, recognition and consideration of potential researcher bias throughout the design and implementation of this research study.

Ethical Procedures

The proposal, interview and observation protocols including interview questions were provided to the superintendent and principal prior to study commencement. A letter of cooperation to conduct this study dated November 19, 2014 was received from the

district Research and Special Projects Coordinator and signed by the district Superintendent via e-mail on December 15, 2014.

I took the course on treatment of human subjects required by the IRB, passed the exam, submitted all materials and the IRB approved me to conduct the research on April 24, 2015. According to IRB guidelines on the treatment of human subjects, all participants are over the age of 18 and the identity of the district, school and all participants were kept confidential to protect their identities. All names published in this dissertation including the Whitefield School District, Sierra Elementary School, and the participants' names are pseudonyms. The true identity of the school, district and proper names were blackened out in all documents located in the Appendix of this dissertation. See Appendices A, B and C.

All files were saved to the researcher's computer hard drive (not a shared drive) and to the "cloud" and are accessible via a password protected log in screen only by me. Paper versions of all data and documents were stored in a locking file cabinet accessible only by me. All data including recordings, documents, interviews and observation transcripts and any digital files will be saved for 5 years in both digital and paper formats.

The URR approved the proposal for this study on July 14, 2014 and the Walden Institutional Review Board (IRB) approval for this study was received on April 24, 2015 (IRB Approval Number 04-24-15-0163416).

Participants were informed at the outset that they could withdraw from the study at any time for any reason at their discretion without consequences. There were no

withdrawals and all participants completed the study interviews and observations as stated in the proposal and protocol.

Summary

This chapter described the descriptive case study methodology used to conduct this study and to answer the research question and sub questions. The methodology included the approval process, research design and rationale, the role of the researcher, methodology, participant selection logic, instrumentation, procedures for recruitment, participation, data collection, issues of trustworthiness, and the ethical procedures used to conduct this study. Chapter 4 presents the setting, demographics, data collection, analysis, evidence of trustworthiness, and data in relation to the results and findings.

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Chapter 4: Results

Introduction

The purpose of this this descriptive case study was to present findings to answer the main question of this research: How does the phenomena of a BYOD policy instituted at one suburban US elementary school site meet the need to provide increased access, use, and integration of mobile technology aligned to the CCSS and ISTE Standards? This study also presented findings to answer these subquestions.

- What are the district and site administrator's perceptions of and attitudes towards BYOD?
- What are the educators' perceptions of and attitudes towards BYOD?
- What BYOD classroom management and instructional techniques are used?
- How are the students using BYOD?

In this chapter, I outline the setting, demographics, data collection and analysis, evidence of trustworthiness, and the results of this study.

Setting

In this study, I documented a BYOD initiative at one Pacific northwestern suburban K-5 elementary school, located in a large school district, recognized for its innovative technology initiatives. I shed light on district and school BYOD policy, elementary administrator and teacher practices, beliefs and attitudes, and recommendations from study participants for the field of elementary teachers and administrators considering BYOD. These findings were based upon interviews of 3 elementary teachers across the grade spans K-1, 2-3 and 4-5, one elementary principal,

the district superintendent, and observations of all three educators. The Northwest suburban elementary school selected for this study, hereafter referred to as Sierra Elementary School, serves several hundred students in grades Kindergarten through fifth grade. All names used are pseudonyms. Sierra Elementary School's free and reduced lunch is an indicator of its poverty rate. The school employs fewer than 20 classroom teachers. It has both a special education and extended special education programs, and it employs a part-time counselor. There are no mentors or specialists on site other than the computer teacher. This site was selected for this study because of its history of technology innovation, reputation for its leadership technology by the principal in the area of technology, and its status as an early adopter of a policy allowing BYOD.

The Northwest suburban district in which the elementary school resides, hereafter referred to as the Whitfield School District, encompasses a large geographic area. The Whitfield District is known for its innovative technology practices. Superintendent D is also well known for his forward thinking leadership, having served as the superintendent for several years. He is active at the local and state levels.

Three educators self-selected into the study via an invitation e-mail sent to all teachers at the Sierra Elementary School and were chosen for this study. They were selected as representatives of three grade spans. The sample included one representative from each of the following grade spans: K-1, 2-3, and 4-5 for a total of three teacher participants. Two administrators also self-selected into the study and received their invitations and consent forms via e-mail. They included the site administrator of the Northwest suburban elementary school, Ms. B, principal of Sierra Elementary School,

and the district administrator of the Whitfield School District in which the school is located, Superintendent Dr. D.

Demographics

The pool of prospective participants included all teachers at Sierra Elementary School. All teachers received the Invitation to Participate e-mail and consent form approved by Walden University's Institutional Review Board, and three teachers self-selected into the study. Teacher demographics were collected via a Survey Monkey survey link sent in an e-mail, prior to the scheduled observations and interviews. The demographic data gathered via survey of the teacher population, as represented in Table 1, revealed that all participants were white, female, and from the following age ranges: 51-56, 46-50, and 31-35. One teacher participant earned a bachelor's degree plus post graduate credits and two earned graduate degrees (M.Ed. M.S. etc.) with one reporting postgrad course work. Participants had from 1 to 3 years of BYOD experience.

Table 1

Teacher Demographics

Questions	Ms. S	Ms. A	Ms. T
Gender	Female	Female	Female
Ethnicity	Caucasian	Caucasian	Caucasian
Age Range	51-56	46-50	31-35
Highest Degree	Graduate Degree (M.Ed.) Plus Post Graduate	Graduate Degree (M.Ed.)	BS Degree Plus Post BS
Grade Level Range Representation	K-1	2-3	4-5
Grade Level Assignment	1	2	5
Certification/s	Ele. Generalist Special Ed. K-12 Reading K-8 Psychology Health French	Multiple Subjects K-8	Multiple Subjects K-8
Teaching Experience BYOD Experience	16-20 yrs. 3 yrs.	11-15 yrs. 1 yr.	1-5 yrs. 1 yr.

Observations and interviews were held at the participants' convenience at Sierra Elementary School, the northwest suburban elementary school. Observations and interviews were conducted during the spring and summer of the 2014-15 school year. Interviews with educators were conducted subsequent to the observations. Interviews with administrators were conducted after the 2014-15 school year ended.

Data Collection

There were four sources of data collected including a one-time online survey of participant demographics, teacher observations, and teacher and administrator interviews.

Interview data were collected from five participants including three teachers representing three grade spans: K-1, 2-3, and 4-5, the principal of the K-5 elementary school, and their superintendent in a Pacific northwest suburban school district. Interviews were conducted by me at a frequency of one interview per participant for a duration of from 45 minutes to 1 hour. The interviews were recorded via an auditory only digital recording using a Samsung recorder. I also took field notes in a digital journal during and after the interviews. These interviews were transcribed by replaying each digital auditory recording of the interview three times and transcribing the content in Word verbatim on my computer.

The three teachers were observed by me teaching classes incorporating BYOD practices at a frequency of one observation per teacher for a duration of 1 class period. These observations were not recorded or videoed due to the lack of parental consent. I took extensive notes during the observation according to the observation protocol.

There were no variations in data collection from the plan presented in Chapter 3 or unusual circumstances encountered during data collection.

Teacher Observations

The BYOD lesson observations were done in the elementary classrooms of the teachers at the prearranged times as displayed in Table 2. The frequency of observation was one per teacher, and the duration was one class period. The teachers were all requested to invite me to observe a lesson in which they incorporated student BYOD. I did not request a specific content area. Components of the observation included classroom description, teacher direction, interactions with and between students,

instructional activities and materials, technology hardware including number of BYOD, applications and Internet sites used during the lesson, classroom organization, the behavior management system and instructional techniques employed. These elements comprised the content of the observation and were noted in Microsoft Word during the observation on my notebook. The observations were not digitally recorded or videoed due to lack of parental permission to record or video. After the initial note taking that occurred during the lesson, I subsequently added details and further descriptions. I submitted a transcript of the observation to each of the participating teachers via e-mail for checking and reminded them they could redact, correct, or add any additional information. All teachers reviewed the transcript of their own observation and approved it without any corrections or additions. In Table 2, data are displayed indicating the: pseudonym, grade level, and date each participating teacher at Sierra Elementary School was observed teaching a lesson which incorporated BYOD.

Table 2

Participant Observation Dates

Participant	Grade	Observation Date
Ms. S	1	May 19, 2015
Ms. A	2	May 29, 2015
Ms. T	5	May 15, 2015

Interview Data Collection

In Table 3, data are presented regarding the date of each of the teacher and administrator interviews and the roles of the participants.

Table 3

Participant Interview Dates

Participant	Role	Interview Date
Ms. S	Teacher	May 20, 2015
Ms. A	Teacher	June 11, 2015
Ms. T	Teacher	June 5, 2015
Ms. B	Principal	June 22, 2015
Dr. D	Superintendent	July 20, 2015

The interviews were conducted in the teachers' classrooms, faculty lounge, or administrator offices at the interviewees' convenience on mutually agreed upon dates from May through July of 2015. Teacher interviews were conducted after school hours so teachers were not under pressure due to the school schedule or lunch time constraints and did not require a substitute. The administrator interviews were conducted after the school year ended due to their demanding schedules. The teacher and administrator interviews lasted from roughly 45 minutes to no more than 1 hour. I initially welcomed each of the interviewees and engaged in small talk to create a relaxed environment. All participants appeared unhurried and comfortable, and I noted their unanimous willingness and enthusiasm to share their expertise with the field. I informed them I would be recording the interview and that I would then transcribe it and submit the transcription to them for checking. I instructed them that they could, at that time, redact responses, correct any errors, and add additional information. I then followed the interview protocol and asked the interview questions approved by the Walden IRB. The interview was not scripted as the initial structured questions were asked, but these questions also led to discussion and unstructured conversation that I also recorded and transcribed. Throughout the

interviews, I attempted to use active listening by restating the interviewee's responses and encouraging them to elaborate and further explain and tell their stories. I also attended to their nonverbal clues to help determine the course and interactive nature of the interview.

Data Analysis

The process used to move inductively from coded units to larger representations began with the analysis of observation notes and interview responses according to word frequency and response categories according to interview questions. I then progressed to response categories to answer the research questions. These processes were interwoven throughout with the majority of categories and themes relating directly as noted in the observations, interview questions, and their corresponding themes as they became evident and appeared across participants. In Table 4, the observation of the lesson was transcribed in Word, then queried and analyzed by NVivo software to determine the frequency of words.

Table 4

Teacher Observation Word Frequency

Word	Count	Weighted Percentage (%)
Students	103	4.82
Devices	44	2.06
School	23	1.08
Working	20	0.94
Apps	19	0.89
Room	18	0.84
Class	17	0.80
Station	16	0.75
Work	16	0.75
Tables	15	0.70
Stations	14	0.66
Table	14	0.66
Hands	12	0.56
Lesson	12	0.56
Log	12	0.56
Brought	11	0.51
Device	11	0.51
Slam	11	0.51
Technology	11	0.51
Directions	9	0.42
Seated	9	0.42
Shared	9	0.42
Teacher	9	0.42

Interview Data Analysis

I recorded the interviews on a handheld digital recorder and then listened to the recordings three times each to ensure accuracy as I transcribed them verbatim into Microsoft Word. I submitted each interview transcript to the participants via e-mail for their review and approval. All participants approved of the transcribed interviews via e-mail without redaction, correction, or addition. I then removed my quotes and consolidated their responses in a Word document. The interview questions were used to provide a framework of coding and developing the themes. They were also used for

reporting a summary of results across the teacher respondents and across the grade spans. I entered each transcript into NVivo for analysis.

The interviews were initially coded in NVivo as nodes corresponding to the initial themes derived from each of the interview questions. Then the individual theme nodes were queried and compared across participant responses to further develop child nodes and other themes. Then data was queried for commonalities that appear both linearly across all teacher responses related to specific themes, and frequencies of occurrence throughout the answers to the series of questions posed to each participant. The frequencies were queried via NVivo's word frequency count to determine the highest frequency words and graphically represented in word frequency via NVivo. These frequency tables drew attention to the attitudes, beliefs and practices through critical themes and nodes including BYOD devices, Love and Logic, access to technology in the classroom, district, parent and teacher tools, expectations, training, information, website, management, and instructional practices.

Table 5

Teacher and Administrator Interview Word Frequency Tables

Word	Count	Weighted %
Devices	124	1.49
School	101	1.21
Byod	92	1.10
Device	84	1.01
technology	62	0.74
classroom	53	0.64
District	47	0.56
Love	42	0.50
Logic	38	0.46
Access	37	0.44
teachers	36	0.43
Parents	27	0.32
Schools	26	0.31
Network	24	0.29
Tool	22	0.26
elementary	20	0.24
expectations	18	0.22
iPad	18	0.22
Guest	17	0.20
information	17	0.20
Problem	15	0.18
Training	14	0.17
Website	14	0.17
Manage	13	0.16
curriculum	12	0.14

Initial coding involved accurately associating high frequency words to generate themes which were identified across all participants for both observation and interview data. Themes became evident when responses to interview questions were examined for both teachers and administrators as individuals, and teachers and administrators as groups. Themes also emerged from the coded data across observations of the three

teachers. Themes were identified through word frequency data, manual coding and were correlated to the research question, on attitudes, perceptions and practices conveyed by participants as noted during the interviews and observations. This helped to initially identify a sample of the emerging themes which were then later expanded upon by manual coding. They included: students bringing their own devices, working together, stations, hands on lessons, apps, logging on and sharing.

Evidence of Trustworthiness

According to Yin (2014) there are four tests to establish the quality of a study. They include trustworthiness, credibility, confirmability, and data dependability. Also according to Yin (2014) three methods to increase construct validity include; using multiple sources of evidence, establishing a chain of evidence and to provide a draft to the participants for review. Throughout this study multiple sources of evidence were collected including survey, observation, interview, online resources and documents. The chain of evidence has been clearly documented and drafts of all interviews and observations were presented to participants for review.

Credibility

Credibility was established through member checking. Credibility was established on all interviews including the three teachers, the principal, superintendent, and classroom observations of the three teachers. I transcribed the digitally recorded interviews verbatim and reviewed my own notes and recordings three times to assure accuracy and completeness. I performed member checking. All participants were e-mailed transcripts of their own interview and observations and asked to redact or add any

additional information prior to inclusion in the data pool. All participants reviewed the interviews and declined to redact or add any additional information. The participants themselves provided credibility of the data through member checking.

Transferability

According to Yin (2014) transferability is supported by the asking of "how" and "why" questions. This study included interview questions for both administrators and educators on the "how" and "why" of BYOD. Transferability of the study findings is limited due to the qualitative descriptive case study design and the sampling method employed, such that findings shed light on the implementation of BYOD in other suburban elementary schools. However, the findings may be useful on a nationwide or international level. It is acknowledged that these findings may be most useful only to other elementary schools most similar to the demographic characteristics of the elementary school chosen for this study. It is also acknowledged that there are findings not specific to the demographics of the subject school that may inform the field at large in terms of using data to inform administrative decision making. Findings on the design and implementation of BYOD AUP and findings regarding the implementation of BYOD at the elementary school level may provide helpful information for administrators nationally and internationally. Study findings may also be helpful to inform BYOD instructional and behavior management practices in elementary school classrooms nationwide and internationally. Findings can be used to inform and guide further research.

Dependability

According to Yin (2014) reliability is supported in case study research by the potential for another researcher to follow the protocol of the study and arrive at the same findings. Dependability of study findings are related to the ability of another researcher to replicate this study using the methods specific to this study's qualitative descriptive case study design. This study included thorough and detailed documentation which could be used to design replication of this research including identification of the research questions, purpose, problem, sampling procedure, demographics of the subject school, district and participants. Data collection methods including interview and observation protocols and interview questions were well documented. The study methodology outlined data analysis including identification of themes, coding and data analysis that can be used to replicate the study. These methods could be used to replicate the study of the same research questions with different or similar but not exact participate and site demographics.

Confirmability

Confirmability was established through the discussion and the recognition of potential bias of the researcher. Bias was a consideration throughout the design and implementation of the research. Bias was controlled by asking open ended questions that did not lead the participants to respond in a specific way and not sharing my own attitudes and beliefs regarding BYOD prior to or during data collection. Confirmability was also addressed when member checking was performed because the participants had

the opportunity to share if the responses to the interviews or observation data had been misinterpreted due to the bias of the researcher.

Results

Classroom Observations Setting Description

The classroom observation setting description included the physical layout of the classroom, seating arrangement, the number of students present and the technology available for use by students and teachers. All three teachers used collaborative seating arrangements where students were seated in pairs or groups. The teachers encouraged students to seek help from each other to work together. None of the classrooms had individual desks for students.

Setting description Ms. S first grade. I was seated on the left side of the classroom at the back. There were six rectangular tables with three-four students seated at each table. There were 23 students altogether present, 14 students brought their own devices and nine used the school devices or shared with those who brought them.

Table 6

First grade Classroom Devices

Number and Type of Devices	
# of Students	23
# of BYOD	14
# of school devices	9

Setting description Ms. A second grade. I was seated on the left side of the classroom. Students came in from recess. There were 23 students present. Students came in and sat at tables of six or at small pentagon tables to the sides of the room. The room

was set up in a U shape with five long tables. Students worked in pairs on one device per pair.

Table 7

Second grade Classroom Devices

Number and Type of Devices	
# of Students	23
# of BYOD	3
# of school devices	9

Setting description Ms. T fifth grade. I was seated at the left side of the classroom near the door. Students are seated in groups of five or six at round tables. There were 33 students present and 15 brought their own devices. The students just finished their indoor recess as I walked in and they were scattered across the room at their tables engaged in various activities. Each was working on their own devices with 15 BYOD and 12 school devices.

Table 8

Fifth grade Classroom Devices

Number and Type of Devices	
# of Students	33
# of BYOD	15
# of school devices	18

Materials and device management in all three classes. All three teachers allowed students to keep their own devices in their backpacks that were hung on hooks in the room, not in the hallway, and took the devices out as needed. Students placed them on

their tables where they worked on their assignments and put them away in their backpacks when the lessons concluded. The fifth grade teacher allowed students to keep their cell phones in their pockets and set both cell phones and other devices on the table or allowed students to carry them from station to station throughout the lesson as needed. All three teachers had classroom devices that could be used if a student did not have their own device. According to a first grade students, "I keep my device on my desk." Another student indicated, "I keep my iPod in my backpack." (personal communication, May 20, 2015).

All three teachers designated an area for the storage of school devices in the classroom either a cart, bookshelf or rack. All three permitted students to have free access to their own and the school's devices as needed without asking permission or signing them in and out. All three classrooms had charging stations or areas where outlets were available for charging both school and student devices, whenever needed, without asking permission to do so. Students who brought their own devices were permitted to use their own chargers. I did not witness any students specifically asking to get or use a device or charge their device. They had all been trained to follow procedures about when and how to access the technology and it just flowed seamlessly as students retrieved the materials they needed as necessary, including the technology tools either BYOD or school devices for the lessons.

I was informed multiple times by teachers and the principal that there is a school-wide policy that students may not put devices on the floor, as they might get stepped on. Water bottles must be off the tables when students work with technology and devices do

not go out to recess at all. These rules were followed without reminders or incident. All students in all three classes used their technology appropriately without intervention or redirection from their teachers.

None of the three teachers sat down during the observed lessons as they walked from table to table. All three worked directly with students throughout the lessons; clarified expectations, assisted with the technology, provided individualized instruction, gave feedback on the students' projects and assignments, monitored progress and appropriate use of the device and Internet. I noted that there were no instances of inappropriate use of the Internet during any of the lessons and all three teachers reported inappropriate use of devices or accessing inappropriate content was not an issue in their classrooms. In all three classrooms the behavior management system Love and Logic is credited for providing a foundation of respect for any type of personal or school property, BYOD or otherwise.

Materials and device management Ms. S. Ms. S asked, "May I have a volunteer to get the buckets?" and instructed the students to, "Please return to your desks" (personal communication, May 20, 2015). Students returned to their desks where they were seated at tables of four and they took out their devices. Some students took their own devices out of their backpacks while others took the school's devices off of a bookshelf and storage rack designated for that purpose.

Materials and device management Ms. A. The students set up their devices, took out their booklets and began to log in. They worked at their own pace during this lesson and were all at various stages of entering app names, descriptions and drawing the

icons referring to the apps list and sample. Students had their devices out on their desks and worked on their Summer Apps Booklet. Students who brought their own devices retrieved them from their backpacks. Three students brought their own devices today. Ms. A shared, previously four students brought their own devices earlier in the week.

The Summer Apps Book was a project for students to complete on various apps. The applications list was posted on the white board at the front of the class and below this horizontal list of apps was the user name and password for each. Ms. A handed out small booklets printed on both sides of copy paper. They had a lined space at the bottom of the page for students to write on and a blank square for students to draw the app icon at the top. A sample booklet was displayed via the doc camera located on the teacher's desk and the projector mounted in the ceiling. It projected the image of the sample on a projector screen at the right front of the room beside the horizontal list of apps.

Materials and device management Ms. T. Students returned to their tables to set them up for SLAM (science, language arts and mathematics) rotations. They retrieved their supplies from the materials shelf and their BYOD devices out of their backpacks, pockets or school devices from the technology shelf where they were stored. Some students already had their BYOD on their desks. Each table was assigned a different SLAM station. Ms. T had clear plastic recipe holders inserted with the assignment sheets for each station with complete activity directions including the; Learning Target, Tools, Procedures and a rubric. The directions for each assignment on their tables was clearly delineated in handouts too for students to have their own individual copy for their notebooks. Students had their SLAM notebooks out. These were three ring binders that

students had been working on all year: collecting SLAM assignments, work products and rubrics.

Logging on student support for applications and sites in all three classes. All three teachers established various methods for providing support for students to log onto the variety of applications and sites designated by their assignments. The first grade teacher supported her students, reminded them how to request assistance then had them get out their Log in Folders. These folders had the directions for log in password and user name for various applications and Internet sites that she used frequently with them. The second grade teacher had the sites and log in information displayed on the board via a doc camera. The fifth grade teacher had clear recipe holders holding a handout with the complete assignment instructions for each table including; the websites' address, applications and materials needed. The fifth grade teacher also had these handouts printed for each student and had student notebooks where students saved all SLAM rotation assignment handouts including websites etc. Students were not expected to memorize the log ins and passwords in the younger grades. Students all worked in groups and pairs throughout the lessons and had been pre-trained to request help from their neighbor if they were experiencing technical difficulties before requesting assistance from the teacher. The classes all exhibited appropriate voice volume as students worked together collaboratively. They were obviously all well trained in behavior expectations prior to the lessons observed, as no major behavioral incidents were noted during any of the classroom observations.

Logging on student support Ms. S. Ms. S told the class what was difficult about managing the devices for her. Ms. S prompted them to vote and said, "It's hard for me to get around to everybody. Hands raised when you need help? Or Children following me around? I promise I will get to each of you and if you need help please raise your hands" (personal communication, May 20, 2015). All students raised their hands indicating that they knew she preferred hands raised.

Students at stations, that required technology, logged onto the devices. Ms. S traveled throughout the room assisting students to get onto the school's wireless network. Several students needed help but they patiently waited with their hands raised. Eventually Ms. S worked her way throughout the class troubleshooting devices and logins until and they were all logged on successfully!

Ms. S showed me folders she created for her students that had the directions for log in for various applications and Internet sites that she uses frequently with her students. The students had the log in name and password for every application they used mounted in these manila folders. The students who used technology for their centers, took out these folders and accessed them to log into the application for their center. If they needed help, they requested help, first from their center partner. If they continued to have difficulty, and neither child could figure out how to log in, they raised their hands and Ms. S traveled throughout the room to assist. Ms. S did not sit down during the course of the lesson as she constantly traveled throughout the room monitored stations, technology and hands-on. She patiently and continually offered assistance, feedback and engaged students.

Logging on student support Ms. A. Ms. A worked with pairs of students to assist them to log onto the various apps and students helped each other. Students asked the teacher questions regarding log in and accessing the devices and apps, as she traveled throughout the room to each table.

Logging on student support Ms. T. The fifth grade students had the Plexiglas recipe holders at their stations which held handouts. They used these handouts at each table, and their notebooks to refer to and access the sites necessary for the stations. They logged on independently as they had used them previously

Lesson design for BYOD observation all three classes. Two of the three teachers for first and fifth grades used stations in their lesson designs, incorporating BYOD as a tool used to complete various activities and produce products. The second grade teacher used a combination of partner and individual work on a whole class assignment. All three teachers used a collaborative work and shared model of learning that encouraged student interaction and peer support throughout their lessons. The first grade teacher set up a language arts rotation where BYOD was used as students traveled throughout the room to work on myOn Reading, Spelling City or recorded themselves reading a poem or story and hands on activities. Each station had technology already set up, but students were welcome to utilize their own devices. The fifth grade teacher used the SLAM stations and shared rotation with a neighboring fifth grade teacher's class so students were not only moving around the room to stations but were moving in and out of the neighboring classroom. The chart of 12 stations and the students assigned to the stations was displayed at the front of the class via the Smartboard. All students

uneventfully traveled to and from their assigned stations working collaboratively to complete their projects without redirection. The teacher was available to provide feedback and assistance but the students independently worked at tables, retrieved materials and turned in their projects.

Lesson activities - stations Ms. S. Ms. S said, "Remember we are in research mode this week" (personal communication, May 20, 2015). Students were now seated at their stations. At one station students had yellow sheets on their desks and they were logged onto Spelling City. I observed students finishing their spelling station then using their devices to access myOn Reading. A student explained is a site where you can listen to stories. He listened to an ocean story. Other students were seated at a station where they used their iPod and iPad to record themselves reading a poem out loud.

Students finished up their first station and transitioned to the next. Ms. S transitioned them by saying, "We were on one, now we are on two" (personal communication, May 20, 2015). She repeated this several times directing them to the next center. Students moved without incident to their new stations. A group of students came into the room and joined in the rotation. They seemed to know exactly where to go

Lesson activities - partner/ individual work Ms. A. The students wrote directions on how to access the applications listed on the board including; Brain Pop Jr., TumbleBooks animated talking picture books, ScootPad program for learning according to the CCSS, MobyMax personalized learning and myON reader that personalizes reading by recommending books based on student interests, reading level, and ratings. The students completed pages in their Summer Apps booklets where they drew a picture

of each of the apps with markers and crayons, copied the web addresses and had a space to write directions on how to access them. They wrote what the app does, their ideas and experiences with the sites and applications. Ms. A created a frame included in the sample booklet that was also displayed at the front of the classroom.

My Summer Apps Booklet

Title,

First,

Next, log in. Use the

User name_____ and the password _____.

Then,

Students worked at their tables on their devices, whispering quietly and discussing apps, sharing their own devices (three) with their partners or sharing the other (nine) iPads that belong to the school.

Lesson activities - stations Ms. T. Ms. T called class to order, introduced me and announced, "We are doing SLAM today. SLAM stands for social studies, science, language arts and mathematics. It is held every Friday and is designed as a review of skills and knowledge already taught or research and activities to support instruction" (personal communication, May 20, 2015). Ms. T assigned stations and reviewed the rules for participation including, "Student assignments must be edited and self-graded according to their rubrics" (personal communication, May 20, 2015). Students were ready to participate, sat quietly, listened to the teacher with all materials and devices ready. Each table had all supplies for doing the tasks that students were free to collect

from the materials area of the classroom on their own as needed. Each station was equipped with a directions handout complete with all websites and finished with Questions to Ponder as an extension activity.

Some activities were tech based and required Internet research or accessing various sites so students were accessing the Internet on multiple devices (15 of their own and 18 school devices) on multiple sites throughout the lesson including;

- Biography Research Google Search
- Influential People Google Search
- Stack the States - students go to the Stack the States website
- Westward Expansion - sites: www.ducksters.com, www.brainpop.com and www.factmonster.com
- Other stations were paper based like Battle Ship where students plotted coordinates on graph paper or creating Civil War battlefield mural out of various polygons tying in math.

Device management and consequences (Love and Logic) all three classes. In Ms. S's class, a first grade student shared, "If we use it like a tool then we keep it, if you use it like a toy then you have to put it in the toy box" (personal communication, (He pointed to a colorful wooden box labeled "Toy Box" by the door) You don't get it back until Friday. The toy box is for tools that we don't use right." The class worked independently for approximately 20 minutes with little intervention from Ms. S after beginning their stations, other than to route them to the next station, then check on each station as she walked throughout the classroom. After they were logged in the students using

technology were able to navigate independently and supported each other. The room buzzed with quiet conversation and interaction over each station. Even some of the technology stations provided conversation opportunities for digital recording and oral reading.

It was obvious across all three observations that routines and behavior expectations had been established. Students were not observed to use the technology in any inappropriate ways and did not require multiple redirections or enactment of consequences during this observation, other than one minor incident in the second grade classroom. This incident was a result of hurt feelings rather than inappropriate use.

Ms. A's class used pre-taught routines for behavior expectations, for example appropriate voice volume as the lesson progressed. Ms. A directed the class, "If you can hear my voice please touch your ears. Reminder that, it is a little loud to my ears, your voice needs to be soft so we can hear. Focus, focus" (personal communication, June 11, 2015).

Only one very minor behavior redirection was noted during the course of all three observations. It occurred during the second grade observation. A boy was crying very softly, almost imperceptibly to the other students around him, as they continued to work. This student raised his hand to get Ms. A's attention and said, "He was braggy and making fun of me". He referred to his partner. Ms. A approached the table and very calmly asked the other student to be more helpful. They were asked to work together on a solution and take materials into the hall if they could not work quietly. They picked up their device and went to the hallway where they immediately continued to work together

cooperatively without incident. Most of the class, other than the two students working in their immediate vicinity, did not notice and continued to work as the redirection was done very quietly.

Notes on device management. At the end of the lesson, Ms. S said, "Bodies frozen. Please make sure your tables are completely clean and quiet to line up. Bodies frozen. I am looking for the quietest table" (personal communication, May 20, 2015). Students returned their devices to the cart or to their backpacks, straightened up their centers and put away all of their materials and then settled. Ms. S began to line up students by calling tables as they were cleared.

As an observer I could not tell who was working on their own device and who was working on school devices. All devices were shared in the first and second grade classes. In the fifth grade class, there were enough devices for everyone to have their own BYOD or the school's devices. As new students came in and sat down they shared the school devices already on the tables or they were permitted to travel with their own devices throughout the SLAM sessions. Ms. T shared, "Students who bring their own devices keep them in their backpacks or on their desk and use them when they want to. If they do not use them appropriately they lose the privilege for the year, no second chances" (personal communication, June 5, 2015).

A fifth grade student in Ms. T's class walked over to where I was seated and introduced himself while the rest of the class prepared for the lesson. I asked him to tell me about using your own device at school and he told me about how devices are

managed, what the routine is and how they are disciplined if they do not use them appropriately He said,

> Everyone knows about the rules and what sites they are permitted to go to. We are responsible for our own devices and technology use and if we don't use them right we lose them and we never get to use them again (personal communication, June 5, 2015).

Ms. T monitored the students continually and the students themselves monitored their peers so she did not have to do a single redirect during this observation. They were all on task.

Student assistance lesson Ms. A. Ms. A provided individual assistance, checked in with individual students, sometimes suggested they switch apps and reminded them to describe how the apps worked in their booklets. The students were independent and worked without incident together. Ms. A walked to each table and make suggestions to fill out the table of contents, write one more sentence and describe how the app works.

Student support for lesson content Ms. A. Ms. A provided students support by working with small group and asked if everyone was working on their icons, reminding students to use the frame to draw. She then worked with another table reminding students to use capitals.

> Don't forget to write your title in capitals. Remember to double check for spelling. Don't forget the cover and decide on what your illustration will be. Can you check yours and show me some details please? Check how you spelled that

word. What goes at the end of a sentence? (personal communication, June 11, 2015)

The lesson then focused on the writing process rather than log in and how to. Partners worked together and individually edited work as students progressed through the list of apps. Students brought their booklets to Ms. A and Ms. A traveled throughout the class.

Student peer support for lessons in all three classes. In all three classrooms students provided peer tutoring and support. The students demonstrated that they understood the directions by discussing and helping each other first, rather than seeking out teacher support.

Teacher lesson feedback in all three classes. All three teachers provided immediate and individualized lesson feedback. Students raised their hands to ask for a check of their booklets and assignments or brought them to the teachers as they completed them. For example, as Ms. A checked them she drew their attention to grammar and punctuation and requested that students edit their work. She referred to the projected sample on the Smart board several times reminding them to fill it in completely. She also referred students to the *Quick Word Handbook for Everyday Writers* that students had taken out and were using the spelling words for editing their final products.

Four students lined up to have their booklets checked with Ms. A for completion. Ms. A sent the students who were finished to her desk where she stamped their work with a wooden stamp she used to print “Outstanding” on the back of the book. The rest of the

class was finishing up. Ms. A was working with a boy at his seat. She pointed to places where he needed to find edits. She counted the pages with him to make sure he completed them all and asked him to read what he had written out loud.

As fifth grade students finished their paper station products they either put them in their SLAM notebooks or turned them in to Ms. T as she was walking around the room checking them off.

Device management at the close of the lessons in all three classes. Students in all three classes cleaned up their tables then returned their BYOD to their backpacks and school devices to the racks, bookshelf or cupboard very neatly and quietly without any other direction. This is obviously a procedural routine and students were trained to respond this way without incident.

Data Analysis of Interview Questions

There were commonalities in terms and responses to the research study questions across all grade levels and these were identified as themes and nodes including; BYOD support and training, classroom organization, device management, communicating BYOD with families, integrating BYOD into the curriculum and CCSS, equity, preventing inappropriate use, cyber bullying and accessing inappropriate content, character education, school and classroom rules and disciplinary actions, teacher perceptions regarding BYOD and advice for other educators on BYOD. The discussion of interview data from teachers and administrators is separated into two separate sections as the questions asked and data collected were different although they shared the same terminology and language as reflected in the word count tables that combined their

responses. The teachers and administrators responded to different questions depending upon their roles. One area to note is that some participants actually answered the questions before they were asked so when the data was compiled I rearranged the answers under the appropriate headings so they could be compared and contrasted in relation to the corresponding questions. In that sense NVivo was not helpful, as this task required the researcher to determine where the answer should be transcribed and entered. If left in its original location the software would not have picked up its relevance and weight. So the use of technology to analyze this data is only as good as the judgment and interpretation of this researcher. I made every effort to accurately capture the essence of what my participants were attempting to convey in relation to the corresponding questions and not just copying verbatim answers to questions and then using technology to perform a word analysis.

The following section presents the research data analyzed according to the teacher interview questions which were also developed into themes.

Interview Question 1. Describe your teaching assignment and students.

Table 9 presents data on each teacher participant including the grade taught and number of students in each class.

Table 9

Teaching Assignment and Number of Students

Teacher	Grade	Number of Students
Ms. S	1	23
Ms. A	2	25
Ms. T	5	33

All three educators were asked to describe their teaching assignment and students. The responses revealed that there were three grades represented; one, two and five. There were 23 students in the first grade class, 25 students in the second grade class and 33 students in the fifth grade class. A total of 81 students were served by these teachers. The first grade teacher reported,

> I have 23 students; two students are ELL (English Language Learner) students. I have a couple of children with learning disabilities. I have one soon to be identified as a challenge student and for the most part just a whole bunch of sweet, wonderful children. (personal communication, May 20, 2015)

Interview Question 2. Describe the training and support you have received on BYOD.

In Table 10, teachers reported on the BYOD formal training they received.

Table 10

Training Received on BYOD

Teacher	Grade	BYOD Training Y or N
Ms. S	1	N
Ms. A	2	N
Ms. T	5	N

Although none of the teachers participating in this study reported school or district training specific to BYOD, extensive technology training in the form of training on specific devices including the iPad and applications was reported. Ms. S the first grade teacher stated," Actually no training on BYOD. Our district is pretty good about providing trainings for devices, but it's typically for either a software program, an online

program or a specific device" (personal communication, May 20, 2015). Support for BYOD was reported at the school and district levels. All of the teachers reported that the BYOD technique was an accepted and supported practice. Teachers and the principal referred directly to the existing behavior management system, Love and Logic as instrumental in facilitating BYOD.

Although none of the teachers reported receiving specific school or district training on BYOD, it was reported students and teachers throughout the elementary school were trained and accustomed to following the school-wide program based upon positive behavior management and classroom discipline called, Love and Logic developed by Foster W. Kline M.D. and Jim Fay, who also co-founded the Love and Logic Institute. The fifth grade teacher explained, the impact of this behavior management system already in place,

> I was just brand new to the idea but coming over to Sierra Elementary, they (the teachers and principal) had a whole system in place, and expectations and the students knew how to treat devices, they knew if they were inappropriate with the device once, then it was gone for the rest of the year. All of those structures were in place so I basically just walked in and implemented it. This elementary school already created the culture with how to handle their devices and there's a link on their website that tells you the protocols and parents are involved and they just made it a school-wide deal. So it was very easy for me to transition into the BYOD. (personal communication, June 5, 2015)

All three teachers referred to Love and Logic multiple times in their interviews indicating its relevance to BYOD implementation in their classrooms. Table 11 presents the frequency each of the teacher participants references to Love and Logic during their interviews.

Table 11

Teacher Interview References to Love and Logic

Teacher	Grade	# Love & Logic References
Ms. S	1	7
Ms. A	2	3
Ms. T	5	5

For over 35 years the Love and Logic Institute has been recognized as a leader in the area of helping parents, educators and counselors to teach children self-regulating and self-discipline. Love and Logic is the technique employed by educators at this elementary school to teach and reinforce appropriate student behaviors required for the BYOD policy at their site. BYOD is built into this already existing behavior and classroom management system that incorporates the techniques and philosophy of Love and Logic school-wide across all grade levels.

The second grade teacher Ms. A reported a high level of support for BYOD, stating,

> I wouldn't say we have had any training specific to BYOD other than what the policies are, that are handed to you. The support however, in this particular building, is really high and it is really wide open. The kids can bring their devices and use them for academic purposes whenever needed. (personal communication, June 11, 2015)

All three teachers reported no formal training on BYOD either at the district or school site levels. BYOD is not considered a separate topic or tool as explained by all three teachers. BYOD fits in with the school Love and Logic program policy of allowing students to bring items from home as long as they do not cause a problem. Students must follow the basic technology use rules, to not leave the device on the floor, not use during recess, and keep away from water bottles and to not access inappropriate sites or content irrelevant to the lesson or cause a problem for other students and staff.

Teacher reported support for BYOD. All three teachers reported that the support for BYOD in this particular school was high as evidenced when Ms. A said, "The support however, in this particular building, is really high and it is really wide open. The kids can bring their devices and use them for academic purposes whenever needed" (personal communication, June 11, 2015).

Teacher reported support and training on technology. As Ms. S shared although she has not received specific BYOD training, the Whitfield District has extensive training available for teachers on technology,

> Our district is pretty good about providing trainings for devices, but it's typically for either a software program, an online program, a specific device. For example, right now you can get iPad training. So you can get various trainings but not necessarily anything where you just go and they talk about BYOD management. (personal communication, May 20, 2015)

Teacher reported support and training needed on BYOD. Ms. S expressed a need for training on BYOD. She shared the thought that the district should not only

provide formal training but opportunities for experienced staff to share practices when she stated,

> BYOD management actually would be a really good idea, because especially if they (the district) are going to move in that direction. I think we learned that there is a lot of pieces to it that would be helpful, and if people are sharing their management ideas and their strategies that would probably be really helpful. (personal communication, May 20, 2015)

Teacher reported self- study on BYOD. This report of self-study highlights the need for professional development opportunities and the way one teacher coped with the lack of formal opportunities. One teacher, Ms. S, reported although she had no formal training on BYOD she did study the topic on her own stating, "I have read lots of blogs about people who have brought a device for a day or done some kind of small little pieces and projects where they have had kids do it" (personal communication, May 20, 2015). This report of self-study highlights the lack of formal professional development opportunities at this school and district on BYOD and that teachers utilize the district web-site and other self-selected web resources to learn about BYOD.

BYOD training based on BYOD policy. Ms. A shared that although she did not have any formal BYOD training, her school administrator did provide the policies in place that facilitate it. She shared,

> I wouldn't say we have had any training specific to BYOD other than on what the policies are, that are handed to you. The policy is that students have to be working on directed academic things when they are using their devices in the classroom

> and they may not use them around the building at other times. They can use them before and after school, say on a bus ride but no other times during the day, unless specifically directed by the teacher. (personal communication, June 11, 2015)

Interview Question 3. Describe your experience implementing BYOD.

In addition to the observed lessons specifically designed by all three teachers to incorporate BYOD as a tool Ms. S reported this experience,

> They (first grade students) did a little bit of experimentation. So right after you left, our butterflies started emerging so all the kids grabbed their devices and ran over and they were all filming and recording and doing all this fun stuff. It was pretty sweet. (personal communication, May 20, 2015).

They were then empowered to create a spur of the moment school to home connection as they could then share these videos of a fleeting magical moment with their parents. But Ms. S also shared that she had them put their devices away after a few minutes so students without devices and students with devices could attend to and share the moment as a class.

Interview Question 4: How do you organize your classroom to facilitate BYOD?

A small group science, language arts, mathematics centers rotational model was used in the first and fifth grades. Ms. S shared**,**

> We (first grade classroom) typically do most of our technology type work in small groups where they (first grade students) rotate through. So they had five different centers and they go to each color. I have six tables, so two tables in each group. So 1/3 of the class is working from the purple tub, 1/3 of the class is working

> from the blue tub and another 1/3 is working from the green tub. One of those tubs is a technology piece. One of those tubs is a kinesthetic piece where it's more hands on, movement, sometimes its play dough, sometimes its Wicki sticks or some kind of kinesthetic. So each day they do one of those three activities. When they are finished with that activity they have another activity that they move to. So I don't actually stop instruction. But this time there are six buckets so each table has something different. So one table, when they are finished with their activity they would move into what we call their bucket work. Bucket work would be reading into an iPod to practice their fluency and listen to it. Another group might be reading myON on one of iPad minis, so each bucket has something different. It feels pretty organic because they come in and they self-start, they move, they go to one thing, then they know to go to the next thing. They choose and for the most part it just operates. During that time, what I typically do is go around and I work with my struggling readers. I work with my struggling writers. I get some one on one time around the room. I don't have to pull a group. I just go to them. They just stop what they are working on and work with me for a little bit, then I move to the next child. It works well. (personal communication, May 20, 2015)

Interview Question 5: How do you physically manage BYOD?

Physical management of BYOD. In all three classes the physical management of BYOD has been turned over to the students themselves who have had lessons modeling the expected behaviors and procedures beginning at the start of the school year.

Teaching device procedures. Second grade teacher Ms. A. teaches procedures.

> There are more procedures than rules. When we get in line it looks like this. When we use a device it looks like this. Our technology project does have some lessons about how to handle devices. Carry it with two hands, use it at a table instead of on the floor, so there are those procedures in place. (personal communication, June 11, 2015)

Ms. S, first grade teacher, has taught device management to the students from the beginning of the school year as part of her lessons on procedures as she describes here,

> At the beginning of the year, before we even pull out any kind of equipment, we go through lessons on how to manage the devices, how to manage what the expectations are, where they should be, where they shouldn't be. There's no equipment while we go through all of these things. We have lessons where we practice, lots of modeling. Once I decided to turn over the equipment to them I decided that it was too much for me and they needed to manage it. What does that look like? Training and then practice. Now show me. By the upper grades, we have pretty much the same expectations through the entire school. (personal communication, May 20, 2015)

All three teachers allow students to store their BYOD in backpacks and retrieve them as needed to place on their desks. All three have designated spots in their room for school devices and charging stations that students are free to use set up on carts, shelves, racks and cupboards. Ms. S described her charging procedures,

> We (first grade classroom) have a couple of areas around the room where they can charge them if they need to. So some of the kids bring their chargers and they charge them. So they have got a couple of spots over there where they can charge. They could always access this; these are…I am pointing to the cart. There's a cart with charging stations with iPods and iPads and devices all plugged in so they can plug in their own devices there. (personal communication, May 20, 2015)

Fifth grade teacher Ms. T described her device management system which includes a specific technology area in her classroom,

> I have a whole tech area, like a tech corner with a charging station for everything, so everything goes back to where it was. So keeping that a one stop shop with the mice, headphones, rockers, iPad holders, brackets, everything was just in one corner of the room. That's kind of how I did everything in the room. I have my library in one spot. I have community supplies in one spot, so they knew it wasn't just random around the room and there was a go to spot for things. (personal communication, June 5, 2015)

In all three classes students are free to use their own devices then return them to their backpacks. The fifth grade teacher explained her gradual release model. Ms. T shared this progression of increased responsibility,

> You know at the beginning of the year they (BYODs) were kept in their (fifth grade students) backpacks and then I would ask them to go get it at certain times and then have them put it back. That is where I started, kind of strict that way. Then towards the middle of the year they would have it in their pockets, they

> would have it in their pencil boxes, coats, sweater pockets. (personal communication, June 5, 2015)

The first grade teacher Ms. S explained her BYOD procedures which permit students to keep their devices in their backpacks or on the tables in the classroom ready for use,

> When the kids (first grade students) are not using them, if they know they are not going to use them for a while we have them keep them in their backpacks. If there is a device in them (backpacks) we hang them on the hooks so they are not on the floor. If there is a possibility that they are going to be interacting with it throughout the day, for example during centers they're not going to need them because we are going to have water and different materials out for painting and things so we have to be really protective of the devices, they can keep them on the table or they can keep them in their home, that is what we call their backpack, because they go back and forth to school each day. (personal communication, June 5, 2015)

Interview Question 6: How do you communicate with parents regarding BYOD?

Communication regarding BYOD. There are several ways in which parents receive communication from the teachers and the school regarding technology in general and BYOD in particular. Teachers are required by the principal to communicate with parents via a class website and an electronic newsletter and they report communicating regarding Love and Logic and BYOD as necessary through their newsletters. The school has a webpage dedicated to technology policy and practice as reported by fifth grade

teacher Ms. T, "There's a link on their website that tells you the protocols and parents are involved and they just made it a school-wide deal. So it was very easy for me to transition into BYOD." Teachers report that they incorporate information regarding Love and Logic, the foundation of BYOD, at their Back to School events. The first grade teacher also suggests that in the future she will request that parents bring their device with them to Back to School night and that she can then assist them in loading apps and bookmarking sites to be used at school and home.

Communication via e-mail newsletter. Ms. A informs parents through a newsletter,

> I sent it (BYOD) in the newsletter a couple of different times and talked to the kids (second grade students) about it and asked them to talk it over with their parents. I just made it very clear that it was optional and I did have feedback from parents that they were concerned about sending a device to school with an eight-year-old. So it was just completely optional and they felt fine either way. (personal communication, June 11, 2015)

Communication via parent back to school night. Ms. A reported that she uses Back to School Night to communicate, "At parent night I always give them an understanding of what Love and Logic is about, that it is for kids to be responsible for their own behavior" (personal communication, June 11, 2015).

Communication via school policy. Ms. T shared the importance of School Policy that all teachers are on the same page as she explained,

> We have a technology policy at the school and I (fifth grade teacher) would send

> that to them (parents) and I let them know my stance on BYOD and that we are not responsible for loss or damage. Parents have not given us any grief about it. They know the expectations and as a school we stand on the same page. That helps when everyone is on the same page. (personal communication, June 5, 2015)

Interview Question 7: How do you integrate BYOD into the curriculum?

Integrating BYOD into the curriculum BYOD as a tool. Ms. S concurred with all three of her colleagues and both the site and district administrators when she said, "I think that like anything you use in the classroom technology is simply a tool. Is it always what is going to be the best tool to achieve your objective?" (personal communication, June 5, 2015).

All teachers reported using BYOD for individual research. Ms. A shared a historical perspective of BYOD as a tool based upon the history at her site,

> I think that's a function of time too. These kids were working with devices since kindergarten pretty handily along with the curriculum and now it's just another tool. It is like picking up a pencil. Get your glue, get your scissors, get your device, and get your book, which is the way I think it should be. I think that takes a little bit of time, before the technology was the thing instead of the learning. (personal communication, June 11, 2015)

Fifth grade teacher, Ms. T asserted, "It is just a tool for all curriculum. It isn't tied to curriculum, it is just another resource" (personal communication, June 5, 2015).

These teachers are past the learning curve of device usage and are now viewing it as a tool to be added to their tool kits.

Interview Question 8: How do you use the BYOD policy to facilitate the CCSS?

All three teachers reported and demonstrated using technology in general and BYOD during lessons aligned to the CCSS. All three teachers refer to BYOD as a "tool" to facilitate instruction not as a topic in and of itself. Ms. A explained it this way, "It's like any other teaching tool, and it's how you direct the instruction with it. So it fits in terrifically if you can help them (students) expand on what they have learned, show what they have learned and conduct their research" (personal communication, June 11, 2015).

Ms. S explained the procedure for incorporating technology including BYOD into lessons according to the CCSS,

> We have our Common Core State Standards, and we put those into our instructional calendar. So we pace depending upon what we are working on. The district tells us when they want us to report out on certain topics. So we know in the first trimester we need to do Place Value, Addition and Subtraction. We know in the third trimester we need to report out on Geometry. So when you are looking at your Common Core Standards and you are trying to decide how am I going to meet that objective? Is an iPad going to be the best device, or writing words in ABC order where they can physically manipulate and see, would that be the best goal? So I think it really is just looking at what your target is and then choosing the tool that is going to best meet that target. I don't know that it (BYOD) is any different. I really don't know that it would be any different, you are still looking

> at your Common Core and you are still choosing what the best way to meet that. So whether it be technology, or not technology, you are still looking for the best tool. (personal communication, May 20, 2015)

The CCSS college and career readiness standards require students to access various Internet resources and Ms. T discusses incorporating BYOD to accomplish the CCSS in her comment, "With the Common Core it (BYOD) touches on being able to use a variety of resources. There's the whole technology standards, for them to be able to navigate technology and do research, find information" (personal communication, June 5, 2015).

Interview Question 9: How do you provide equity for students without devices when implementing the BYOD policy?

Closing the equity gap with BYOD. The teachers all reported that BYOD enabled them to provide 1-1 ratio of devices in their classrooms although it was commented and observed during lessons that when used in a centers rotation or partner model, 1-1 is not absolutely necessary. Even though teachers have devices available, some devices available at the earlier grade levels are not as up to date and do not get all of the apps teachers want to use. Ms. A elaborated on why she found BYOD instrumental in providing a 1-2 ratio of technology to students. Ms. A shared,

> Well we (second grade classroom) have nineteen devices if you include the laptops. They are in the classroom. I have quite a lot of devices. Some are older iPods that don't necessarily get all of the apps that we want to be using. The same with some of the iPads. We really have nine devices that are real portable and up

> to date as far as a tablet goes. That (BYOD) was really helpful because I had enough devices to partner everybody up and I only had about six kids throughout that brought their devices on and off, but that is enough then to do a good amount of partner work on the devices and let them really focus in on what's really happening with the device. It was enough in combination with what I already had available. (personal communication, June 11, 2015)

In schools where technology is available, student BYOD models may help by providing more powerful devices with capabilities matching and or exceeding those of the school devices and decrease the student to device ratio.

In this elementary school a historic and concerted effort has been made by the principal to provide every class with equitable access to technology. They have successfully pursued pilot funding, grants and community booster support in order to become early adopters of technology. This year computers were upgraded throughout the school and every class has a variety of devices including sets of laptops. According to Fifth grade teacher, Ms T, student access to school provided devices varies from the early to older grade levels. Ms. T reported,

> Last year I had half the amount of the devices as I have this year. This year I have fifteen mobile devices and then five laptops so twenty technically in my classroom of 33 students and it's been nice to fill the gap for kids who don't have their own device and I want to do a whole class situation where I need them all to be on a device. (personal communication, June 5, 2015)

BYOD helps her to fill the gap between the available technology on site and the need.

Blending school devices and BYOD to facilitate equity. Ms. S shared her thoughts regarding the importance of equity,

> That's equity right there. (Pointing to the cart of school devices). They walk over grab what they need and it's there. They have an iPad they can get, an iPad mini they can get or iPod there that has everything on it that they need. So I feel like if you are going to have kids bringing their own devices, you have to have a resource available to them here. (personal communication, May 20, 2015)

Sharing devices. Ms. A emphasizes the importance of sharing all devices amongst students in her classroom,

> We're just fortunate because we (second grade students) have so many (devices) already. It didn't matter. We made it very clear (to students and families) that it did not matter whether you brought one or didn't bring one, we would just be sharing. They (students) were just focused on the project at hand. (personal communication, June 11, 2015)

Interview Question 10: How do you prevent inappropriate use, cyberbullying and accessing inappropriate content while using BYOD?

Digital citizenship class. This elementary school also has a computer lab and computer teacher so students receive formal digital citizenship training and lessons in their classrooms. Ms. S elaborated on digital citizenship,

> In terms of cyber bullying, and those kinds of things, they go to computer class

> once a week. The computer teacher talks about digital citizenship. I talk about digital citizenship, but you cannot keep a child from going where they are not supposed to be. You can only tell them what your expectation is, practice your expectation and look for your expectation. (personal communication, May 20, 2015)

Ms. A relies on the guest networks filters to protect her students from inappropriate content at the same time monitoring her class continually,

> There is a little layer of protection built right in by the district because they have to sign into the guest network that is restricted so as far as inappropriate video materials and that kind of thing there is a layer of protection there, but then I just closely monitor the class all the time. (personal communication, June 11, 2015)

The social network permitted at this school is Edmodo and this secure site allows teachers to monitor and control all student interactions even deleting posts or blocking users.

Social media management and Edmodo contract. Ms. T shared the social media resources she allows her students to use and an instance of inappropriate use she encountered in her class. She and outlined her Social Media Contract that all students must sign in fifth grade,

> The only social media that we use in the classroom is Edmodo and Kid Blog. Last year I had inappropriate use. We reviewed the expectations first and we signed an Edmodo contract and agreed to no text language. I have them send them home to their parents. Last year they loved Edmodo! They would connect, talk, and it had

> to be school related and some of them started socializing on it and I shut it down. I literally had three kids crying because I shut down Edmodo. I said, 'It is a one stop, you guys knew the expectations'. I had deleted some text lingoes and I had to show them how I could delete their messages. This year I explained what happened last year and there were no problems, word got around so this year was pretty easy. (personal communication, June 5, 2015)

Interview Question 11: What character education, school and classroom rules and or disciplinary actions are in place to facilitate BYOD?

All three teachers report that Love and Logic is the behavior management and citizenship program used across all grade levels. Love and Logic and its natural consequences and problem solving techniques are proactively and uniformly taught and used to manage behavior across situations in class and out. The Love and Logic tenants apply to all property brought to school by individual students and dictate how students are to care for school property. All teachers, parents and students understand that any object, toy or device brought to school is the responsibility of the owner and all students are taught to take care of their own property and respect others property. Teachers do not take responsibility for personal items or BYOD and parents understand this is a school policy. Fifth grade teacher Ms. T explained,

> They (the school) had a whole system in place, and expectations and they (the students) knew how to treat devices, they (the students) new that if they were inappropriate with the device once then it was gone for the rest of the year. All of those structures were in place so I basically just walked in and implemented it.

> The school already created the culture with how to handle their devices. (personal communication, June 11, 2015)

School wide Love and Logic natural consequences - loss of privileges. All three teachers reported that they use the Love and Logic natural consequence of loss of privileges for inappropriate use of BYOD. This loss of privileges increases in severity from a day to permanent loss depending upon grade level with the more severe consequences instituted at the upper grade level. There was only one instance a year ago of a permanent loss of privileges at the fifth grade level.

Love and Logic loss of BYOD privileges for a day. Ms. S shared a first grade vignette from her classroom that illustrates Love and Logic,

> It's like the little girl, (she is referring to the little girl who videoed the butterflies and then wanted to video a Discovery video) in first grade that little girl is innocent. They are not trying to steal someone's copyright movie but there's a quick consequence that, Uh the device goes away, put the device away! So they know if they venture, this little guy over here (Pointing to a desk) he had his device down here (Pointing under the desk) and he had turned on one of the games that he plays at home. So we talked about what do we use at school? What do we use at home? We have two different reasons. Why we are using devices at school. You may or may not have those same reasons at home. That was a violation of the device, so put it away and we will try again tomorrow. Once it gets put away it's gone for the day. But they can try again tomorrow, no worries,

> no problem. I am sure you will fix it. (personal communication, May 20, 2015)

Ms. S has a "toy" box for those devices when students use their BYOD as a toy instead of a tool.

Love and Logic loss of BYOD privileges for period of time. In second grade the loss of BYOD privileges according to her implementation of Love and Logic was reported to possibly increase to an indefinite period of time as Ms. A shared,

> I have had to, not in this particular project, but I have had kids (second grade students) where I have taken away device privileges for a certain period of time. The little things my students have done is they love photography programs and they want to take pictures of things and that is just off task behavior. Not necessarily bad it is completely experimental. I suppose it would be like in our era we would have drawn a picture when we were supposed to be doing something else, right? Now they are just taking a picture. That's what I have noticed, and we just make a pretty firm rule that you may take a picture if it is something that is a part of what we are working on. There is no set policy with any behaviors. It's always (Love and Logic), if you cause a problem we will figure out what we are going to do about it. (personal communication, June 11, 2015)

Love and Logic permanent loss of BYOD privileges. Ms. T reported that at the fifth grade level the consequence for misuse of BYOD is more stringent,

> It (storing BYOD in backpacks) got more lax once they (fifth grade students) knew I was serious about if I ever catch you misusing it or when you are supposed to be on a math app and you are playing Mine Craft or something then it's gone

and you are no longer allowed to bring it. Some kids need it for the bus and leaving and that's fine but it is in your backpack for the rest of the year. So one strike you are out policy. So they (all elementary students) can't take their devices on the playground, they know that, more for liability. They know if they break it that's their fault with Love and Logic and natural consequences. If a duty sees someone with a device, they have to go and take it back. So it's not supposed to go on the playground, not on break at all, no recess, no lunch. No that's how the devices will get crushed and we don't want to deal with the aftermath of parents being really upset about it. But in the classroom, like during indoor recess they are allowed to bring it out and play whatever they want and they are connected to the guest network so it is still limited. They can't just get on to whatever they want. No disciplinary actions this year. Last year I had one and this year I had none. They were playing a personal game and they were doing something when they were supposed to be working on the math app and I said, 'You are done, it goes in your backpack'. They were not allowed to bring out their device any more. Even at recess, nothing and they knew. They knew. They didn't even question me on it. They said, 'Dang it'. They blew it. They knew better. (personal communication, June 5, 2015)

Interview Question 12: What are your perceptions regarding BYOD implementation in your classroom?

Teacher perceptions regarding BYOD. Teachers shared various perceptions with all three reporting positive ones such as providing increased access and engaging lessons. Ms. T,

> I really enjoy it (BYOD). Kids feel really comfortable with their own devices. It is a huge resource for teachers because lot of our stuff is technology. They are engaged with technology and if I only have five iPads and I've got another 25 other kids that are bored they can't wait to get to that one activity. We'll research new apps and different tools to use and I really like it…my fifth graders they do really well with it (BYOD), so very minimal grief. (personal communication, June 5, 2015)

Interview Question 13. What are the Challenges of BYOD?

A challenge, reported by all of the teachers at the early grade levels, one and two, is that teachers must be familiar with a variety of devices because teachers of young children must act as troubleshooters, helping students to navigate and log on to the guest and district networks and sites.

The fifth grade teacher also had volunteers who trained as IT managers and there was always someone designated to do that official job. So it appears that there is a difference in the level and type of device management required at the early elementary levels but this was very well managed by these particular teachers with their individual

log in folder or each child or list of logins posted on the board as ways to assist little ones with this process.

The first grade teacher Ms. S also reported, “This is first grade, so we are talking six and seven year olds, you know, and they are pretty young. So a lot of it is the device management so, and they all want your attention at the same time”. (personal communication, May 20, 2015) Although she reported this as a challenge she was adept at modeling and teaching procedures for requesting help. During her observation her students asked their neighbors for assistance first then waited patiently with hands raised for her assistance without shouting out or getting out of their seats.

Younger students get older less powerful BYODs. Ms. S worries about the equity issue when older BYOD are given to younger children these devices have lower capabilities to access apps and the Internet,

> Probably not in fifth grade, but in first grade the disadvantage is they get all of their parents’ and big brothers’ and sisters’ leftovers. So when they’ve upgraded they give this stuff that they don’t use anymore to the little tikes. Trust me, I get it cause am I going to put a $300 to $400 device into a little one’s hands? So they get their devices, that you know in my mind aren’t that old, three to four years old but the apps don’t operate on them because it is not the right operating system. So we can’t get all the things that we need. There is no way I would ever ask a parent, ‘Could you upgrade your child’s device?’ So that’s a disadvantage because couple of kids came in with beautiful new iPads and some kids come in with their parent’s old device… I think at the older grades have newer devices, at

> least I believe it to be true that they have more of the newer devices. It just seems like they are able to talk their parents into the newer stuff. And if you were to ask the kids, that would have been a good question for you to ask them, 'Where did you get your device?' (personal communication, May 20, 2015)

Challenge of getting parents on board to participate in BYOD. Ms. A, thoughtfully shared her struggle with getting frightened parents on board with BYOD,

> I think again, at my grade level, getting people who want to participate. It's just scary for parents. I had a parent on a field trip say to me, 'Have you met my son?' (Laughing) 'I just can't see sending him with our tablet'. They don't all have their own at seven or eight years old so I think that is a challenge if you wanted to try to get more happening. (personal communication, June 11, 2015)

Achieving balance in the elementary classroom: BYOD verses hands on learning. Ms. S, expressed a concern for achieving balance in early elementary grades between technology and hands on activities when she said,

> I (first grade teacher) try not to get all the technology all at once. It's really a fine balance. You want that technology, but you want to have the balance with other things (pointing to centers) as well. You don't want one child just on an iPad all day long. (personal communication, May 20, 2015)

Student use of technology verses use of printed books. Ms. T, reported the necessity to teach students to evaluate resources and that technology is a tool, when she shared the assumption on the part of her students that technology resources were superior to books,

> I had an activity where I gave them a text book, an article and a device. They had to answer these questions and to choose whichever form of research they wanted to use. Almost all of them went to technology when the answer was in the book clear as day, third page in. Someone found it in the book and said, 'Oh my gosh, the answer is right here!' So they all grabbed the books and put down the technology and I am, See, so that means we learned that technology is not always the go to tool. Sometimes there are ways that are easier, quicker. So I kind of teach them that technology is not the save all, answer all, but yet it is very resourceful tool when it is appropriate to use. (personal communication, June 5, 2015)

Interview Question 14: What are the Advantages of BYOD?

BYOD provides access to up to date information. Ms. S appreciates the opportunity BYOD provides for students to use up to date resources,

> I think that our literature resources are 13-14-15 years old. They are still working, but where BYOD is really nice is when you can pull in myON (district adopted online reading program) which is a really great resource, or log into Discovery Education (state adopted cross curricular online digital resource). So you can update your curriculum naturally through the devices, where we can't update the district literature series. That in itself is a really nice feature. (personal communication, May 20, 2015)

Ms. T also noted the availability of new resources when her fifth grade students are using BYOD stating,

> Quick resources, fresh resources, new resources. These textbooks are what 20 years old? And the information online is fresh daily, minutes ago and actually looking up good information and not having to buy text books and going out of date. They can access data and in fifth grade we research so much. It's new and reliable. (personal communication, June 5, 2015)

BYOD provides cost savings. Ms. S cites the BYOD cost savings and staying current with resources,

> So we can do that, accessing resources online, whereas for the district to buy a whole new series for math is so expensive and it is probably outdated by the time it gets off the press and into the schools. I think probably it is the best positive thing about being able to BYODs so we can stay more current. (personal communication, May 20, 2015)

BYOD facilitates partner work. Ms. A, shared that BYOD facilitated partner work even though she has access to school devices when she said,

> I think it worked out well… especially for that partner work. I think it was nice to have more devices. Again we are in a good place with technology. We have a lot of it available so I don't feel like it has been a high need for me, but at the same time I can see how it would benefit us if we want to do a project that requires a little bit more for everybody. (personal communication, June 11, 2015)

BYOD sparks interest and ownership. Ms. A, observed increased motivation in her students using BYOD as they demonstrated increased excitement and ownership of their devices,

> Well it was a pretty short stint for me, but they sure did have a lot of ownership with their own devices and were pretty excited about it, as excited about it as when we first got devices in the classrooms seven or eight years ago whenever we first got devices. It was exciting stuff to have those in the classroom. Now that is what I kind of saw. Kind of like look at when I have my own they were going, 'What kind is yours?' So it did spark a little interest and ownership. I just think there is that ownership piece, that motivator. (personal communication, June 11, 2015)

Students prefer BYOD. Fifth grade teacher Ms. T says her students actually prefer BYOD,

> Students Prefer BYOD unless they are doing research, then they like to have a bigger screen. When they are playing games or they are looking up pictures to post on Edmodo, they know how to save their photos really fast. Everyone when I say, 'Get your own device' they all grab their own devices. (personal communication, June 5, 2015)

Students become the expert on their own devices. Ms. S noticed her students' competence as they worked with expertise on their own devices,

> I think that BYOD is different than having six iPad minis. Bringing your own device, first of all, it lets you become the expert on your device because each family has something different. There is something to be said for that learning curve, it's not as steep because it is something they use with their family. So that being said, that is an advantage. (personal communication, May 20, 2015)

BYOD facilitates parent school connection. Two of the teachers noted increased school to home communication in three areas; through the use of BYOD to create Summer Applications booklets, creating videos of classroom activities and use of the same installed applications at school and home. Ms. S shared how parents of her students share in the excitement in the classroom via BYOD,

> Parents can see what their kids are doing at school. So if I have requested them to put on this app, this app and this app, then they can take it home and they can access it. And then all those kids are showing their families right now, 'Look at the butterflies we set them free today! So look watch the butterflies be free!' So they have just brought their classroom into their home! So that's huge!

Ms. A reflected on her class booklets entitled Summer Apps,

> Then the continuity from school to home which was kind of what I was building in. That writing piece that they were working on in my room, was well you can work on this here but then you are going to be able to do it at home as well. That school to home piece I think is a big advantage. (personal communication, May 20, 2015)

Interview Question 15: What advice can you give to other educators considering BYOD?

Ensure equity. Ms. S, like her colleagues and administrators, is concerned about students who do not have their own devices. "I would make sure that you had the materials that you needed, so children without devices would have access to them" (personal communication, May 20, 2015).

Establish and teach expectations. All three teachers emphasized the importance of teaching expectations. Ms. S,

> I would definitely set up expectations without any technology even in their hands. I would set up those protocols, those expectations. I'd think through that management piece. Where are they going to store? How are they going to hold? Will you allow them on the ground? Make sure you are very clear on what your expectations are so you can share those. (personal communication, May 20, 2015)

Fifth grade teacher Ms. T also recommends setting up expectations and emphasizes adhering to them without exception. According to Ms. T,

> Set very clear guidelines and expectations, very clear and hold firm to them. At the same time loosening up a little, like don't try to micromanage it, trust them. Technology isn't as exciting as it was five years ago. They all have iPhones. They all have tablets. Five years ago it was like, 'Oh my gosh there's an iPad in the room!' and they'd fight over it and want to play with it. Now it's just like a textbook in the classroom anymore. But firm guidelines, expectations, but yet breathe and let them play with it a little. Let them prove you wrong, that they are not going to handle it well but I bet they'll rise to the occasion. (personal communication, June 5, 2015)

Set up management system. Ms. T advises teachers to utilize students as the experts,

> Find a management system for your devices. So having someone to hold accountable for that. I trained them (Student IT specialists) in the beginning and

> there's two of them. So I trained the whole class pretty much, because every two weeks I pull jobs and I'll stick them up on the board. But physical management, inventory, accountability especially with that many devices. (personal communication, June 5, 2015)

Establish balance. Ms. S worries young students need a balance between hands on interactive activities and it may not be wise to over use technology,

> Really be aware of what you are swapping out. So if you are going to swap out productivity for practice. Are you going to swap out independent work for group work? Yes, be highly, highly aware of what you are trying to teach, what it is you are trying to accomplish and what it is you want your children to learn and what your target is. (personal communication, May 20, 2015)

Incorporate BYOD into back to school night. Ms. S advises having parents bring devices to Back to School Night where they can assist in getting devices logged onto the network and apps bookmarked for their children,

> I think at Back to School Night either come early or stay late and have the parents bring their devices… You should really have it a couple of time a year because there are updates that need to happen and new things that get added but least Back to School Night is brilliant because they are coming in anyway. So bring your devices, let's get these particular apps that we may find really useful. In first grade you don't have a bunch of apps. You have a handful that the kids use effectively and that you like. What are those going to look like? And then see

> if they (parents) can get those on their devices and then help them. (personal communication, May 20, 2015)

Establish a whole school BYOD policy. Ms. A advises school administrators and teachers to adopt a school-wide policy where all teachers, parents and students mutually agree on established BYOD procedures and practices,

> I was thinking that a lot of parents, a lot of schools are afraid of the liability piece, like if a kid broke their device at school or on the playground and the parents are mad and are calling to replace the iPad, "That's my kid's iPad and it was four hundred dollars!" Having a whole staff behind a policy is important. The parents sign a technology piece at the beginning of school that is on the website and has everything listed. The principal stands behind it 100% and the staff backs it up so they relay the information to parents and just say we have no liability for this. It is your choice to bring it to class and we have not had any problems with it. But I know lot of schools don't want it and are afraid of angry parents, but create a policy to stand behind and make it very clear it is a whole school policy not a single teacher. (personal communication, June 11, 2015)

Introduce parents to Love and Logic at back to school night. Ms. S emphasizes the importance of informing parents about Love and Logic,

> Every teacher is different depending upon how they present their Back to School Information. It (Love and Logic) usually ties into your expectations for your class, what's going on for the year. It's at that point that you discuss it. (personal communication, May 20, 2015)

Start out with how to use the tools and an easy task. Ms. A believes it is important to begin with teaching young students easy tasks, like logging onto the guest network rather than tackling a lengthy research writing project,

> I think I started with a pretty easy task for the kids to work on, because I wasn't sure how I was going to be able to make sure all the kids could get on the Internet. They are not completely independent with their own devices sometimes anyway. I wasn't as concerned with the final product as the process of let's learn what this bring your own device is. Starting that way. Originally I wanted to start with the big research project we are doing but I can't imagine how that would have worked on top of figuring out how to use the tool. So, you know if you want to get to that level you are going to have to start much earlier in your school year. Or if you are in an early grade you are just doing those simple activities so that in the later grades the kids are prepared to use their devices as a good tool. (personal communication, June 11, 2015)

Obtain permission from parents to video. Ms. S reminds teachers and schools to obtain permission to video prior to BYOD implementation,

> And then they (first grade students) are like, 'Hey, I hadn't thought about recording!' So then they wanted to film their friends and then we had to go through, well we don't have permission from their parents to do that. So that kind of spontaneous, hey I found a different application for it (video), but is it appropriate at school? Is it something that needs to go home? So having those

> conversations, that got to be kind of tricky. (personal communication, May 20, 2015)

Love and Logic students take responsibility for their behavior. Allow students to take responsibility for their own behavior states Ms. A, "So the epiphany for me, when we started Love and Logic was I don't have to get upset about their behavior. It's not my behavior! It's their behavior. They manage it. They take responsibility for it!" (personal communication, June 11, 2015).

Just try it! Ms. A summed up teachers and administrator attitudes with this advice,

> I would say just try it! It was delightful. It was scary, but like a lot of other things you just have to try and if it doesn't work you have learned something either way. So why not give it a try? That's what I would say. (personal communication, June 11, 2015)

Administrator Interview Data

Two administrators were interviewed for this study, the principal of the northwest suburban elementary school Ms. B and the district superintendent Dr. D. I prepared them for the interview by submitting the questions preapproved by Walden University's IRB, in advance via e-mail. I encouraged them to review and add any additional questions they thought might be pertinent to the study of BYOD. I made appointments with both of them, at their convenience, after the school year had come to a close due to their extremely busy schedules. The interviews were held at each of their offices. When the interviews began I engaged in small talk to create a relaxed environment and since I

already knew both administrators in my former status as digital learning coordinator at the state department of education the atmosphere was cordial and relaxed. I informed them that I would be recording the interviews digitally and that these digital recordings would be transcribed by me verbatim into a Microsoft Word document. I told them I would send them a copy via e-mail of the transcribed interview for their approval and member checking and that they were free to redact or correct any statements and add more information as they saw fit. We then began the interviews.

The administrators received copies of these interview transcriptions but did not alter them in any way. The administrator interview data was then entered into NVivo where it was combined with the interview data from the teacher interviews to query for word frequency counts. This administrator interview data along was also hand coded for emerging themes and categorized for presentation in this section. The administrator interview data is presented separate from the teacher data due to the unique perspectives that administrators shared on BYOD in their district and specifically at this site. Where commonalities exist they are pointed out.

Superintendent Dr. D interview.

Superintendent Dr. D background and experience. Dr. D shared his background and experience,

> I just completed more than 40 years as an educator, started as a classroom teacher in Boise and was an intern principal there, came to Whitfield, in the Fall of 1978 to open a new elementary school and stayed there as principal for 15

> years. Then I spent 10 years as a director for the district, overseeing everything on the academic side of the house, Special Ed., Professional Development, Assessment, Curriculum and I just completed more than 10 years as Superintendent! (personal communication, July 20, 2015)

District description and demographics. Dr. D described his district and its demographics,

> Demographically we have very little diversity in terms of our ethnic and racial makeup….and although we don't have as much diversity in the areas I mentioned, we do now have more than seventy languages spoken here. Second Stop Refugee Center brought in a lot of refugees particularly Eastern Europeans and now African folks. Many of the kids have never been in school, they've spent their lives in camps and such. We have … schools that are spread out over almost…square miles. We serve … municipalities and the unincorporated Whitfield County. (personal communication, July 20, 2015)

BYOD timeline of events and activities. Dr. D reported the district has long been a leader in the area of technology and that BYOD was a natural extension,

> We have really been leaders in the use of technology in education since its advent. When I was the principal, as I mentioned, we had one of the first computer labs in the region. It was a radio shack color computer lab and that tells you how long ago that was. Around the corner at Summer Wind, about the same time, had Commodore 64s. So that really dates us as early users. The district standardized its technology use around IBM computers, and HP printers and

> implemented computers in every classroom at the elementary level and computer labs across the district. We were the first large district in the country to do computerized testing. We started the transition to digital devices, really led by our teachers, we watched that, monitored it, we have supported it and given grants to support it and done those kinds of things. It became apparent that we needed to really up the ante in terms of speeding up money for those devices and supporting teachers in grants. As that was occurring we realized in some sections of our district we had kids who had devices, a lot of kids who had devices, so some schools began dabbling in Bring Your Own Devices. (personal communication, July 20, 2015)

Development of the district AUP. Dr. D shared the district AUP process developed by a committee with representatives from the district and community,

> At that point about 2 years ago we made the decision that we really needed to have a district policy now available on our website. We now have several schools that use it quite a bit. I think we have had a policy in place for a couple of years. It was developed by a committee. We brought in principals, district office folks and some teachers to develop it. We started to develop a guest network and then of course, the state brought in the broadband into all the high schools and that allowed us to actually beef up our guest network. So we have a guest network available in every school and students sign in on that. Because the biggest issue that school districts have with a BYOD policy is how to manage that against their protected network. So once we had the ability to have a guest network it was not

> an issue. It is a separate stand-alone guest network. We really have not had any difficulties with the guest network. That is not the one people try to hack into. (Laughter) (personal communication, July 20, 2015)

District BYOD policy communication. Dr. D reported on his district's communication process,

> I don't think we have probably done a very good job of communicating that, it's just in place to support the schools that choose to do it and we have pretty much left it up to our individual schools to make the determination, and to individual teachers to make that determination if they want to do it. We really have not made a big deal out of it. It is just part of all the different ways that we bring technology into the classroom. It emanated from the schools, the need and that's how the use is. Sierra Elementary was probably our first school that did it. As I met with individual principals this spring, Emery High School and Emery Middle School which are in the same general area. Then I believe pretty much the rest of it is individual teachers making that decision. I think a teacher has to be willing to do that and so that is where we left it. We just made sure we have the framework in place, the expectations were clear and common and everyone was protected and it is understood, kind of the ground rules. Then we left it up to local decision. (personal communication, July 20, 2015)

Building a technology infrastructure that facilitates BYOD. Dr. D drew attention to the critical factors the district considered when developing the infrastructure for BYOD,

It's (The technology infrastructure) managed centrally through our IT (Information Technology) Department housed in the district service center. We have worked to increase the number of access points. We have a very robust trunk line out of the district office and into and out of all of our schools. So we have plenty of broadband support. The issue of course is the access point. We have had a number of pilots, and we have a number of projects going on now in terms of content. Of course the first one, as you are well aware, was Discovery and when you have streaming in the classrooms that really increases the kind of access you need. On top of that now we have adopted the Discovery Tech Book in social studies in sixth grade and we are piloting it in math and science. We also have it in our Global Perspectives classes. When you have a streamed content provider, what you learn very quickly is that you need more access. So we've beefed it up in all of our schools. We started with those middle schools because we had that sixth grade and we have just gone in as classrooms have become pilots or as we have added more, we have just continued to beef it up. We still have more work to do because our vision is quality content for every kid in every subject. That'll be the next challenge. It has been paid for from our plant facility levy, where we have about 2 million dollars a year that goes from that plant levy to support technology and particularly our infrastructure. We have also used some E-Rate money and we have also used some state technology money where that has been allowable. I see that as a major issue for school districts, making sure that the access is adequate so there isn't any hang up in the access that kids have for these

> rich streaming kinds of content. That'll be a challenge for every school district, I think. (personal communication, July 20, 2015)

Educator support, training and information on BYOD and AUP via Teacher tool kit. Dr. D explained his district's 24/7 professional development available online, "We have a very robust website called the Teacher Tool Kit that is accessible 24/7 to our teachers that runs off of our main website" (personal communication, July 20, 2015).

***Technology training*.** Dr. D described his live professional development opportunities, "We also do lots and lots of training both in terms of folks who go into the classroom, workshops, our annual technology fair, quarterly showcase events and Bring Your Own Device is a theme in those

Families BYOD and AUP information on BYOD. Dr. D shared that schools are empowered to share the AUP on BYOD independent from the district, "That is left to the schools" (personal communication, July 20, 2015). The district has also published its official AUP on the district website which is accessible to staff and the public. See Appendix G.

BYOD Challenges.

Equity concern. Dr. D stated a concern over equity,

> The biggest challenge is making sure there are adequate devices in the classroom for kids who don't have them, and having a system for that. American education has to be focused on making sure that we don't increase the divide of haves and have nots as we embrace technology, making sure that all kids have access. I

> think districts are faced with decisions about how all kids have access at home. The president talked a lot about broadband access for everybody. Most of our families have some kind of access. It is interesting, a lot of it is through smartphone and that's the device that they may have at their homes. I think that is a big issue just making sure a BYOD system is not discriminatory or isn't increasing that challenge for kids who do not have access. When it (BYOD) first started and the very first time when I said to teachers and principals at a tech fair, "Take the cell phones out of the kids pockets and use them!" and there was a gasp that went up. I remember one of our Biology teachers over at Meridian High, he was really one of the first to do that. That is really the earliest form of Bring Your Own Device. He did a really great job with sharing, it was all group work. It didn't matter if you had one or not because you had access to one. Our teachers have just handled that. (personal communication, July 20, 2015)

BYOD Advantages.

Increased speed of technology implementation. Dr. D cited a primary advantage in the capacity for BYOD to increase the speed of technology implementation,

> The advantage of course is that you can bring more technology into the classroom faster. In a big system is it hard. If you are in a smaller system, if you are having a one to one initiative putting a lot of devices in may be in some ways easier. In a big system that is more challenging. As teachers are ready they can make that decision. But it would not work in every school equally. That would be the other side of it. There are places, I mentioned some of them, where that is

> pretty easy for them to do. There are other schools that are high poverty schools where that would be more challenging. (personal communication, July 20, 2015)

Advice for District Administrators and Superintendents Considering BYOD.

Consider BYOD as a viable option. Dr. D advises other superintendents and principals to consider BYOD, "I think the first thing I would say is look at it like a viable option, really look into it. Don't just dismiss it out of hand as something you don't want to deal with" (personal communication, July 20, 2015).

Establish a robust guest network. Dr. D reported on the district solution for major network security concerns,

> I think having a guest network is absolutely vital to make it work to protect the network. Those are the biggest concerns that come from the IT folks that you can't put all these different devices on your network and have confidence that the network will always continue to work. I think that's a provision you have to be willing to make. I would just encourage folks to take a look at it for its value. Its pluses way outweighs its minuses. Just know going in you have to make some provisions in classrooms for everybody to have devices. (personal communication, July 20, 2015)

BYOD puts tools into the hands of students and teachers. Dr. D reports that BYOD puts technology into the hands of students and teachers,

> I think Bring Your Own Device is an intermediate measure as we strive to put more tools into the hands of kids and teachers. We have worked really hard to define and roll out a rotational model at the elementary school. We have two big

> pilots coming on one-to-one at secondary. I really think our approach at some point needs to be one-to-one at least at the secondary level. But it is a matter of having resources to put into the hands of teachers and students and then having a system of having a rotational way to upgrade them. We had that with our computer labs. We had that with our classroom computers so it is a matter of shifting to that. I see BYOD as an intermediate step to get as much technology in the classroom as we can. (personal communication, July 20, 2015)

Principal B Interview.

Background and Experience. Principal B shared her background and experiences,

> I have been in education for 27 years. I started as a primary teacher in Kindergarten and first grade in the Whitfield School District at that time. Then I have been the principal at Sierra Elementary for 17 years in Whitfield now. So I have been in the district now for 27 years going on my 28th year now. (personal communication, June 22, 2015)

School Description and Student Demographics. Principal B described her school and its demographics,

> Our school has changed quite a bit over the past several years. Currently I have a little over 500 students. They range right around that 40% poverty free and reduced. That is my ratio there. I have 19 classroom teachers. I have a special education program also an extended special education. I have a part time counselor. In the community of Sierra, we are the only elementary school but our

> kids are shared with a charter called North Sierra Charter School and then in Whitfield there is Gallaudet, Falcon Arts, Seven Oaks and myself are all the sister schools. ELL this last year has grown. It's gone up and down with the population. When I first started we had a significant number of ELL students then it diminished then last year I had 19 students who were categorized as ELL. (personal communication, June 22, 2015)

Timeline of BYOD events. Principal B reviews the timeline of events at her school which lead to BYOD adoption,

> Seven years ago Superintendent Dr. D took me on a trip to Tennessee. She and I went to Vanderbilt and we were on a tech conference and she knew I was interesting in using technology in the classroom and she and I were talking about that. So I went on this trip with her and it was just in the infancy stages at that point. So I came back from that and she asked what I wanted to do and at that time I was using the Apple products and my philosophy was that we are a family first of all and I did not want to have pilot classrooms. I did not want to have pilot grade levels if we were going to do something I wanted one for all and all for one! Kind of the whole three musketeers' philosophy. So we ended up starting with the fourth and fifth with iPads and before that I totally forgot my district had helped by putting in doc cameras so that would have been about 9 years ago. The boosters put in LCD projectors and doc cameras in every classroom. That was one of the commitment of the boosters, again not wanting just a few because if you kid was going to be in classroom X then they should have the same benefits if

they were in classroom Y and Z. So the boosters started that. Because of that Dr. D took me to the tech conference. I was one of the first people to start doing that on our own. So after we did that then we started with the iPads in my fourth and fifth and that rotated to the touches in my primary K3 and then it just kind of steam rolled from there getting more iPads in the primaries. With the iPads. Dr. D bought the fourth and fifth and the boosters bought the primary devices so we started with trying to figure out how we were going to roll this out. From the very beginning we were pretty structured. It's loosened up a lot. We were so specific about having certain apps on certain pages and being very specific on how it was going to be used, how the devices were going to be cleaned, how they were going to be handled all that we put into place. So it was pretty elaborate with huge management. It's relaxed over time. Teachers now manage more of it. They don't all have to be uniform they don't have to look the same. Right now I have 19 devices in each classroom so there's a mixture of five lap tops. The laptops are in every classroom. Every classroom has a mixture of iPad I, iPad II, iPad minis and iPad Touches. Which we like the mixture! Depending upon the job you pick up the tool that fits the job. It shouldn't be about the tool it should be about the job. Let's find the right tool to do your job. And I wanted them out and about where kids just grab them as needed. It's not a free time, it's not a reward, it's a working tool in the classroom and it should be used as as a working tool. We have had people come in over the years and say, you need to make them all uniform, one to one. I don't believe in one to one per say because in our classrooms we use

> stations. So sometimes you have a production station where you have laptops or sometimes you have a creation station with a device but then you still need the hands on with manipulatives like Unifix cubes and you still need a teacher station. You don't need necessarily a technical device at every station. The jobs vary and rotate. Does that make sense? It allows us to differentiate. It allows us to break instruction apart and have small group instruction. (personal communication, June 22, 2015)

AUP. Principal B on the evolution of their AUP,

> It has evolved. We started at our level and then the district came along with their level. If you have been to our district website you will see the toolbox for educators is a phenomenal thing. The district IT and curriculum staff have done an amazing job to build that. There is now a Bring Your Own Device policy which is on the website which matches very closely to what we are doing. (personal communication, June 22, 2015)

Love and Logic facilitates BYOD. Principal B reported their school's extensive use of the Love and Logic behavior management program is the foundation for their BYOD policy,

> We have been a Love and Logic building for the last 13-14 years. And several years ago before devices we said if we are really a Love and Logic building we should allow kids to bring toys to school. That was clear back with Pokémon first round. (laughter) So kids were bringing Pokémon all kinds of things for recess and different activities and our only rule was the same as Love and Logic, if it is

causing a problem for you or others then you need to fix it. We will give you strategies to fix it but you will fix it. We also told parents we will not waste instructional time to solve bad trades, find lost items. That is the responsibility of the child. And we really felt with Love and Logic kids should practice taking care of their property when the cost is low. So when they lose a Pokémon card or they trade a bad Pokémon trade or they lose their football it's not as big as maybe when they are trading their card. So hey OK take my car to the grocery store is different. So we are teaching responsibility at that level. And there's going to be some hurts with that. There were some bad trades or if somebody lost something it was their responsibility to find it but we weren't going to take class time to do that. Having that the parents really understood that philosophy well so when it came time to bring your own devices it was no different than what we had been doing all along. So the kids were bringing their devices and they were going to match the apps on our devices they wanted to play school. They wanted something similar. So a lot of the kids brought expensive phones. Even being a high poverty those were the things the families put the money into. So all our kids had devices but I think because we had the philosophy for so long we didn't run into a problem with BYODs or using them inappropriately. Kids knew it was a privilege and a responsibility so we didn't have any issue with kids having devices. I do not allow devices at recess strictly for the safety. If you have ear phones or earbuds in you can't hear somebody that might be running after a football and so it was a safety issue. Devices do not go outside but our kids ride

> the buses an hour to school and an hour home so if they want to use their device on the bus it makes total sense. But in the classroom our teachers allow the devices out. (personal communication, June 22, 2015)

BYOD family communication. Principal B requires teacher websites and electronic newsletters, "All teachers have a website. That was one of the big things we developed was the website and each teacher having their own website. Each teacher sends a weekly newsletter and that's electronic. Devices are whenever needed every day" (personal communication, June 22, 2015).

BYOD technology infrastructure. Principal B reported it takes a district-school partnership to build the infrastructure necessary for BYOD,

> The district took that partnership on. When we brought in the devices first with the iPads, Dr. D sent the tech team out here to look at our building, at our facility and at that point we figured one access point router per room so there is a router for every other room and there are routers in the halls to offset that. That has been tweaked and continues to be tweaked over time with monitoring my upload and my download speed. So we do have a district commitment. Based upon once we had devices in every room I started putting on tech tours every Thursday and that's where we started. That's been five, maybe 6 years. Based on one of those tours I received a grant from the Smart Corporation and I ended up putting in a Smart room and smartboard to use kind of as a lab. (personal communication, June 22, 2015)

BYOD and Love and Logic and Mega Skills. Principal B shares the most important aspects of their success,

> I think it has been 14 years of Love and Logic implementation. My counselor was familiar with Love and Logic. I wasn't so wanted to start training. We started with program management and a culture. When I first came here there just was not a family culture. We had to establish it. I bought a program called Mega-skills. Each classroom received the whole tutorial on Mega skills. And then the counselors, there were 11 character traits like teamwork, perseverance, empathy, responsibility and all of those character traits were there, so we picked nine out of the 11 and kind of rotated them for a year and each month they were given, say it was teamwork, they would do a weekly lesson on teamwork values and the language of teamwork. So we started with Mega-skills. And Mega-skills is still in use and there is still a monthly lesson on Mega-skills was the foundation of the culture and then Love and Logic is a way of dealing with things. I was trained as a Love and Logic trainer under Jim Fey, Charles Fey and Foster Cline, those were the writers of the book. Then we started doing the parenting classes, teaching with Love and Logic, providing the training, getting the whole building on. It's a way of operating. It is more of a working philosophy. We know how to solve the problems but the kids need to be involved. A lot of times you will have huge elaborate management plans that the teacher is managing it. The teacher has told them how to think and what to think and do it but that does not solve it for kids because when they get into the real world they need to know what to think and

how to think and what some options for how to solve it are. That's why it takes a little longer sometimes in solving a problem because we are allowing the kids to solve it. We are allowing them to make mistakes absolutely! When the tech folks come in to observe they want to know what your rules are? I don't have rules! That is the hardest part for me to explain. Just like we talked about usage, how to carry, with a handle, that's different. Yes, your hands should be clean, don't lay it on the floor, those types of things are easy to talk about but as far as a rule, the rule for Love and Logic is, if you are causing a problem for yourself or for others you will be asked to fix it. It applies to everything. We didn't set up a separate rule for devices. The counselor sends out information on Love and Logic. With the BYOD I will send out the policy now that we have a created one from district to parents, but it is mainly from teachers during their beginning of the year delivery system. Yes we allow BYODs. It falls in line with our Love and Logic. Your kids can use them but they will need to follow the school rules. They can hook onto our guest network so the filters are already in place. The kids are not allowed to go to a lot of different sites. They are not allowed to go to You Tube, Pinterest or Facebook. Those things don't go through our guest network. So they are allowed to hook on like that. We need to offer them (Love and Logic classes for families) again, it's been a while so we need to do another one. We have tried them in the evening. There wasn't a great turn out in the evening. It was hard for parents to come. The best one was during the lunch hour. So they would bring a sack lunch and we would sit and do a mini-lesson. They take eight weeks to do a

> Love and Logic series because you want to take one or two and practice those over the week. If you get overwhelmed and buried with suggestions, you won't master any of them. So one or two, practice them during the week and then come back and debrief and reflect. How did that work for you? That way you will master them and hold on to them a little longer. (personal communication, June 22, 2015)

Description of experiences with teachers. Principal B on her experiences with teachers implementing BYOD,

> In the beginning it is important for them (teachers) to know you are not going to do it alone. There was a lot of fear, I will tell you that. If you felt like you were not somebody that gravitated towards technology, there was the fear of it and the fear of what am I going to do with it. The kids are going to know more. How do I use it as a tool? Teachers are perfectionists. They don't like to fail. They want to do everything right. So I think it was very important as a school that when you do something you do it together as a team and that we are not going to leave anybody in the dirt. We are not going to leave them (teachers) behind. You are going to bring them (teachers) along and if you have common things to talk about it is a little easier to feel part of the in crowd. Back to Love and Logic you need to feel competent, valued and that you have some skills. So those are some of the Love and Logic philosophies as well. (personal communication, June 22, 2015)

BYOD Educator Support, Training and Information.

Love and logic applies to adults. Principal B uses the Love and Logic techniques with her staff,

> They (Love and Logic philosophies) apply to adults as well if you don't feel some control and how it (BYOD) is going to be used. I did have to do a little bit of forcing. So 'On Thursday we are going to use it!' because as I traveled on several trips I would see technology in the corner of a classroom just collecting dust. I am like, 'Are you kidding?' but there was that expectation that it was going to be a tool to be used. It is the same as if you roll out a new reading curriculum there are those (teachers) that always love what they had before and don't want to use the new curriculum. You have to say this is what we are using. One day a week felt good. (personal communication, June 22, 2015)

Use SAMR and "Smoosh" models. Principal B uses the SAMR model and her own technique and term for adoption of technology innovation, "Smoosh" to facilitate technology innovation amongst her staff,

> I don't know if you know the SAMR model. (Substitution, Augmentation, Modification and Redefinition), so with that I didn't want them (teachers) to feel they were living where everything was redefined. Sometimes it's a substitution, sometimes it's flashcards on the device. You kind of go back and forth. You don't just live down here where it is overwhelming, nobody does that, you go back and forth. So letting teachers know that they are going to dip their tools in the pool and just start with some activities, then move to some green screen activities

> where they are totally creating. So showing them how it can be done. Letting then go see tours and how it can be used during implementation, to see their colleagues and that it was safe to do. My safe schools' assistant would come and let them do that. So number one is doing it together. At the beginning I did have one or two teachers who did not want to use it at all. Then this isn't the place for you. Recognizing that you (teachers) might avoid for a period of time, but not forever, so let's do it together because it's these kids' tool. I call it a "Smoosh model" (The principal demonstrated the forces from both above and below by holding her hands parallel to each other and moving them together until they touched, clapping. (Laughter) So there were teachers that were all excited about it and I was excited about it so we were "Smooshing" everyone together. (personal communication, June 22, 2015)

Challenges for Site Administrators Implementing BYOD.

Establish a culture – love and logic and the team. Principal B on the importance of a school culture,

> One challenge is having a culture, start with your culture. Had I not had the Love and Logic culture it would have been much more difficult. Yes, the philosophy of doing it together. I am not one to, I think it was called Money Ball the Brad Pitt movie with the baseball strategies, to have certain superstars on the team. I don't believe in that philosophy. You win as a team. Everybody has a strength to bring to the team. If you have just one or two super stars it won't fly. So you have to make sure of that. It can create division and it creates inequity for the kids.

> Because they are in luck if they get into that classroom but if they are in another classroom they aren't. (personal communication, June 22, 2015)

Establishing equity for all students. Principal B shares her concern regarding equity,

> There shouldn't be inequity for the kids in access. All kids should have access. So I think that is important. So the teachers need to have the idea that they are going to do it as a family and there is the expectation to use it. (personal communication, June 22, 2015)

Advantages of BYOD for Site Administrators and their Schools.

Allows teachers to differentiate instruction. Principal B has observed that BYOD has many advantages,

> It (BYOD) allows them to differentiate more easily. That is important. It also levels the playing field. I had a little third grade boy who was extended resource, so pretty significant cognitive impairment. We had this app called Sonic Pics where you have three pictures and you kind of drag them into the app, and it creates a mini-slideshow and you talk about each picture. And he came back and he watched the other kids and because the app was so simple and intuitive he did it on his own. He created his presentation and he delivered it to the teacher. That child looked like every other child in that room. That was pretty powerful so all kids are able to feel success. (personal communication, June 22, 2015)

Increases student engagement. Principal B has observed increased levels of engagement with BYOD, "The level of engagement has increased as well. So those are the significant upsides" (personal communication, June 22, 2015).

Increases student access. Principal B discusses BYOD in schools of poverty, "In a school of poverty, the individuals, they are getting their hands on technology. It's part of their world, they are putting the money there" (personal communication, June 22, 2015).

Enhance and individualize student learning. BYOD enhances and individualizes learning states Principal B, "There are so many ways you can use devices to enhance learning, individualize learning. Allow them to bring their own devices" (personal communication, June 22, 2015).

Students have personalized devices. Principal B has observed BYOD facilitates device personalization,

> A lot of times when it is personalized and you own it you know where the stuff is on it. You are much more fluid with it. You know how to navigate it, how to get around. You also know how to take care of it. So I think that is key. (personal communication, June 22, 2015)

BYOD accesses Internet offline applications. Principal B on access,

> If schools can create the infrastructure as far as access the hot spots, routers and access points then the kids can hook on. You don't all need the Internet to do a lot of the activities you can work offline as well. (personal communication, June 22, 2015)

Advice for Administrators Considering BYOD.

Be device agnostic. Principal B advises educators not to focus on the device but to be device agnostic,

> Don't get hung up on the device. Don't marry a device. I will tell you don't look for a device that is a one trick pony. Look for the Swiss army device. You want a device that will do multiple things for you. I think that is important. They change rapidly. The technology is changing so quickly that it is out of date the minute you get it. So be cost effective. (personal communication, June 22, 2015)

Create infrastructure of BYOD access. Principal B prefers BYOD,

> I prefer BYOD and to create the infrastructure of access for how to get on. Allow families to rotate their devices. I think, if I was a really poor district I would spend more on access points, creating the place for kids to get on and then let them bring their own device, because technology is changing so rapidly. (personal communication, June 22, 2015)

Use Love and Logic with adults and students. Principal B shares her philosophy on adoption,

> Be gentle with people as they are learning. There's going to be mistakes with respect to Love and Logic and learn from them. Rarely, rarely is there a mistake that is so huge that you can't recover from it. So be OK with the mistakes. Don't be so hard on yourself. Be safe with a team…. I think we are a society that doesn't like mistakes. I think that it is important that they (teachers and kids), getting back to Love and Logic that they make mistakes, and they learn that it is OK to make mistakes and that you are still going to support them after the mistake. (personal communication, June 22,

2015)

The themes and results for administrator interviews corresponded to the research questions.

Research Questions

What are the district and site administrator's perceptions of and attitudes towards BYOD?

Challenges of BYOD for Administrators.

- Equity for Students without Devices – assuring all students have access
- Establishing a Culture Conducive to Change
- Building Adequate Broadband and Access Point Infrastructure

Advantages of BYOD for Administrators.

- Increased Speed of Technology Implementation
- Increased Number of Students with Devices
- Increased Student Engagement
- Increased Differentiation of Instruction

Advice for Administrators Considering BYOD.

- Be Device Agnostic
- Create Infrastructure of BYOD Access
- Develop a Culture - Use Love and Logic with Adults and Students
- Consider BYOD as a Viable Option
- Establish a Robust Guest Network
- BYOD Puts Tools into the Hands of Students and Teachers

The interview results for educators corresponded to the study questions and included.

What are the educators' perceptions of and attitudes towards BYOD?

BYOD Challenges for Teachers.

- BYOD Requires Teachers to Support a Variety of Devices
- Younger Students' Get Older Less Powerful BYODs as Hand Me Downs
- Getting Families On Board to Participate in BYOD
- Achieving Balance in the Elementary Grade Classroom Hands on Verses Technology

BYOD Advantages for Teachers.

- BYOD Provides Access to Up to Date Information
- BYOD Provides Cost Savings Compared to Textbook Purchase
- BYOD Facilitates Partner Work
- BYOD Sparks Interest and Ownership
- Students Prefer BYOD
- Students Become the Expert on their Own Devices
- BYOD Facilitates the School to Home Connection

Advice for Educators Considering BYOD.

What BYOD classroom management and instructional techniques are used?

Device Management

- Designate Physical Location: desk, backpack, pocket
- School-wide BYOD Policy is Best

- Provide Equity – (Share or provide school devices for students without BYOD)
- Provide Professional Development and or Peer Coach
- Observe Other Teachers
- Communicate with Families via Class Websites, Electronic Newsletter and E-mail
- Train Parents at Back to School Night – (set up device log ins and apps)
- Establish, Teach and Practice Expectations, Procedures at Beginning of Year
- Designate Student IT Managers for Peer Tutoring and Support

Behavior Management

- Teach Character Education – Love and Logic Natural Consequences
- Teach Parents Love and Logic
- Teach Digital Citizenship
- Students Sign Contract
- Monitor Students

Instructional Techniques

- Post Log in Directions on Smartboard or in Student Notebooks
- Start Out with an Easy Task
- Provide Immediate and Individualized Lesson Feedback
- Balance Instruction Technology is a Tool

Summary

The primary research question addressed by this study was, how does the phenomena of a Bring Your Own Device (BYOD) policy instituted at one northwest suburban US elementary school site meet the need to provide increased access, use and integration of mobile technology aligned to the CCSS) and the ISTE Standards?

This study also presents findings to answer the following sub-questions.

- What are the district and site administrator's perceptions of and attitudes towards BYOD?
- What are the educators' perceptions of and attitudes towards BYOD?
- What BYOD classroom management and instructional techniques are used?
- How are the students utilizing BYOD?

What are the district and site administrator's perceptions of and attitudes towards BYOD?

The participating administrator perceptions and attitudes towards BYOD are comprehensive, as they share both the challenges and advantages to implementing this innovative practice. They acknowledge and recommend considering both the pros and cons to ensure success. They both view it from a different perspective but commonalities are evident across several themes including; building physical infrastructure, establishing and maintaining equity, creating a school culture, and noting corresponding changes in teaching pedagogy and student learning by individualizing instruction, increasing student engagement and increasing access to technology for all students.

What are the educators' perceptions of and attitudes towards BYOD?

BYOD challenges for teachers. Challenges reported by teachers include those that involve practice and providing equity, family involvement and instruction as represented by this summary of all teacher responses.

BYOD advantages for teachers. The advantages reported by participating teachers across all three grade spans refer to the advanced capabilities of the devices to access information, provide cost savings, facilitating collaborative practices and students' experiences with technology and the home school communication as indicated from the summary of teacher responses.

What BYOD classroom management and instructional techniques are used?

Device management. All three teachers implement detailed procedures for BYOD and school device management that they pre-taught to their students through demonstration and practice beginning at the start of the school year. They all permitted students to carry and store their devices in their backpacks that were hung in the classroom. They all permitted students to retrieve their BYOD as needed. Teachers did not assume responsibility for the care and storage of devices, this responsibility under Love and Logic principles, was delegated to the students. The fifth grade teacher used peer Information Technology (IT) assistants who she trained and the other teachers implemented a partner technique where students were encouraged and trained to ask their partner or neighbor to assist them before asking the teacher for technical assistance on their devices. The classes all were set up physically to facilitate partner and group work with tables seating from four to six students or desks pushed together to accommodate

groups of students rather than rows of desks. This physical organization resulted in an increased collaboration between students on their devices. Students were not required to be silent during any part of the lessons observed but were encouraged to keep their voice volume down through demonstration and reminders. Students were observed consulting with, collaborating and helping each other on their devices throughout the observations of all three grade levels. The teachers all followed the school-wide device safety measures including; no devices on the floor, no water bottles on the table with devices, and devices were not permitted outside of the classroom at any time and were not to be used during recess. The devices could be charged utilizing the school's chargers or chargers brought in by the students and there were designated spots for this purpose.

Behavior management. Teacher participants in this study and all staff at this school site uniformly implement the school-wide behavior management, character education program Love and Logic, with its focus on student responsibility and natural consequences. Love and Logic is used to train students on the management of devices and also to teach and reinforce behaviors necessary for successful BYOD use. Teachers all report they utilize Love and Logic natural consequences in their classrooms across all situations. The Love and Logic natural consequence observed in the participants' classrooms for inappropriate use of devices is loss of BYOD privileges for various periods of time. The first grade teacher has students who fail to manage their behavior appropriately place their BYOD for a day in the classroom "toy box" the designated spot for any BYOD tool misused as a "toy". The second grade teacher sends the device home in the student's backpack for a predetermined period of time depending upon the severity

of the behavioral infraction. The fifth grade teacher enacted “a one strike you are out policy” where device misuse resulted in the prohibition of BYOD for the student for the remainder of the school year, with no second chances. Teachers and the principal reported that Love and Logic emphasizes problem solving rather than teacher intervention and teachers facilitate student interactions encouraging them to come up with their own solutions if there are behavior issues. No BYOD infractions were reported this year by the participating study teachers.

Instructional techniques corresponding to the CCSS and ISTE Standards. Teachers were observed and reported using BYOD simply as a tool in their toolbox for teaching according to the CCSS. The ISTE Standards were not referred to by any of the participants but the lessons corresponded to these standards. BYOD was used during instruction to augment the devices already available in the classroom. Teachers reported that students prefer their own devices because they can be the “expert”, are more comfortable and the applications and projects created on BYOD can be easily shared providing the school to home communication. BYOD use ranged from individual use to partner or group rotational shared use. BYOD instruction included lessons on device use in the early elementary grades on how to log in with your user name and password and how to access Internet sites and applications. This instruction was evident in the classes observed as the majority of students were able to perform the basic operation of their devices. Teachers provided support for students on logging on by; posting basic log in instructions on the board (fifth grade), displaying detailed instructions including a frame via a document camera and projector (second grade) and providing a folder for each

individual student with step by step directions (first grade). It was noted that the instruction for device use was dependent upon the students' age and varied between the early elementary and late elementary grades.

How are the students utilizing BYOD?

Students utilize BYOD as a tool during class and at home to; complete assignments, review concepts and to practice skills. BYOD tools are used during centers, rotations and independent work. The participating teachers and administrators report examples of BYOD student use including; conducting research online, completing writing assignments, reading stories with myOn Reading, recording audio, taking photos, collaborating with each other on social media including Edmodo and Kid Blog, accessing a variety of educational applications installed on their devices, create graphic arts, take assessments, practice mathematics with, accessing Discovery Education Techbooks and Discovery Education's suite of videos, songs, books, Encyclopedia, Atlas and countless other web resources.

Students use BYOD to augment the number and type of devices made available by the school. In spite of this school's vigorous early adoption of technology through pilots, grants, booster funds and the commitment at both the site and the district level to provide devices one of the classes observed had enough devices for all students to achieve 1-1. Teachers reported they could manage with the devices available by partnering and sharing but if the students needed or wanted to work on an individual device BYOD easily filled that need. Teachers reported some of the school devices were not sufficiently powerful to run some software so BYOD also filled that need.

Students were reported to prefer their own devices if given the choice in fifth-grade because they felt more comfortable and gave them the opportunity to be the experts. The teacher reported, when given the choice they all get out their own devices regularly at the fifth grade level. For example, during the fifth grade "SLAM" science, language arts and mathematics lesson students chose to use their own devices. assignments were posted on clear recipe holders and groups of students rotated through stations where students individually researched topics, accessed various applications on the Internet and wrote biography reports according to the CCSS.

In the second grade class, students partnered on BYOD to create Summer Application booklets in which they wrote about each of the applications posted on the board including the; web address, log in, description and drawing. These would later be sent home for use during the summer months. The first grade teacher incorporated BYOD into a variety of CCSS language arts centers including recording students reading poems, accessing myON Reading to listen to stories and applications but shared her concerns regarding the importance of achieving balance between hands on activities and the use of technology with young students.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of this descriptive case study was to document the phenomena of the practice BYOD policy at one Pacific Northwest suburban elementary school. The purposive selection of participants included three educators one from each of these grade spans: K-first, second-third, fourth-fifth-grades, the principal, and superintendent of the district. Participants responded to an e-mail invitation sent to all teachers at the elementary school and self-selected into the study. These three teachers were surveyed for demographic information. Then they were observed teaching lessons incorporating BYOD. Then the teachers, principal, and district superintendent were interviewed to record their BYOD experiences, perceptions and attitudes, and advice. Evidence is presented to demonstrate that, across all three grade spans (K-1, 2-3 and 4-5) at the northwest suburban elementary school, teachers were observed and reported during interviews that they successfully used BYOD to provide increased access, use, and integration of mobile technology into their CCSS aligned lessons.

Interpretation of the Findings

The findings answer the following research question: How does the phenomena of a BYOD policy instituted at one northwest suburban U.S. elementary school site meet the need to provide increased access, use, and integration of mobile technology aligned to the CCSS and ISTE Standards? These teachers unanimously reported that in spite of having mobile devices in their classrooms, BYOD helped to provide increased access to the technologies needed by students, increased the ratio of mobile devices to students, and

supplemented the number of school devices available in their classrooms. The district superintendent acknowledged BYOD as an effective policy for school district administrators to consider as an intermediate measure in filling the immediate need.

CCSS Key Design Considerations, Anchor Standards, Key Points on ELA in the area of media and technology, and the CCSS ELA standards all require elementary student access to mobile devices to facilitate collaboration, research, and access to and production of digital media. The design and delivery of technology- enhanced educational opportunities for student acquisition of 21st century and workforce skills are becoming the focus of elementary educators as they begin to implement the CCSS. The CCSS integration of media and technology into the curriculum requires schools, districts, and states to consider increased elementary student access to mobile devices and will also facilitate teaching according to the ISTE Standards.

I found that administrators and teachers of the elementary northwest suburban school that was the subject of this study successfully implemented a BYOD strategy. Throughout the interviews, all teachers and administrators claimed that the establishment of a conducive culture is necessary as the foundation for BYOD. This culture is necessary to establish a safe learning environment for both teachers and students where mistakes are an accepted part of the learning curve and that both teachers and students can learn from them. Principal B said, “Start with your culture. Had I not had the Love and Logic culture it would have been much more difficult” (personal communication, June 22, 2015). This Northwest elementary school implemented Love and Logic 14 years ago and

BYOD naturally became a part of the existing system of behavior management and organization rather than a separate policy and system.

In the observed setting, BYOD was an effective way to quickly provide access to technology tools necessary to teach and learn according to the CCSS and ISTE Standards, especially in districts and schools where there are not enough devices to provide 1-1 or the devices available are not powerful enough to be effective tools. The superintendent stated, "I see BYOD as an intermediate step to get as much technology in the classroom as we can" (personal communication, July 20, 2015). This belief was also mirrored in the teacher and principal interviews.

In this district, fears of the educational community and families in regards to cyber bullying, accessing inappropriate content, and misuse of BYOD were ameliorated at the district level through building a robust infrastructure with a separate guest network with log ins and filters in place to block inappropriate contact. At the elementary school site level, it was through establishing school-wide policy, shared with families, that included BYOD expectations, procedures and natural consequences, preteaching and practicing, as well carefully monitoring student BYOD use and applying consistent reinforcement.

BYOD, in the classrooms observed, was used instructionally across a variety of subjects and content areas to teach according to the CCSS in the areas of language arts and mathematics. The findings provide many vignettes illustrating BYOD practices and management techniques in action in the elementary classroom across K-fifth-grades. The participants all pointed to the importance of considering BYOD as a tool in the

elementary educators' and administrators' toolbox. Finally, I found that successful implementation of and the adoption of an AU BYOD policy is feasible at the elementary school level and that BYOD implementation does not need to be restricted to business, secondary education, and junior-senior high schools. Young students at the early elementary levels can use and manage their own devices at school with little intervention from adults once procedures and expectations have been mastered.

The findings of this study do not contradict or support findings of other scholarly, peer-reviewed journal articles specifically on the attitudes, perceptions and practices of BYOD by educators and administrators at the elementary K-5 level in the United States. However, the discussion in the literature review includes information from popular publications including the CCSS and ISTE Standards and the necessity for schools and districts to provide increased access for students to mobile devices in order for elementary teachers to design and implement instruction to enable their students to meet these standards. Both sets of standards address technology-based skills across content areas and require students to access and use technology to search the Internet, design presentations, and write research reports. I present recommendations from educators and administrators in the field who support the feasibility of implementing a BYOD policy to increase access to mobile devices in elementary K-5 classrooms to support acquisition of the CCSS and ISTE Standards.

There is a gap in the literature on the implementation of BYOD policy at the U.S. elementary K-5 level as there is only one peer-reviewed international study and no dissertations on elementary school administrator and teacher attitudes, perceptions, and

practices on BYOD policy to compare the findings of this study to. There is a contrast between mobile device access and use at home by students and mobile device access and use at school. A BYOD policy can increase mobile device use by elementary students at school.

Study Findings and Conceptual Framework

The study findings can be interpreted in the context of and in support of the conceptual framework grounded in Dewey's social transmission theory (1916) and Freire's transformative theory (1980, 1994). Dewey (1916) emphasized that the goal of education was to create a collaborative learning environment. In this study, I demonstrated the goal of creating a collaborative learning environment observed in the classroom observations as students at all grade levels collaborated on projects through the increased use of technology made possible through BYOD access K-12 social networking and collaboration tools like Edmodo and other web 2.0 tools and collaborating face-to-face.

Dewey (1916) proposed that a true democratic society exhibits a commitment to education and associated living and the effectiveness of BYOD has been demonstrated to provide an improved access to technology tools to facilitate the commitment to education and associated living in the elementary classroom.

Freire (1980, 1994) advocated the importance of educators' self-reflection of their own instructional practices. Friere claimed that it is in the act of self-reflection that the teacher advances the cause of the oppressed. Throughout this study self-reflection was

encouraged and facilitated through the interview process and interview observation transcript member checking.

Friere's Transformative Theory (1980, 1994)) advocated an education transformation from a top down dissemination of knowledge, from teacher to student into a more mutual exchange of knowledge and roles. Throughout this study many instances were noted during CCSS based classroom lesson observations, of students empowered through increased access to technology through BYOD to guide their own learning, becoming experts on their own devices, capable of independent research and collaboration with their peers.

Dewey (1819) asserted shared decision making impacts society as it has; economic, cultural, political and educational effects across all socio-economic levels. Collaboration leads to a decentralization of power. These study findings highlight the impact of BYOD on shared decision making as its implementation requires a collaboration between administration, educators and the community.

The Social Transmission Theory of Dewey (1916) and the Transformative Theory of Friere (1980, 1994) emphasize the importance of equity. The study findings support the importance and provision of equity of access to technology for students by increasing the number of devices available for use in the classroom across all elementary grade levels through BYOD.

Limitations of the Study

Robert Yin (2009) defines case study research as "an empirical enquiry that investigates a contemporary phenomenon in depth and within its real-life context". This

study explores the contemporary phenomenon of Bring Your Own Device (BYOD) in the context of implementation at the K-5 elementary school level within its real-life lived experience context from the perspective of administrators and educators. However, there are limitations to case study research evident in any study.

The four tests to establish the quality of a study include trustworthiness, credibility, transferability, confirmability, and dependability according to Yin (2014). To increase construct validity. I used multiple sources of evidence including survey, observation, interview, online resources and documents and established a chain of evidence and provided drafts of the observation and interview transcripts to the participant.

Credibility

Credibility was established through member checking. All study participants were e-mailed transcripts of all interviews and observations and asked to edit by redacting or adding additional information. All participants reviewed the interviews and declined to redact or add any additional information.

Transferability

Transferability is supported by the asking of "how" and "why" questions According to Yin (2014). I designed interview questions for both administrators and educators on the "how" and "why" of BYOD. Transferability of study findings is limited due to the qualitative descriptive case study design's participant selection process so that findings may be most useful to K-5 elementary schools most similar to the demographic characteristics of the elementary school selected however there are findings not specific

to the demographics of the subject school that may inform the field regarding BYOD at the elementary level for administrators nationally and internationally. Findings can also be used to inform and guide further research.

Dependability

The dependability of study findings according to Yin (2014) is the ability of another researcher to replicate the study using the methods specific to this study's qualitative descriptive case study design. This study's dependability is supported by thorough documentation. including identification of the: research questions, purpose, problem, sampling procedure, demographics of the subject school, district and participants and extensive description of data collection methods including; interview and observation protocols, interview questions and methods of data analysis.

Confirmability

Confirmability was established by considering my bias throughout the design and implementation of the research. It was controlled interviews by me asking open ended not leading questions and by not sharing my own attitudes towards BYOD. Confirmability was also established through member checking performed when participants were given the opportunity to share if the interview or observation transcripts were inaccurate due to the bias of the researcher.

Implications

This study has a broad impact in terms of social change with implications across individual, family, organizational, society, and policy domains. In terms of individual and family implications many K-5 elementary students have their own electronic devices

which they are adept at using, yet have not been empowered to use them for the majority of the day during school hours due to restrictive Bring Your Own Device (BYOD) policies. Schools and districts are struggling to implement the CCSS through the use of technology and this study provides practical information to those districts, schools and educators considering the adoption of a less restrictive AUP to allow for BYOD. This study could support their efforts to increase access to technology through BYOD for their young K-5 students. With the potential to change policy at the district and school level this study provides evidence that increased access to technology for K-5 students may be possible at a significantly reduced cost through BYOD. Although the specific findings of this study are generalizable to elementary schools and the districts in which they reside that are demographically similar to the school and district selected for this research, these study findings may have broad social change implications for elementary schools nationwide as they seek resources to meet a dramatic increased demand for technology access.

It provides valuable information to inform the field of education regarding BYOD planning and implementation at the K-5 level to better ensure success. As schools explore ways to fund 1-1 or even 1-2 initiatives, those that consider BYOD as a viable measure can better use existing funding streams to provide devices for those students who do not have them. Equity is an issue so schools implementing BYOD and they should be ready and able to provide devices through their libraries and classrooms for those students who do not have their own. BYOD through its cost savings for schools and districts can improve equity by increasing device access for all students and their teachers.

This study provides evidence of implementation of BYOD at the elementary school level, across grades K-5, that can be used to inform the field about its challenges and advantages. These study findings provide a resource to help to bring about national positive social change by assisting administrators and teachers to increase access to technology for elementary students through the implementation of BYOD policy. This increase in access to technology, in turn, may further facilitate instruction and learning according to the CCSS and the ISTE Standards at the K-5 level in the US.

Recommendations

Study findings include recommendations for K-5 elementary school administrators and teachers considering implementing a BYOD AUP. Through observation and interview study participants including the district superintendent, school principal and three educators share lessons learned on BYOD AUP and implementation from their lived and shared experiences as successful elementary school K-5 early adopters.

Finally, study findings also indicate recommendations for further research on BYOD and related topics.

Build a Robust District Internet Infrastructure for BYOD

According to Superintendent D and Principal B in order to successfully implement a BYOD policy, district and school administrators should first evaluate the existing Internet infrastructure. First steps are to assure that the hardware and software is adequate for the massive influx of use due to BYOD by increasing broadband trunk line capacity and installation of a proxy server. Administrators should not only consider the

potential increased demands on network capacity but also make sure that adequate network security is built in by installing filtering software to block inappropriate sites and searches. Administrators should be mindful that when teachers and students begin to use BYOD there will be a dramatic increase in traffic with multiple concurrent users and a corresponding increase in multi-media application uses like video streaming. Administrators will need to examine these components and seek funding and resources to assure adequate infrastructure that when BYOD is used teachers and students are not frustrated by slow or no connectivity and inability to access streaming content. A separate guest network which requires BYOD users to log in with specific user names and passwords is recommended.

Use Consensus Building Process to Identify BYOD Problems and Solutions

Because the district and school selected for this study were early adopters of BYOD, the process by which they successfully navigated through the issues and problems and their resolution involved a grass roots organic growth of the BYOD practice at the elementary school and sites throughout the district. This early adoption was followed by the convening of a committee made up of administrators and teachers to establish policy. This innovative district Superintendent permitted and encouraged individual principals and teachers in their implementation of BYOD prior to publishing its "official" AUP policy for BYOD.

Districts considering BYOD may find it beneficial to access the most recent publications, unavailable at the time this school and district forged the way as early adopters of BYOD, to identify problems, convene stakeholder groups and to ultimately

identify solutions and come to consensus. On such resource is the book published by the International Society for Technology in Education (ISTE), is *Securing the Connected Classroom* (Brown & Green, 2015) that can be used to facilitate the process districts undertake in consideration of BYOD. This book, and corresponding templates available online, outline a consensus building "Spectrum Process" a term authors coined to describe the process of identifying and describing the problem, creating a working committee, determining the nature of the problem, conducting appropriate research on the problem and coming to a consensus on a resolution.

These activities and recommendations were garnered from the interviews of teachers and administrators who participated in this study and are meant to be regarded as practical information to inform the field regarding their experiences in implementing BYOD from the elementary classroom, school and district levels.

Build Technology Infrastructure

The adequacy of the hardware and network infrastructure at both the district level and individual school levels to handle BYOD traffic was a concern expressed and addressed by both administrators, Superintendent D and Principal B. They report that the potential for the increased demand on the network requires increased bandwidth to carry media rich content back and forth and is a prime consideration. Trunk lines in and out of the district office to school sites must be adequate and bandwidth must be robust enough to carry increased volume of student traffic as well an increased use of multi-media rich streaming content now required by many of the newer applications and sites. Both administrators report that the adoption of BYOD requires the district and schools to

carefully evaluate the number of existing access points and routers at school sites that enable individual teaches and students to access network and Internet based content and assure they are adequate. Both administrators refer to the access by BYOD users to the district "guest network" and built in filters as instrumental in separating BYOD users from accessing district administrative and teacher networked content including attendance, grades and assessment data etc. and preventing students from accessing inappropriate content. The magnitude of potential BYOD use, necessitates an evaluation of and changes to the configuration of the technology infrastructure because they access the network concurrently instead of one class at a time, as when students are in a computer lab or sharing sets of lap-tops. According to both administrators, IT departments need to address these concerns of adequacy of broadband, routers and access points and configuring the network to prevent student access to district and inappropriate content prior to implementation. The administrators, interviewed for this study, stated these are the primary areas of challenge to technology infrastructure and outline these possible changes necessary to meet the immediate requirements for BYOD traffic on a district network and at the individual school-site level.

Convene BYOD Committee with Administrator, Teacher, Family and Community Members

In order to establish and adopt a large scale BYOD initiative at the district level, it was reported by Superintendent D that it proved to be effective for them to convene a committee of stakeholders to examine and resolve any issues that might be of concern from staff and community members. This district committee used a committee approach

to establish their district-wide AUP policy governing BYOD and technology use throughout the district. Since this district's early adoption of BYOD, the book entitled, *Securing the Connected Classroom Technology Planning to Keep Students Safe* has been published. In this book Brown and Green, (2015) provide a valuable resource for districts to use to organize the AUP development process that this district did not have at the time of their BYOD initiative. The book supports decision makers in the adoption process with its step by step "spectrum process" by which districts can recruit and support a stakeholder group. Along with the templates provided online, this book can be used to guide administrators through the process of problem identification, consensus building and decision making in regards to the potential issues broad scale technology initiatives like BYOD present. Administrative participants advise that a School-wide BYOD Policy is best. And that schools and districts should be prepared to provide equity by instituting sharing or providing school devices for students without their own devices.

BYOD Character Education, Behavior and Classroom Management

Schools should adopt a character and behavior management system like Love and Logic prior to implementing a BYOD AUP to prepare students for appropriate technology use in the classroom. It should not be a separate policy but integrated into the existing system. Teachers should pre-teach to prepare for BYOD with lessons on; logging on, device management, use and storage, charging stations, bookmarking sites, digital citizenship, cyberbullying and Internet safety. Designate the physical location for devices including where and when it is appropriate to use them a; desk, backpack, purse or a pocket. Teachers of upper grade students can designate Student IT Managers for peer

tutoring and support. Establish, teach and practice expectations and procedures at the beginning of and throughout the school year.

BYOD Communication, Community and Family Engagement

Develop communication with families and the community including signing the AUP, delivering training at live events including Back to School Night and virtually on teacher and district websites and finally through written communications, classroom newsletters and e-mail.

BYOD Professional Development and Support

Develop and support professional development for educators through peer coaching/mentoring, classroom visits and observations of peers, Professional Learning Communities (PLC), technology fairs and live events in addition to providing virtual on demand training via online district supported resources.

BYOD Instructional Techniques

Teachers should provide immediate and individualized lesson feedback while students are actively engaged in lessons utilizing BYOD. Educators should balance Instruction and emphasize technology as a tool to support CCSS based lessons not a separate topic of instruction.

Recommendations for Further Research

The findings of this study can be used to answer the research question and sub questions, but as in all research the need for further areas of inquiry are obvious, one set of questions leads the investigator deeper as new questions present themselves.

Further investigation in the area of pedagogy and instructional design specific to the unique opportunities BYOD presents would be useful to the field, especially in the areas of utilizing BYOD to teach according to the CCSS, ISTE Standards and its capacity to provide personalized learning experiences. With BYOD's potential to track student learning and present adaptive learning activities specifically designed for the individual student's level of achievement both at school and at home BYOD is in its infancy.

BYOD also may have the unique potential to engage and develop distinct school to home connections via the use of; video in the classroom to document learning and activities, involving families in social media for example Edmodo, Kid Blog and other forms of communication. School to home connections, as facilitated with BYOD, has not been the topic of peer review research.

Professional development specific to BYOD was expressed as a need by teachers and administrators participating in this study. Research on the perceived effectiveness of various delivery systems for professional development, for example SAMR mentioned by the principal of the school in this study, and their effect on BYOD would be informative and helpful for administrators planning professional development on BYOD. One such study done as a doctoral dissertation entitled, iEngage, iEducate, and iEmpower (Otstot, 2015) outlined a peer mentoring program that was successful in providing support for BYOD implementation. Research on other types and models of professional development specifically implemented for BYOD would be very useful and may lead to faster adoption and more effective practices by districts and schools as they move towards BYOD.

Quantitative research comparing practice session scores on the CCSS assessment for students whose teachers regularly use BYOD compared to those students who do not use it was not collected during this study. Assessment data would be helpful to determine and document just how critical the use of technology is in developing the CCSS standards based lessons and improving the scores on the skills assessed.

US elementary student attitudes, experiences and beliefs regarding BYOD have not been documented through peer reviewed research or this study and would provide insight for the field into ways students interact with technology and the methodology that teachers and schools might utilize BYOD in accordance with their needs.

Differences in the implementation, organization and management of BYOD are evident across different elementary grade levels as documented through this study. Further research into effective management practices across teachers of various grade levels in communities of BYOD practice across schools and districts would provide the field with further research based best BYOD practices.

A mixed methods survey of institutions of higher education on teacher prep programs and whether or not they include BYOD, to what extent and content of these courses would provide data to support extensive training for professors and correspondingly for their students on BYOD at the higher education level. This research would help institutions of higher education to better prepare preservice teachers for implementing the growing phenomena of BYOD.

Preservice teachers who receive training in BYOD practices as part of their teacher preparation could be followed in a longitudinal study to determine how they use

and the extent to which they use BYOD on the job and how their higher education training impacts the schools and students they serve upon graduation.

Further Quantitative studies of BYOD behavior and device management including the collection of office referrals, tallies of classroom incidents etc. would help to document the incidence of inappropriate use and may allay fears of school boards, district and school administrators, families and teachers by providing data on effective techniques used to reinforce appropriate behavior and device management expectations.

Conclusion

Why are elementary K-5 students unable to bring their own devices to school? Historically districts, schools and teachers have struggled with restrictive Acceptable Use Policies (AUPs) that prevent the practice of Bring Your Own Device (BYOD). Educators, administrators and families have historically been concerned about misuse including accessing inappropriate sites, cyberbullying, equity issues, professional development, management and access.

The data presented in this study described the early adoption of a BYOD policy at one northwest suburban elementary K-5 school and supports the idea that adoption of BYOD at the elementary school level is a feasible option worth considering by elementary teachers and their administrators. This study documents the effective instructional practices and behavior and device management techniques successfully used to implement BYOD at this elementary school and vignettes of CCSS based instruction that incorporates BYOD. This study provides support for the assertion that elementary students can bring and use their own devices appropriately across a variety of educational

settings and assignments. This study can be used by the field to inform BYOD decision makers and teacher practices.

Study findings support the feasibility of implementing an elementary K-5 BYOD AUP. Findings explore practical data based information gathered via interviews and observations of a Pacific Northwest suburban elementary K-5 school through a purposive selection of administrators and educators to document their lived experiences, attitudes and beliefs regarding their BYOD AUP and practices. Findings from this study begin with district and site considerations including building a robust network and infrastructure as essential prerequisites prior to considering an elementary K-5 BYOD AUP implementation. Infrastructure considerations also include determination of adequate bandwidth, broadband trunk line capacity, proxy server, number and placement of routers, access points, installation of filtering software and the establishment of a separate guest network for students' use to accommodate increased media rich traffic. In addition, study findings address the importance of laying the foundation for BYOD at the K-5 elementary school level by convening a BYOD committee with administrator, teacher, family and community member representation to address concerns and questions. Establish a BYOD district and elementary school AUP and Agreement requiring a signature for all stakeholders including district and school staff, the community and students, establishes expectations, guidelines, rules for use and the consequences for misuse to facilitate elementary school BYOD implementation. Publishing the BYOD AUP on district, school and teacher websites provides easy access to the AUP for all stakeholders. Requiring a family signature on AUP agreements ensures understanding

and commitment on the part of the family. Findings indicate family communication and preparation for elementary school implementation of BYOD are important to ensure buy in and success.

The district and elementary school can share information on BYOD and the AUP at school registration, Back to School Night or any live family event. According to study findings, a best practice to ensure information is disseminated to the community, is for teachers to establish elementary classroom websites and to share information on BYOD on these websites and through classroom newsletters.

Findings indicate all stakeholders agree it is important to conduct professional development on BYOD to prepare elementary educators for implementation and to share best practices. Virtual 24/7 web resources provide one way to deliver professional development on demand. Other avenues for the provision of professional development include hosting a district or site tech fair, providing release time for teachers to visit BYOD practitioners' classrooms, conducting tours for educators at sites implementing BYOD and provide on-site support.

Districts and elementary schools should be prepared to provide equity by providing school devices for those students who do not bring their own devices. Study findings indicate the importance of elementary school adoption and implementation of behavior and classroom management and character education programs for example Love and Logic in preparation for and to facilitate BYOD.

In addition, findings address the importance of setting up and directly teaching Internet safety and citizenship, device management systems, procedures and expectations

at the beginning of the school year to elementary school students as essential knowledge for BYOD success. Direct instruction could include the following topics defining appropriate use and location of devices, setting up charging stations, posting log in directions, and bookmarking appropriate sites. Study findings also illustrate effective instructional practices incorporating BYOD practice into CCSS lessons at the K-5 elementary school level.

Study findings provide evidence that a BYOD policy at the elementary school K-5 level is a feasible option for district and school consideration for increasing student access to technologies necessary to learn according to the CCSS and ISTE Standards.

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Appendix A: Study Invitation Consent E-mail

Invitation to Participate E-mail Letter to Educators

Dear Educator,

I am a PhD student at Walden University and have been approved to conduct a study for my dissertation entitled, *A Study of the Application of a Bring Your Own Device (BYOD) Strategy in an Elementary School*. This study will document educators' and administrators' attitudes, beliefs and classroom practices of BYOD at the elementary school level.

This is an invitation for you to participate, as you have been identified as a K-5 general education educator teaching at Star Elementary School.

Participation - Participation will consist of one interview conducted either before or after school prior to the study at your convenience and one observation of you teaching a lesson where students are using their own devices (BYOD) and finally a short exit interview. I will be considerate of your time and will schedule all three at your convenience via e-mail. The final activity will be a review of a summary of the data and results assure they are correct. This will allow you to provide input prior to publication. Please refer to the table below for a summary of activities.

Benefit - This study is meant to not only inform the field about the practice of BYOD at your site, but will facilitate self-reflection by participants and professional development as you will have the opportunity to learn about current research and popular literature on BYOD and through reading a summary of study outcomes.

Because this study involves at least two hours of your time external to your school day all study participants who complete all of the study activities listed below will receive an Amazon gift certificate for $75 as a thank you.

Confidentiality – All K-5 educators at your site are invited to participate as potential applicants. One representative from each of the three grade spans K-1, 2-3 and 4-5 will be selected from the pool of potential applicants. Your identity will be kept confidential and known only to me, as you will not be identified by name but by an assigned name throughout the research process and in the dissertation itself. Your interview responses and observation will also be kept confidential in the sense that they will not be associated with your name and all materials will be stored via password protected files. Your identity will not be shared with anyone at the school or district level including administrators or in the final published dissertation. Your participation will not affect or be a part of your school district evaluation. You may choose to exit the study at any time should you change your mind about participation.

"This research is not sponsored by or initiated by the school (Star Elementary) or by the district (Ada School District).

This table presents an overview of the activities. You will see that the time commitment is not overwhelming and the study is designed to accommodate your participation.

Study Activities and Time Commitment

Read and respond to this invitation to participate in the study. –	**10 min.**	**Virtual**

E-mail		
Online Survey Monkey – demographic information collection	**5 min.**	**Virtual**
Individual Scheduling of Study Interviews with all participants – E-mail	**3-5 min.**	**Virtual**
Individual Prior to Study Interview– Live before or afterschool (Scheduled at your convenience)	**30 – 45 min.**	**School Site**
Schedule Observation of Lesson - E-mail – Phone	**3-5 min.**	**Virtual**
Classroom Observation of Lesson – Live during the school day (Scheduled at your convenience)	**45-60 min.**	**School Site**
Post Study Exit – Review of an e-mailed interview and observation transcripts summary of study outcomes with all participants for member checking purposes. (Scheduled at your convenience) Note: Complete dissertation provided upon request	**30-45 min.**	**Virtual and School Site**

Please Check and return this form to my e-mail address.

___**Yes** I would like to participate in this study.

Please click on this link to a very brief demographic survey below.

___**No** I would prefer not to participate in this study. Please respond via e-mail.

*Please respond by (one week from delivery date of e-mail). I will notify all potential participants within one week individually via e-mail.

I am looking forward to meeting with you and working with you on this important study!

Please feel free to call my cell at 899-1534 or e-mail me at carol.scholz@waldenu.edu if you have any questions or would like to discuss participation.

With Warm Regards,

Carol

Carol L. Scholz M.Ed.
Walden University PhD Student
Cell (208)899-1534
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Appendix B: Interview Questions Educator

Interview Questions for Educators

Questions for educators include but are not exclusive;

1. Describe your teaching assignment and students.
2. Describe the training and support you have received on BYOD.
3. Describe your experience implementing BYOD?
4. How do you organize your classroom to facilitate BYOD?
5. How do you physically manage BYOD devices?
6. How do you communicate with parents regarding BYOD?
7. How do you integrate BYOD into the curriculum?
8. How do you use the BYOD policy to facilitate the Common Core?
9. How do you provide equity for students without devices when implementing the BYOD policy?
10. How do you prevent inappropriate use, cyberbullying and accessing inappropriate content while using BYOD?
11. What character education, school and classroom rules and or disciplinary actions are in place to facilitate BYOD?
12. What are your perceptions regarding BYOD implementation in your classroom?
13. What are the challenges of BYOD?
14. What are the advantages of BYOD?
15. What advice can you give to other educators considering BYOD?

Appendix C: Interview Questions Site Administrator (Principal)

Interview Questions for Site Administrator - Principal

Questions include but are not exclusive to the following;

1. Describe your background and experience.
2. Describe your school and the demographics of your students.
3. Describe the timeline of events and activities that lead to the adoption of a BYOD policy at this school site?
4. What is your AUP?
5. Is this a district-wide or site specific policy?
6. How do you communicate with parents and students regarding the BYOD policy?
7. What is the technology infrastructure, including access points, network, hardware and software that facilitates BYOD at your particular site?
8. What support, training and information is provided to educators on BYOD?
9. What information on BYOD is provided to families?
10. Describe your experiences with teachers and students using BYOD at your school.
11. What are the challenges of BYOD?
12. What are the advantages of BYOD?
13. What advice can you give to other administrators considering BYOD?

Appendix D: Interview Questions District Administrator (Superintendent)

Interview Questions for District Administrator - Superintendent

Questions include but are not exclusive to the following;

1. Describe your background and experience
2. Describe your district and demographics.
3. Describe the timeline of events and activities that lead to the adoption of a BYOD policy at the district level that permits BYOD?
4. What is your District AUP?
5. Is this a district-wide or site specific policy?
6. How does your district communicate regarding the BYOD policy?
7. What is the technology infrastructure, including access points, network, hardware and software that facilitates BYOD in your district?
8. What support, training and information is provided to educators on BYOD and or your AUP?
9. What information on BYOD is provided to families on BYOD and or your AUP?
10. Describe your experiences with teachers and students utilizing BYOD in your district.
11. What are the challenges of BYOD?
12. What are the advantages of BYOD?
13. What advice can you give to other district administrators and superintendents considering BYOD?

Appendix E: Observation Protocol

Observation Guide Protocol

Classroom Observation of Elementary Educators Teaching Lessons Utilizing BYOD

Scheduling Observations - Three elementary school educators at the elementary school will be invited, via e-mail, to share their teaching practices utilizing BYOD by scheduling a 30-60 min. observation of a lesson of their choice on a day/time of their choice.

Location of Observations - The location will be thee participating educator's elementary school classrooms at the elementary School in the Whitfield School District.

Population Observed - The three K-5 educators at star elementary school who comprise the convenience sample, self-select into the study and agree to a classroom lesson observation will be the population observed. The observation will focus upon the educator delivering the lesson although the interactions between the educator and students will be recorded.

Content of Observation - The Elementary K-5 classroom teachers who self-select as participants will be observed teaching a lesson of their design where students are permitted to use their own BYOD during the observed lesson. The observation can be of any academic lesson of the educator's choice including a lesson from the following curricular areas; language arts, mathematics, science or social studies.

Method of Recording Observation - A digital auditory recording device will record all teacher student interactions during the observed lesson. Field notes documenting the observation and written by the researcher will be continuously taken throughout the

observation on a lap top by the researcher. The field notes will be kept in a locked file cabinet and or saved to a secure password protected file on my laptop and Google. No one other than the researcher and the dissertation committee members will have access to the raw data. The administrators will not have access to the transcripts without the written permission of the participant.

Method of Transcribing Observation - The classroom lesson interactions between the teachers and their students will be transcribed into a word processor and or other software in order to later facilitate coding and analysis by the researcher. These raw data and coded files will be saved to a secure password protected file on Google. These files will not be shared with anyone other than the researcher's dissertation committee members including site and district administrators without the written consent of the participant.

Review/Member Checking of Observation Transcript - Once the observation of the lesson has been transcribed it becomes part of the official data collected throughout the study. Participants will be given a copy of their own observation transcripts and outcomes in the form of a Word document via email. They will then have the opportunity to perform member checking of all of the transcripts of their observations, coding and study outcomes as they pertain to their individual classroom observation prior to publication.

Appendix G: Technology Page Snapshot

Teacher Toolbox for Learning on District Website

Appendix H: School District BYOD Acceptable Use Policy (AUP)

School District

Bring Your Own Device (BYOD) Program

September 2014

Bring Your Own Device (BYOD) Program

BYOD Guide August 2014

PURPOSE

School district is committed to preparing all students and teachers to maximize learning by fully integrating relevant technology into the academic content so students will be able to:

- Acquire, share, evaluate and create digital information
- Achieve media and technology literacy
- Maintain a safe and ethical online environment

As part of this commitment, the District has wireless capabilities in all school buildings that will allow student owned devices to be used in a classroom setting to support instruction. With classroom teacher approval, students may use their own devices in the classroom to access, interact and save information from the Internet, communicate with other learners and use web productivity tools to create assignments/projects and/or take classroom assessments. State/District mandated tests must be taken on district devices.

ACCESS

Access to the Internet is provided via a guest network called GUEST which is part of the wireless local area network. When students use this network they will be expected to uphold all district network policies (Policy No. 1001.30 and the Parent-Student Handbook). Additionally, in compliance with the Children's Internet Protection Act (CIPS). School District will filter all content for users connected to the GUEST network.

THEFT, LOSS OR DAMAGE

School District or any employee of the district is not liable or responsible for any theft, damage or loss of any non-district device or the information on any such device. It is the responsibility of the owner of the device to ensure that the device is safe and secure.

ELECTRONIC DEVICES POLICY

Students will use electronic communication or data devices only in a manner consistent with instructional and testing activities in the classroom. These devices include, but are not limited to, handheld calculators, PDA's, pagers, cell phones, music playing devices, one-to-one computing devices, cameras, and laptop computers. Use of these devices must not violate any district policy or cause classroom disruption nor may they be used in the access, creation, or possession of inappropriate materials (i.e. pornography). Use of electronic devices in the classroom is at the discretion of the teacher and/or building administrator. Use of electronic devices outside of the classroom is at the discretion of the building principal. Parents or students who bring any electronic device to school or to a school

activity do so at their own risk – [redacted] School District and its schools assume no liability for damage, theft, etc. Videotaping or taking pictures is prohibited on district property (including buses) unless approved by building administration. If the policies are violated, administrators will determine consequences based on the severity of the incident. Additionally, on the first offense the device may be confiscated until a parent/guardian retrieves it from the front office/administration.

TEXTING- PERSONAL INTERNET USAGE FEES

[redacted]chool District is not responsible for any fees associated with using any personal technology devices. All fees and charges related to texting or Internet use on any student- owned device is the sole responsibility of the owner.

Frequently Asked Questions

Do I need to have anti-virus software on my personal device?

Yes. Students should update their anti-virus software before bringing their device(s) onto school property

Do I have to register my laptop, smart phone, or other devices with school administrators or teachers?

No. You are responsible for your own technology. However, remember that it is completely up to the School Building Administrator or classroom teacher as to whether you can use your technology. Classroom technology usage may change on a daily basis.

How do I connect/login to the internet?

- On your device:
- Select School Name-Guest network
- Open a web browser, i.e. Chrome, Internet Explorer and try to load any webpage
- You will be directed to a login screen
- Enter **Guest**
- Enter **Daily password**

If I cannot get connected to the Guest network, who do I call?

Support for student-owned devices is the **responsibility of the owner**. [redacted] Staff is not responsible for technical issues. Also, there may be someone in your class who can help. In the settings menu of your device, there is usually an icon for a network. Go to this icon and select Guest from the list of networks to join. Always consult your device's owner's manual or "help" menu for exact directions on how to access a wireless network.

Can I access Facebook, Twitter or You Tube on my device?

Connectivity to the wireless network is just like connecting to the District network when it comes to sites you may access. It is important to remember that even though you are using your personal technology, you must comply with all district policies and procedures.

Can I use my device in all of my classes?

That is solely up to the teacher in each of your classes.

How do I save my work?

You can use a flash drive, cloud based storage or send a document to yourself via email. The district is not responsible for backing up files.

Can I print from my own device?

No. There is no printing allowed from student-owned devices. If you need to print, it is recommended that you email the document to yourself or save it on a flash drive, then login on a District owned device to retrieve and print.

What do I do if my device is stolen or damaged?

It is the responsibility of the owner to keep his/her personal technology safe and secure. Anytime there is a theft or damage, you should notify your teacher and/or school building administration and your local law enforcement. The district, or any of its employees, are not responsible for the theft, loss or damage to your personal device.

It is recommended that you have the serial number and MAC address of the device stored at home in a safe place in the event you may have to report loss or theft.

Will I be able to charge my battery at school?

There are a limited number of outlets dedicated to charging personal devices. Students should charge their device prior to coming to school each day. At no time should a student leave devices unattended while being charged.

Am I still held accountable for Parent-Student handbook policies that my parents and I sign at the beginning of the school year even though this is my own personal device?

Yes. Your signed agreement remains in effect even when you are using your own laptop, cell phone, iPad, iPod touch, etc. Each time you attempt to access the network at school you are expected to abide by [redacted] School District policies. Violating the Terms and Conditions of the policies would be a behavior violation and would be dealt with by a school building administrator.

If a student uses their own technology at school, will they be able to access things they normally do not when using District technology?

Anyone connected to the District wireless network will be filtered in the same way as using District-owned technology

Since the District is promoting BYOD, does that mean I have to purchase a laptop or smartphone or another technology device?

No. The District is simply allowing those students who have the technology the option to bring it to school with permission of the teacher (s) to be used for instructional purposes. This will allow more technology in the school and classroom than currently exists.

All students will continue to be able to utilize our school equipment. No student will be left out of the instructional process.

What are the building/classroom rules for using student-owned devices including phones?

Teachers make the final decisions for any technology used in their classrooms, student-owned devices would be no different. It will be up to the individual classroom teachers to communicate the ir expectations to the students and parents. Feel free to contact your child's teacher(s) or school building administrator for his/her expectations.

Does the District have policies for technology use?

Yes. The policy for technology use can be found in the Student Handbook. This policy is called the Computer/Network Use and Conduct Policy.

Are there specific device specifications I should consider when purchasing a new device?

Wireless N Wireless (preferred) or AC
Keyboard suggested
Java/Flash capable
6 hour battery life or better

Are there things to consider when purchasing a device?

Many websites require Flash and/ or Java- a device that allows Flash and Java would be preferred- some educational websites require flash and Java to run.
A device that has a larger screen and a keyboard will help students be more productive. With new Common Core Standards students have to write much more and need to have a keyboard and a large enough screen to produce and create items like papers and presentations for their classes.

What is recommended if a students does not have a personal device to use in the classroom?
Any student who does not own a device may use district owned technology at school. (i.e. library technology, labs, etc.).

If students have trouble connecting to the BYOD network or using their own technology, is it up to the teacher to help?

No. Students that experience trouble with their personal devices should try to troubleshoot using their user's manuals or "Help" menus on their own. District staff members are not responsible or expected to

provide support for student owned devices. It is the student's responsibility to ensure that their technology device is functioning properly.

If students use their own technology, will they be able to get to sites that are not allowed in school?

No. Anyone connecting to the GUEST network will be filtered as they would using District-owned devices.

Strategies to suggest to users to unable to access the GUEST network

Verify that you have selected the GUEST network
Verify CAPS lock is not on when entering password
Try another browser like Google Chrome, Internet Explorer, Firefox, etc.
Once in a browser, attempt to enter a web address and press "Enter"
Reboot your computer and/or device and try again.
If you are not getting on the network, try another device, see if anyone else is having issues before reporting to a staff member.

Appendix: I BYOD Permission Slip

Bring Your Own Device

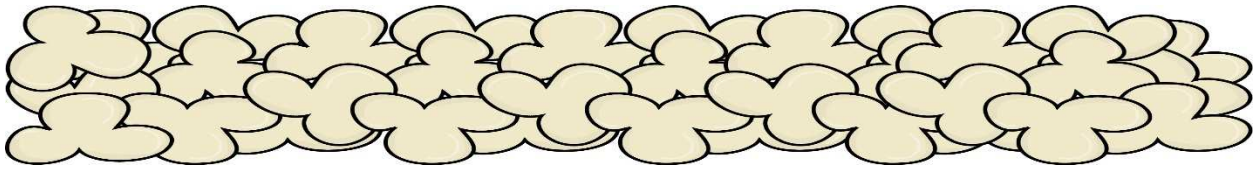
I have read and reviewed the School District policy for students bringing their own devices to school.

____I give my student permission to participate in this program and bring their device to school.

____ I would like to opt out of this program at this time.

Student Name: _____

Parent Signature: _____



Appendix J: Copy of Love and Logic Flyer

Love and Logic®

LOVE AND LOGIC STRATEGIES FOR CREATING SELF-DISCIPLINED, HIGH ACHIEVING KIDS WITH JIM FAY & DR. CHARLES FAY

NAMPA, ID APRIL 17, 2014

It's no secret that self-disciplined kids do better in school, score higher on College Aptitude Tests, and go on to lead more fulfilling lives.

For over 35 years, the Love and Logic Institute has been recognized as the trusted leader in the area of helping parents, educators, and counselors learn the secrets to raising kids who are self-regulating and fun to work with.

Join the legendary Jim Fay and Dr. Charles Fay as they weave storytelling with practical solutions that will change your life. At this fun-filled event, you will learn:

- Simple and practical techniques to raise self-disciplined kids.
- Time-tested strategies for avoiding power-struggles at home and in the classroom.
- Tips for guiding kids to think creatively and solve their own problems.
- How to discipline without losing their love and respect.
- Strategies for raising achievement on Common Core Standards.
- How to put the joy into teaching and parenting.

100% Satisfaction Guaranteed

EVENT INFORMATION

Presenters: Jim Fay & Dr. Charles Fay
Location: Nampa Civic Center
311 3rd Street S
Nampa, ID 83651
Date: Thursday, April 17, 2014
Time: 8:30 A.M. - 2:30 P.M.
Event Cost: $99.00
(payable to Love and Logic Institute)

HOW TO REGISTER

Mail form to:
Love and Logic Institute, Inc.
2207 Jackson Street
Golden, CO 80401-2300
By phone:
800-338-4065
Online:
www.loveandlogic.com
By fax:
800-455-7557

GRADUATE-LEVEL CREDIT AND CEUs

Graduate-level Credit: One semester credit hour
Offered by: Brandman University
Credit Cost: $95.00 (payable to Brandman University)

Continuing Education Credit Offered:
5 clock hours (0.5 CEUs)
CEU Cost: $15.00 (payable to Love and Logic Institute)
Love and Logic is an NBCC-Approved Continuing Education Provider (ACEP™) and may offer NBCC-approved clock hours for events that meet NBCC requirements. The ACEP solely is responsible for all aspects of the program.

Forms describing the graduate-level credit process and CEUs will be available at this event. For more information, please call 800-338-4065.

HELPING RAISE RESPONSIBLE KIDS SINCE 1977™

April 17, 2014 Event Registration Nampa, ID

Attendee Information
Name ______
Day Phone ______ Email ______
Address ______ City ______ State ______ Zip ______
☐ I would like to receive Love and Logic's FREE Insider's Club weekly email tips.

Billing Information (Leave blank if same as attendee information.)
Organization ______
Billing Contact ______
Day Phone ______
Address ______ City ______ State ______ Zip ______

Payment Method ☐ Event $99.00 ☐ CEU $15.00
☐ Check (Attached, payable to Love and Logic Institute, Inc.)
☐ Visa ☐ Mastercard ☐ Discover ☐ American Express ☐ Purchase Order (Attached)
Card Number ______ Exp. Date ______ Validation Code ______
Amount ______ Signature ______